Epidemic Intelligence Service

Final EIS Assignments

EIS Class of 2019

April 2019

2019 EIS Assignment Page

Center for Global Health

The Center for Global Health (CGH) provides leadership within CDC and works with partners around the globe to "Help CDC Help the World." CDC is a leader in promoting public health for all people, protecting the United States and the world from health threats, and working with global partners to realize the goal of "Healthy People in a Healthy World—through Prevention." CGH works with partners to prevent and control infectious and chronic diseases; respond to international disasters; and build sustainable global public health capacity by training epidemiologists, laboratory scientists, and public health managers. Organizationally, CGH is comprised of four divisions: (1) the Division of Global Health Protection, (2) the Division of Global HIV/AIDS and Tuberculosis, (3) the Division of Parasitic Diseases and Malaria, and (4) the Global Immunization Division. Exceptional training opportunities exist for EIS officers within each of the CGH divisions.

CGH-DGHP-EISLB-Georgia-2019-01

Primary Supervisor: Carol Rao, Epidemiology Team Lead, EIS 2005

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Secondary Supervisor(s):

- Olga Henao, Branch Chief
- Terrence Lo, Epidemiologist, EIS 2011

Background: The Epidemiology, Informatics, Laboratory, and Surveillance Branch (EISLB) in the Division of Global Health Protection/Center for Global Health, promotes scientific discovery by partnering with host countries to identify new health threats and reduce the burden of infectious diseases. The Epidemiology team focuses on the development and implementation of studies and surveillance activities needed to characterize and track the burden of infectious diseases, identify populations at risk, and describe the risk factors at play to generate the information needed to develop interventions. The branch actively engages with the Global Disease Detection Operations Center, which monitors and responds to public health events of international importance and emerging disease threats, and with CDC's One Health Office, as well as many other subject matter experts across CDC, to enhance our multisectoral One Health collaborations and human-animal interface projects. A hallmark of our work is the strong interaction and collaboration for the development of studies and activities with multiple subject matter experts across CDC. This ongoing collaborative work provides a great opportunity to engage with other groups both domestically and internationally throughout the agency.

Current Work: Acute Febrile Illness Surveillance (Kenya) evaluation; CDC technical lead on the Lassa Fever Control and Response Plan for Liberia; Lead analyst for Yellow Fever in Nigeria for GDD operations center; Successes and Barriers to Rabies Prevention and Control Activities in CDC-Supported Countries Survey; One Health surveillance evaluation tool Landscape analysis

Proposed Initial Projects: The surveillance systems that could be evaluated are ongoing, multi-year projects. The EISO would begin by reviewing all of the protocols and SOPs to formulate an evaluation plan to be reviewed/approved by the in-country staff and implementing partners before an in-country visit. The data for the proposed analytic projects have already been collected and are currently undergoing data entry and cleaning. Data analysis and report writing could begin within the first month.

Proposed Analytic Project:

Numerous surveillance and study datasets are available for analyses from ongoing acute febrile illness surveillance, zoonotic disease surveillance, and applied public health research projects in countries. Protocols have already been developed and approved. Data collection is either completed or nearing completion. Examples include (1) Multivariable logistic regression to assess risk factors for maternal Zika virus infection during pregnancy from pregnancy cohort studies in Guatemala, Kenya, and Thailand. (2) Evaluation (e.g., diagnostic odds ratios, correlation coefficients) of the performance and usefulness of novel diagnostics for Zika, chikungunya, dengue, and other infections among patients recruited through acute febrile illness surveillance platforms in Guatemala, Haiti, India, Kenya, Peru, South Africa, and Thailand. (3) Logistic regression analysis to

identify secondary causes or risk factors for severe neurological complications in a population with high endemicity of arboviral disease in Peru (4) Logistic regression analysis to evaluate risk factors for Zika infection on a nationally representative sample of ~2000 women of reproductive age in Guatemala (5) Geospatial analysis to examine national distribution of Zika infection among women of reproductive age in Guatemala (6) Cost-benefit analysis of the impact and direct medical care costs of hospital-acquired infections and antimicrobial resistance in Georgia.

Proposed Field Investigation Project:

DGHP is funding bilateral research cooperative agreements in multiple countries (e.g., Vietnam, Nigeria, Indonesia, Kenya, Senegal) for research activities in FY20 (October 2019--September 2020). These are newly funded research studies with varied objectives depending upon the partner and the country. An incoming EISO will work with the CDC Headquarters/in-country staff and MOHs to develop protocols to collect and analyze data to answer research questions on infectious disease surveillance, burden of disease, disease distribution, and/or risk factors for certain infectious diseases (e.g., Comparing risk factors for acute febrile illnesses-causing pathogens across population-based surveillance platforms in Belize, Dominican Republic and Guatemala; Conducting a national seroprevalence survey for Dengue infections in Senegal; Identifying etiologies of bloody diarrhea in Senegal). The expectation would be that an EISO assigned to CGH/DGHP would be involved with international outbreaks as part of their assignment. If a domestic outbreak or emergency response occurs, we would support the EISO in participating in Epi-Aids and other deployments. Daniel Rhee ('15) participated in the 2016 Zika outbreak international response, both in the EOC and in the field (e.g., implementing Zika pregnancy cohort studies), and the 2016 Elizabethkingia anopheles outbreak in Wisconsin. Nailah Smith ('18) traveled to Liberia in 2019 to collect and interpret data on Lassa Fever outbreaks and to provide recommendations to the Liberian MOH.

The EIS officer will work with governmental and research partners in multiple countries and, alongside other branch staff, provide technical expertise and assistance in establishment and evaluation of surveillance activities, applied epidemiological research and analytic studies, capacity building, design and deployment of public health interventions, and outbreak investigations for infectious diseases and other health priorities. For example, our EISOs have rotated as analysts through the GDD operations center at CDC and WHO, to gain experience in managing an international yellow fever outbreak and other public health events of international concern. EISOs are the project epidemiologists who work with the in-country CDC staff, the ministries of health (and/or other relevant ministries or implementing partners) to conduct research studies and evaluate surveillance system. Previous EISOs collaborated with CDC's international partners to provide technical assistance such as training field data collectors and assessing data quality.

Proposed Surveillance Project:

Project selection will be made in accordance with EISLB needs in Fall 2019 and EISO's interests. The EISO would be expected to review all of the protocols and SOPs before conducting an in-country site visit to evaluate the implementation. Proposed projects include:

Evaluation of implementation of newly established Acute Febrile Illness surveillance systems in Bangladesh and Liberia.

Evaluation of the usefulness of multiple modes for data collection in surveillance platforms using the Integrated Disease Surveillance and Response (IDSR) framework - Sierra Leone and other countries

Evaluation of the impact of community-based acute febrile illness surveillance in two communities in periurban Guatemala.

Evaluation of current situation of national infectious disease surveillance -- Pakistan

Current Position Data:

Numerous surveillance and study datasets are available for analyses from ongoing acute febrile illness surveillance, zoonotic disease surveillance, and applied public health research projects in DGHP countries (e.g., Bangladesh, Liberia, Colombia, Brazil, Kenya, India, Guatemala, Peru, Thailand, Kazakhstan). Research data from the Zika pregnancy cohorts from Guatemala, Kenya, and Thailand as well as Zika and other arbovirus laboratory diagnostic data are available for analyses by an incoming EISO in 2019.

Position Strengths: This is an ideal position for an EISO interested in becoming an expert in Global Health and on the practice of epidemiology and surveillance of emerging infectious diseases through the development and implementation of field-based projects. EISL Branch strengths include active collaborations with subject matter experts throughout the agency.
Staff & Resources: Support is available from several senior epidemiologists at headquarters and in countries where the EISO will work, many of whom are former EISOs themselves. Our epidemiologists have expertise in epidemiologic methods, field epidemiology, surveillance, outbreak response, statistical analysis, program evaluation, information systems, laboratory diagnostics, and applied international public health.
Special Skills Useful for this Position: Persons who enjoy working on a collaborative, interdisciplinary team will thrive in this environment. The ability to work as part of a team is essential, and familiarity with international settings is useful. This position requires someone who is flexible and can quickly recognize and adapt to appropriate diplomatic and cultural contexts. Knowledge of one or more foreign languages is advantageous but not required.
Domestic Travel: 0% **International Travel:** 25%

CGH-DGHP-ERRB-Georgia-2019-01

Primary Supervisor: Eva Leidman, Epidemiologist

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Secondary Supervisor(s):

- Michelle Hynes, Epidemiologist

Background: The officer will be assigned to the Emergency Response and Recovery Branch (ERRB) in the Division of Global Health Protection (DGHP) in the Center for Global Health. ERRB responds to complex humanitarian emergencies (CHEs) and strengthens global capacity to respond to and recover. ERRB is a multidisciplinary team of public health professionals who deploy frequently to both humanitarian emergencies and international natural disasters, and are responsible for coordinating CDC's response to CHEs. The branch is a major provider of technical assistance to the international community covering a number of topic areas including mental health, sexual and reproduction health, nutrition, surveillance, infectious disease, capacity building, water, sanitation and hygiene, and more! In all activities, the branch works with organizations such as the UN High Commissioner for Refugees (UNHCR), UNICEF, WHO, World Food Program (WFP), UN Population Fund (UNFPA), USAID's Office of Foreign Disaster Assistance (OFDA), US State Department Bureau for Population, Refugees and Migration (PRM), and various international non-governmental organizations. Projects listed below may change prior to the EISO joining given the emergency nature of the branch.
Current Work: -Investigation of Hepatitis E outbreak, Namibia

- Ebola outbreak investigation, DRC
- Evaluation of maternal death surveillance system, Sierra Leone
- Assessment of childhood indicators and malnutrition, Nigeria
- Ebola data management at WHO AFRO, Congo
- Evaluation of UNICEF's maternal and newborn health project, Papua New Guinea

Proposed Initial Projects: - Evaluation of high mortality rates in northeastern Nigeria using based community-based verbal/social autopsy

- Investigating the quality of care during and post C-Section for mother and newborn, Bangladesh
- Evaluation of program implementation scale-up, of temperature alert device and improved monitoring & supervision for Early Essential Newborn Care in Papua New Guinea
- Revision of Expanded Programme on Immunization protocols for refugees with UNHCR, location TBD

Proposed Analytic Project:
ERRB analytic work is primarily casual-inference and risk factor analysis using routine public health data. Working in international settings with often times remote and mobile populations, EISOs will have to use

complex sample size calculations and sampling methodologies. Advanced analysis may include multivariate modeling, survivor analysis, risk ratios, and correlation coefficients. Additionally, there is the potential for field investigation leading to analytic analysis depending on current projects available when the EISOs starts in the branch.

Proposed analytic projects for incoming EISO:

- Modeling to evaluate the association between nutritional status and measles/penta seroconversion among Rohingya refugees using complex sample design survey data from Bangladesh. Protocols have been developed for this project.
- Multiple linear regression analysis of population estimates and sphere standard calculations of using satellite machine learning algorithms in UNHCR refugee camps to elucidate the factors that affect accuracy for future estimates, site TBD. Protocols will have been developed when the EISO arrives in the branch. EISOs will be expected to assist with the data collection in the refugee camps.

Proposed Field Investigation Project:

Field work is essential to the ERRB EISO experience -- our EISOs have been all over the world working on a diversity of projects! Potential field investigation projects could include:

1) Evaluation of high mortality rates in northeastern Nigeria using community-based verbal/social autopsy
2) Investigating the quality of care during and post C-Section for mother and newborn, Bangladesh (and possibly Iraq and Nigeria)
3) Estimating population and sphere standards in refugee camps using satellite imagery, location TBD
4) Evaluation of program implementation scale-up, of temperature alert device and improved monitoring & supervision for Early Essential Newborn Care in Papua New Guinea
5) Revision of Expanded Programme on Immunization protocols for refugees with UNHCR, location TBD
6) ERRB also supports EISOs participating in Epi-Aids and emergency response deployments occurring outside the branch.

Previous EISOs have been involved in a Hepatitis E outbreak investigation in Namibia, SMART nutrition assessment among Rohingya refugees, investigation of a Hepatitis A outbreak in the Republic of Marshall Islands, survey evaluating ceramic water filter program among displaced populations in Myanmar, a mixed-methods investigation of child marriage in Iraq and Djibouti, and TB program evaluation in Tanzania refugee camps, to name a few.

In this position EISOs will have the opportunity to work with a diversity of partners including other US government entities (USAID, OFDA, etc.), United Nations (WHO, UNICEF, etc.), non-governmental organizations (IMC, SAVE, etc.), as well as academic partners such as Johns Hopkins University and Emory University. Many projects in the branch are requested by these organizations and will require the EISO to communicate frequently with these partners to effectively design the projects prior to going to the field and coordinate logistics. Once in the field the EISO will be expected to work with these other partners day-to-day to implement the project and ensure completion. In their second year, the EISO will be given more leadership roles, representing the branch and CDC in projects and emergency responses. In the past, we have had EISOs act as the CDC Liaison to OFDA in Haiti during Hurricane Matthew, seconded to WHO Geneva to assist in data management during the DRC Ebola outbreak, be case facilitators and teach at Rollins School of Public Health, and much more!

Proposed Surveillance Project:

Potential surveillance projects could include:

1) Monitoring and evaluation of Maternal/Perinatal death surveillance and response in Myanmar and Nepal. Would require site visits/field evaluation.
2) Evaluation of CDC's event based surveillance system. Working with CDC subject matter experts at CDC headquarters.
3) Evaluation of WHO's Health Emergencies Program Event Based Surveillance system at WHO headquarters.

Current Position Data:

1) Injury surveillance data from Iraq

2) Pregnancy outcome surveillance data set from Haiti
3) National HIV database, Haiti
4) Data from the landmine knowledge, attitudes and practices (KAP) survey in Colombia

Position Strengths: ERRB focuses on populations rather than a specific health condition. This provides the officer with a broad range of experiences encompassing both communicable and non-communicable diseases with the opportunity to impact health outcomes among highly vulnerable populations. The EISO in the branch will work on a number of projects in a range of topic areas and in diverse geographic locations, collaborating closely with international and national partners, building their professional network.

ERRB has won center and agency-wide awards for its response activities.

In addition to the diversity of projects offered in the branch, ERRB supports cross-branch, division, and CIO activities.

Staff & Resources: With over 20 subject matter experts in a range of topics in emergency/humanitarian response, EISOs will have the opportunity to work with a number of different project supervisors during their two years. There are a number of supporting members in the branch that will be available to the incoming EISO including a statistician, language tutor (French/Spanish), secretarial/admin support, and an EIS officer coordinator. Training both within CDC and externally with international partners will be available to the EISO.
Special Skills Useful for this Position: 1) Willingness to travel internationally, 2) previous international experience, particularly in emergency or post-emergency settings, 3) conversational in French or Portuguese (not required)
Domestic Travel: 5% **International Travel:** 25%

CGH-DGHT-EB-Georgia-2019-01

Primary Supervisor: Christine West, Epidemiologist, EIS 2004

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Secondary Supervisor(s):

- Drew Voetsch, Team Lead, EIS 2005
- Wolfgang Hladik, Branch Chief, EIS 1999

Background: The Epidemiology and Surveillance Branch (Division of Global HIV & TB) is a leader in developing, establishing, and advancing HIV surveillance standards globally. The branch has three teams: General Population Surveillance (GPS), Key Populations, and Clinical Surveillance and Epidemiology. The EIS officer will be on the GPS Team. The vision of the GPS team is to provide data from Population-based HIV Impact Assessments (PHIA) surveys to monitor the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) program impact and progress towards epidemic control. The team's priorities for the next 2 years include:

1. Demonstrate the impact of PEPFAR efforts and identify gaps based on results from the PHIA surveys conducted in 14 countries via reports, conference presentations, in-depth analyses, manuscripts, and workshops.

2. Pilot methods for combining a Tuberculosis prevalence survey with an HIV-focused survey in South Africa and support a combined Botswana AIDS Impact Survey and Tuberculosis Prevalence Survey.

3. Provide technical support as part of the initial implementation of the next generation of PHIA surveys in Mozambique, Lesotho, Eswatini, Zimbabwe, and Malawi.

The EIS officer will also have the opportunity to work on projects with the Key Populations, Clinical Surveillance teams and other branches in the division.
Current Work: Current projects include survey data analyses of 1) the impact of travel distance on HIV treatment outcomes in Tanzania, 2) characterization of survey participants who reported being HIV-positive but laboratory-confirmed to be HIV-negative, and 3) knowledge of HIV status among participants in the Cameroon Population-based HIV Impact Assessment (CamPHIA).

Proposed Initial Projects: The priority projects for the EISO will be 1) conducting the surveillance system evaluation in preparation for the EIS fall course, 2) evaluating the implementation of ART starter packs as part of community treatment initiation model in Lesotho, 3) self-disclosure, partner status, and other factors affecting awareness to inform and optimize testing strategies in 14 countries, 4) comparison of survey data on antenatal care attendance and prevention of mother-to-child HIV survey outcomes in 14 countries or 5) patterns and factors associated with detectable HIV viral load and HIV drug resistance in 14 countries.
Proposed Analytic Project:
The EISO can conduct single or multi-country analyses of PHIA survey data collected in Zimbabwe, Malawi, Zambia, Uganda, Tanzania, Lesotho, Eswatini, Namibia, Cameroon, Cote d'Ivoire, Ethiopia, Rwanda, Kenya, and/or Haiti. Data analysis are being conducted in SAS, Stata or R and account for the complex PHIA survey sample design using descriptive statistical methods and multivariate models. Available databases for the 14 completed surveys include approximately 25,000--40,000 participants per country, with extensive survey questionnaire and biomarker data.

Proposed analyses may include:
1) Engagement in HIV care among children, adolescents and adults, 2) Patterns and factors associated with detectable HIV viral load and HIV drug resistance, 3) Prevalence and correlates of adult male circumcision, 4) Tuberculosis screening, co-infection, isoniazid preventive therapy, and treatment among people living with HIV, 5) HIV risk factors among adolescent girls and young women, 6) Cervical cancer screening among HIV-positive women, 7) Impact and gaps in national prevention of mother-to-child HIV transmission programs, 8) Estimation of AIDS-related mortality estimates using national population-based surveys, 9) Self-disclosure, partner status, and other factors affecting awareness to inform and optimize testing strategies, 10) Linkage and treatment initiation of ART starter packs in surveys as part of community ART models, 11) Reported partner HIV status disclosure practices and correlation with secondary HIV prevention and HIV service uptake, and 12) Multi-level analysis of migration and association with awareness, health service access, and treatment outcomes.

Proposed Field Investigation Project:
In the next round of PHIA surveys (2019--2024), protocols will include offering same day antiretroviral treatment (ART) to participants who are newly diagnosed as HIV-positive during the survey. A clinical trial in Lesotho showed improved six month viral suppression among persons who were diagnosed with HIV in home-based counseling and testing for those who started same-day ART initiation compared to health facility referral (JAMA. 2018 Mar 20;319(11):1103--1112). The new PHIA protocol element will provide an opportunity to evaluate the effectiveness of offering rapid ART initiation in the setting of a household survey.

As part of the PHIA surveys in most countries, participants had the option to consent to future testing of stored plasma and dried blood spots and willingness to be contacted for future studies. Opportunities for primary data collection include 1) follow up of newly-diagnosed participants to confirm linkage to care in Lesotho and Eswatini, 2) follow up with the small number of participants who may have been previously misdiagnosed and are currently on ART in 11 countries.

The Epidemiology and Surveillance Branch support EISOs participating in Epi-Aids and emergency response deployments. Examples of field investigations by the current EISO are 1) Undetermined risk factors for loss to

follow up and loss to documentation among infants who do not pass newborn hearing screening -- Texas, 2018 (Epi-Aid 2018-034), 2) Oral cholera vaccine coverage survey in Zimbabwe, and 3) Epi investigation of unexplained events amongst US personnel working in Havana, Cuba (CDC Emergency Operations Center).

PEPFAR is prioritizing population-based, HIV-focused household surveys as a means of monitoring HIV incidence, prevalence, and viral load suppression. PHIA surveys serve as the most comprehensive evaluation of HIV outcomes and impact that are used by all stakeholders, including national HIV programs, PEPFAR, the Global Fund to Fight AIDS, Malaria, and Tuberculosis, and other donors and multilateral organizations, such as the World Health Organization (WHO) and UNAIDS. The survey results are used extensively in country and by international agencies to guide decisions under the PEPFAR Strategy for accelerating HIV/AIDS Epidemic Control (2017--2020). The EISO will work with ministries of health, non-governmental organizations, other U.S. Government agencies and implementing partners during PHIA surveys to help design, plan, implement, and evaluate PHIAs on the ground in countries supported by PEPFAR. The EISO will also analyze data and disseminate results to local, national and global stakeholders and at HIV-related scientific conferences.
Proposed Surveillance Project:
Evaluation of the use of home-based counseling and testing in PHIA, consent practices, response rates compared to the Demographic and Health Surveys (DHS) and other national household surveys in 14 countries.

Evaluation of HIV prevalence, and key behavioral indicators, gender based violence, and all cause-mortality data with results from DHS and other surveys conducted during similar timeframes in Uganda and other countries.

Evaluation of gaps and impact of national prevention of mother-to-child HIV (PMTCT) transmission and EID programs and comparison of survey data on ANC attendance and other PMTCT cascade outcomes in 14 countries.

Evaluation of HIV drug resistance surveillance systems and comparison of HIV genotypes, drug resistance mutations and viral load results from the surveys in Malawi and other countries.

Current Position Data:
The PHIA survey datasets include household, individual, and biomarker datasets for 14 completed PHIA surveys. Each survey dataset includes information from approximately 25,000--40,000 participants, including demographic, behavioral, and clinical data. In addition, each country has a biorepository of plasma and dried blood spot samples that will be used for seroprevalence surveys for conditions of public health importance.
Position Strengths: The PHIA surveys provide ground breaking and essential population-level HIV estimates in some of the most affected countries. PHIA results are used to direct national and international funding and focus programs in places and populations that will yield the greatest impact on epidemic control. The position strengths are the 1) immediate availability of PHIA survey datasets for analysis, 2) opportunity to gain experience in all aspects of PHIA surveys, 3) flexibility in areas of investigation depending on individual and country interest, and 4) ability to work with a multidisciplinary team of clinicians, epidemiologists, demographers, and laboratorians.
Staff & Resources: There are 11 former EIS officers in the branch including the branch chief. The General Population Surveillance Team includes one medical epidemiologist, three epidemiologists, three demographers, two data managers, a second year EISO, and three global public health fellows. The PHIA surveys are supported by PEPFAR through a 5-year, $275 million cooperative agreement from 2014-19. A new five-year agreement just started to facilitate a new round of PHIA surveys. The division also provides statistical support and a wide range of subject matter experts in HIV, tuberculosis, and other public health issues.
Special Skills Useful for this Position: Familiarity with quantitative data and analytic methods. Excellent verbal and written skills, including in communicating and diplomacy with foreign government officials. French or

Portuguese language skills desirable. Ready to travel internationally and work independently or under long-distance supervision.
Domestic Travel: 5% **International Travel:** 25%

CGH-DGHT-HPB-Georgia-2019-01

Primary Supervisor: Stephanie Davis, Medical Epidemiologist, EIS 2011

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Secondary Supervisor(s):

- Jonas Hines, Medical Epidemiologist, EIS 2015
- Carlos Toledo, Team Lead, Voluntary Medical Male Circumcision Team, Division of Global HIV and Tuberculosis

Background: The HIV Prevention Branch (HPB) in the Division of Global HIV and Tuberculosis (DGHT) performs a wide scope of activities to combat the global HIV epidemic. Our portfolio spans HIV testing, voluntary medical male circumcision (VMMC), and prevention activities for key populations, adolescent girls and young women. HPB is the largest DGHT branch.

The EISO will work primarily on the VMMC team. Male circumcision (MC) decreases men's risk for acquiring HIV through heterosexual sex by 60%. As a unique cost-saving biomedical intervention, MC provides lifelong partial protection through one clinical encounter, like some vaccinations. The US government supports free VMMC for males aged 10-49 years in 15 sub-Saharan African countries (Botswana, Eswatini, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, South Sudan, Tanzania, Uganda, Zambia, and Zimbabwe; CDC works in all but Lesotho and South Sudan). VMMC is changing rapidly: population-based datasets are quantifying impact, new circumcision devices require program modification and safety monitoring, and ambitious global targets require continuing innovation. The Atlanta-based team performs operational research, data analysis, program innovation, and technical assistance for VMMC scale-up (19 million to date).

Additionally, the EISO will complete projects with other HPB teams and DGHT branches, based upon EISO's interests.
Current Work: -Investigating risk factors for glans injuries during voluntary medical male circumcision (VMMC) services in 15 sub-Saharan African countries

- Service quality assessment of VMMC sites in these countries
- Updating guidance on severe adverse events of

Proposed Initial Projects: Priority will be placed on completing the surveillance system evaluation. However, multiple projects are available to begin within the first month, including guaranteed immediate access to several large datasets described below. In particular, the HIV incidence and seasonality analyses can be started at any time, as well as additional analyses on those same datasets that the EISO develops his/herself.
Proposed Analytic Project:
All analytic projects listed here use existing datasets, so protocol development is not needed. Additionally, the primary data collection projects could become later analytic projects. Potential approaches include descriptive analysis, multivariable regression, time-series, and proportional hazards analyses.

- Examine the association of partner's circumcision status with HIV incidence and prevalence in women in nationally-representative, household-based cluster surveys from 8 countries (Eswatini, Lesotho, Malawi, Namibia, Tanzania, Uganda, Zambia, and Zimbabwe), to demonstrate whether protective associations seen in observational and randomized studies are confirmed in large population interventions.

- Using routine program data, perform time-series analysis to assess seasonality of MC performance and client demographics in the 15 VMMC countries, to help programs target demand creation, plan campaigns, and maximize impact
- Analyze reports from what we believe is the only pooled multicountry surveillance system of surgical adverse events in the 15 VMMC countries, for risk factors and demographics
- HIV Testing Services Team project: Evaluate a screening tool for HIV transmission risk factors among persons living with HIV in Mozambique

Key Populations Team projects:

- Compare effectiveness of take-away versus daily methadone dosing strategies for people who inject drugs in Tanzania
- Analyze retention in pre-exposure prophylaxis (PrEP) across key population groups in Nigeria, Rwanda and Tanzania during 2019 using routine program monitoring data

Proposed Field Investigation Project:

- Compare HIV risk behaviors of incoming MC clients to those in the general population in Kenya, Tanzania and/or other countries to determine whether MC is attracting clients at higher, lower or similar HIV risk to the general population to assess impact

Collaboration with the full landscape of public health entities is a strength of this position. Most VMMC activities are done in cooperation with WHO, USAID, the Department of Defense, non-governmental organizations (NGOs) including universities (all service delivery and almost all research is implemented by NGO partners), and/or the Bill and Melinda Gates Foundation, and national Ministries of Health. The EISO will have opportunities to evaluate and support grantee performance on site visits and virtually, collaborate with multilateral agencies in developing guidance and other technical documents, make interagency technical decisions with DoD and USAID, and make technical recommendations to foreign Ministry of Health staff as a representative of the US Government.

Proposed Surveillance Project:

Several surveillance options exist. EISOs could choose based on interest.

- PEPFAR established an adverse event (AE) surveillance system to monitor AEs reported during VMMC in the 15 sub-Saharan African countries implementing VMMC. The system passively collects detailed clinical information from investigations of a subset of the serious adverse events related to circumcision. Concerns exist particularly around under-reporting (sensitivity). The EISO could perform a comparative investigation in a single country that includes chart reviews and key informant interviews at MC sites to assess this, as well as other aspects of the system. (Recommended)

- Countries such as Kenya, Namibia, Tanzania, Malawi, Uganda and others that are introducing an MC device (called the ShangRing) are conducting or have conducted formal surveillance projects to assist MoHs decide whether to proceed with national scale-up of this new method. AE surveillance is a part of these surveillance projects. The EISO could perform chart reviews and key informant interviews at participating MC sites to assess how reliably this time-limited surveillance project is capturing the true safety profile of the device.

Current Position Data:

Dataset from: >3 years of programmatic data (e.g., participant numbers and key demographics) from the 15 countries implementing VMMC and the 29 countries and regional programs implementing HTS; three large (i.e., >5,000 participants) cross-sectional surveys conducted in Tanzania, Mozambique, and South Africa tracking HIV prevention interventions scale up and impact; and 8 nationally-representative household-based cluster surveys in sub-Saharan Africa measuring impact of HIV programs at a population level. Data from required clinical investigations of severe adverse events in the 15 countries implementing VMMC . Several ongoing studies of VMMC demand creation and targeting and ShangRing rollout will provide additional datasets.

Position Strengths: The position will provide a solid grounding in international public health practice and research, in a high-impact and rapidly evolving field, with two former EISO supervisors. The EISO will have ample

international travel opportunities. There is an excellent balance of programmatic and analytic work, with multiple available datasets. Analytic work includes the spectrum of operational research, program performance and quality indicators, and clinical outcome data. We work closely with the full breadth of major global health partners, providing opportunities to develop contacts and the "soft skills"□ of public health. EISOs are welcome to continue clinical work if desired.
Staff & Resources: Both supervisors are medical epidemiologists who completed EIS in the past 10 years. The branch has 9 EIS alumni. Within the HIV prevention branch, the EISO will have access to numerous experts in various areas (HIV testing, key populations, adolescent girls and young women, etc.). The VMMC team frequently collaborates with DGHT's statistics branch for complex statistical issues; this resource is also available. DGHT branches span the breadth of global HIV response: epidemiology, surveillance, care & treatment, HIV/TB disease, mother-to-child transmission, economics, health systems, etc. There is support for ample international travel, with expert field colleagues at all destinations.
Special Skills Useful for this Position: - Basic familiarity with international travel and, ideally, health systems in resource-limited settings

- Desire for a substantial amount of international travel
- Clinical background (MD, RN, DVM), given the clinical nature of the core activity
- Conc

Domestic Travel: 5% **International Travel:** 20%

CGH-DPDM-MB-Georgia-2019-01

Primary Supervisor: Julie Gutman, Medical Officer

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Secondary Supervisor(s):

- Anna Bowen, Medical Officer, EIS 2003

Background: The Malaria Branch (MB) in the Division of Parasitic Diseases and Malaria is at the forefront of global malaria control and elimination efforts. MB has four units: Program Implementation, Strategic and Applied Sciences, Laboratory Research and Development, and Domestic Response. As the key technical partner for several international malaria initiatives such as the U.S. President's Malaria Initiative (PMI), the Amazon Malaria Initiative (AMI), and the Malaria Zero consortium (MZ), the branch leads efforts to monitor and evaluate malaria interventions, track antimalarial drug and insecticide efficacy, design and evaluate strategies for improving facility- and community-based malaria case management, reduce the burden of malaria especially among pregnant women and children, and evaluate approaches for malaria elimination in Africa, Asia, South and Central America, Haiti, and the Dominican Republic. Our long-standing collaborations with research institutions (i.e., in Kenya, Malawi, Tanzania, Uganda) likewise offer unique overseas applied public health research experiences in a variety of settings.

In addition, MB develops and maintains guidelines for malaria prevention, diagnosis and treatment among US travelers and advises clinicians treating malaria patients in the US. The Domestic Response Unit conducts surveillance among malaria cases diagnosed in the US, including for molecular markers of drug resistance.
Current Work: 1) Antimalarial therapeutic efficacy studies (several countries); 2) Case investigation of transfusion-transmitted malaria; 3) Effectiveness of age-expanded integrated community case management of malaria, Madagascar; 4) Analysis of longitudinal serological data from Senegal; 5) Health facility survey, Madagascar; 6) Rapid assessment of urban malaria transmission in Guinea
Proposed Initial Projects: 1) Assist with Malaria Vaccine Pilot Evaluation household survey (western Kenya); 2) Analyze Continuous Demographic and Health Survey and surveillance data for coverage of interventions for malaria in pregnancy (Senegal3) Conduct cRCT of housing modifications (Uganda); 4) Assess the efficacy of long-

lasting insecticidal nets (LLIN) treated with the synergist piperonyl butoxide (PBO) compared to LLINs without PBO using routinely collected data (Malawi).

Proposed Analytic Project:

EISOs will have the opportunity to analyze existing datasets, and data collected during field projects. Analytic opportunities include multivariate modeling, analyses of effect modification, and analyses that take into account complex sampling design (see field investigations below, cluster-randomized controlled trials). Examples of analytic projects with existing protocols (anticipate approval) include several which the EISO could help conduct/analyze:

1. Follow-up survey assessing delivery of intermittent preventive treatment in pregnancy by community health workers in Malawi- this will involve a descriptive analysis, conducting a difference in difference analysis to assess the change over time in control and intervention groups from baseline, and multivariate logistic regression (approved protocol)
2. Evaluation of a new tool, attractive targeted sugar baits (ATSBs), to address residual outdoor malaria transmission in western Kenya;
3. Household survey of the Malaria Vaccine Pilot Evaluation in western Kenya
4. Analysis of Senegal Continuous Demographic and Health Survey and surveillance data for coverage of interventions for malaria in pregnancy
5. Analysis of data from pilot and cluster-randomized controlled trial of housing modification in Uganda

Proposed Field Investigation Project:

Available field opportunities from which Malaria Branch EISOs can select include primary data collection, supervising field teams, assisting with data analysis and report writing for:

1) the second household survey for the Malaria Vaccine Pilot Evaluation in western Kenya
2) a pilot and cRCT of housing modifications for malaria prevention in Uganda
3) a follow-up survey assessing the delivery of intermittent preventive treatment in pregnancy by community health workers in Malawi
4) a new tool, attractive targeted sugar baits (ATSBs), to address residual outdoor malaria transmission in western Kenya
5) baseline surveys for a study assessing the efficacy of group antenatal care to improve uptake of intermittent preventive treatment in Tanzania and Benin
6) Epi-Aids within (ex: transfusion transmitted malaria) and outside of the branch.

The EISO will work with a range of partners from local and state health departments, other Federal agencies, non-governmental organizations, ministries of health, and national and international health organizations. The nature of the collaboration will be project-specific and may include such activities as participation in policy and programmatic discussions at multilateral meetings, evaluating aspects of a national surveillance system, leading a team of collaborators during a field investigation, conducting technical trainings for ministry of health staff, and/or developing a protocol and survey tools with partners.

Proposed Surveillance Project:

Evaluate surveillance data collected at the community level in the routine health information systems in Madagascar and/or Malawi- this will involve a review of data collected by the national health management information system and comparison to data collected directly from the community health worker registers to understand the accuracy of such data and means to improve the accuracy. Field visits to the country will be required.

Current Position Data:

Existing datasets include: US National Malaria Surveillance System data; U.S. artesunate investigational new drug data; nationally-representative household survey data (multiple countries); Kenya Demographic Surveillance System longitudinal data; data from malaria control activities in multiple countries.

Position Strengths: The Malaria Branch has a long history of successfully supervising EIS officers and values the contribution of its officers. In addition to their domestically and internationally recognized subject matter

expertise, most of the branch epidemiologists are EIS alumni familiar with the educational objectives of EIS. The diversity of projects and international settings allows flexibility in shaping this position to meet the individual skills, interests and training needs of the incoming EISOs.

Staff & Resources: The MB EISO will work with a diverse set of public health professionals"”epidemiologists, medical and veterinary officers, laboratory scientists, health scientists, and public health advisors"”who work on projects that often bridge units and other branches at CDC, including the Entomology Branch. Statistical support is available through biostatisticians at the Division of Parasitic Diseases and Malaria. Following the EIS Summer Course, the Division of Parasitic Diseases and Malaria provides an introductory parasite course to EISOs and other new staff coming into the Division.
Special Skills Useful for this Position: Knowledge of foreign languages (e.g., French, Portuguese, Spanish) while not required, is an asset for this position, as it will facilitate the EIS officer's work in some international settings.
Domestic Travel: 5% **International Travel:** 20%

CGH-DPDM-MB-Georgia-2019-02

Primary Supervisor: Kathrine Tan, Unit Chief, EIS 2003

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Secondary Supervisor(s):

- Achuyt Bhattarai, Medical Epidemiologist, EIS 2008

Background: The Malaria Branch (MB) in the Division of Parasitic Diseases and Malaria is at the forefront of global malaria control and elimination efforts. MB has four units: Program Implementation, Strategic and Applied Sciences, Laboratory Research and Development, and Domestic Response. As the key technical partner for several international malaria initiatives such as the U.S. President's Malaria Initiative (PMI), the Amazon Malaria Initiative (AMI), and the Malaria Zero consortium (MZ), the branch leads efforts to monitor and evaluate malaria interventions, track antimalarial drug and insecticide efficacy, design and evaluate strategies for improving facility- and community-based malaria case management, reduce the burden of malaria especially among pregnant women and children, and evaluate approaches for malaria elimination in Africa, Asia, South and Central America, Haiti, and the Dominican Republic. Our long-standing collaborations with research institutions (i.e., in Kenya, Malawi, Tanzania, Uganda) likewise offer unique overseas applied public health research experiences in a variety of settings.

In addition, MB develops and maintains guidelines for malaria prevention, diagnosis and treatment among US travelers and advises clinicians treating malaria patients in the US. The Domestic Response Unit conducts surveillance among malaria cases diagnosed in the US, including for molecular markers of drug resistance.

Current Work: 1) Antimalarial therapeutic efficacy studies (several countries); 2) Case investigation of transfusion-transmitted malaria; 3) Effectiveness of age-expanded integrated community case management of malaria, Madagascar; 4) Analysis of longitudinal serological data from Senegal; 5) Health facility survey, Madagascar; 6) Rapid assessment of urban malaria transmission in Guinea
Proposed Initial Projects: - Implement therapeutic efficacy study (Ethiopia)
- Assist with baseline survey for study of mass drug administration (MDA) (Senegal)
- Conduct baseline survey for cluster-randomized controlled trial (cRCT) comparing reactive case detection to targeted MDA (Ethiopia)
- Analyze U.S. surveillance and CDC's investigational new drug data comparing outcomes of severe malaria treated with artesunate vs quinidine.

Proposed Analytic Project:
EISOs will have the opportunity to analyze existing datasets, and data collected during field projects. Analytic opportunities include multivariate modeling, analyses of effect modification, and analyses that take into account complex sampling design (see field investigations below, cluster-randomized controlled trials).

Examples of analytic projects using existing datasets, but for which short, secondary data use protocols will be needed, include:

- Analyze U.S. surveillance and CDC's investigational new drug data comparing outcomes of severe malaria treated with artesunate vs quinidine using propensity score matching and multivariate logistic regression.

Examples of analytic projects using data that the EISO will collect (existing protocols which we expect to be approved prior to EISO starting):

- Therapeutic efficacy study (Ethiopia) - Kaplan Meier survival analysis, and calculating hazard ratios
- Baseline survey for study of mass drug administration (MDA) (Senegal) -- complex multi-stage sampling; analysis will require weighting and cluster adjustment, and will include multivariable logistic regression
- Baseline survey for cluster-randomized controlled trial (cRCT) comparing reactive case detection to targeted MDA (Ethiopia) -- complex multi-stage sampling; analysis will require weighting and cluster adjustment, and will include multivariable logistic regression
- Analyze U.S. surveillance and FDA's investigational new drug data comparing outcomes of severe malaria treated with artesunate vs quinidine.

Proposed Field Investigation Project:
Available field opportunities from which Malaria Branch EISOs can select include primary data collection, supervising field teams, and assisting with data analysis and report writing for:

- Therapeutic efficacy study in Ethiopia
- Baseline survey for study of mass drug administration in Senegal
- Baseline survey for a cluster-randomized controlled trial (cRCT) comparing reactive case detection to targeted mass drug administration in Ethiopia
- Baseline surveys for a study assessing the impact of expanding the age range of community case management of malaria in Malawi and Madagascar
- Epi-Aids within (ex: transfusion transmitted malaria) and outside of the branch.

EISOs have many opportunities to collaborate with both domestic and international public health partners. Internationally, the EISO will work in the field with partners from ministries of health, national malaria control programs, WHO, and other implementing partners. This is an opportunity to learn the roles of major global partners in the role of global malaria control. Domestically, officers will interact with state and local health departments when they respond to inquiries about malaria prevention, diagnosis, and treatment, and investigations of malaria in persons who had not traveled.

Proposed Surveillance Project:
Evaluate the U.S. National Malaria Surveillance System (NMSS). Malaria is a mandatorily reported disease in the U.S. Several modifications to the NMSS are currently planned, and will be rolled out in the next year. This evaluation will provide a baseline for comparison for a subsequent assessment of the newly modified system. As this system involves reporting from the State Health Departments to CDC, this evaluation will involve interviews with stakeholders at select State Health Departments and CDC, as well as analysis of available NMSS data.

Current Position Data:
Existing datasets include: US National Malaria Surveillance System data; U.S. artesunate investigational new drug data; nationally-representative household survey data (multiple countries); Kenya Demographic Surveillance System longitudinal data; data from malaria control activities in multiple countries.

Position Strengths: The Malaria Branch has a long history of successfully supervising EIS officers and values the contribution of its officers. In addition to their domestically and internationally recognized subject matter expertise, most of the branch epidemiologists are EIS alumni familiar with the educational objectives of EIS. The diversity of projects and international settings allows flexibility in shaping this position to meet the individual skills, interests and training needs of the incoming EISOs.
Staff & Resources: The MB EISO will work with a diverse set of public health professionals'"epidemiologists, medical and veterinary officers, laboratory scientists, health scientists, and public health advisors'"who work on projects that often bridge units and other branches at CDC, including the Entomology Branch. Statistical support is available through biostatisticians at the Division of Parasitic Diseases and Malaria. Following the EIS Summer Course, the Division of Parasitic Diseases and Malaria provides an introductory parasite course to EISOs and other new staff coming into the Division.
Special Skills Useful for this Position: Knowledge of foreign languages (e.g., French, Portuguese, Spanish) while not required, is an asset for this position, as it will facilitate the EIS officer's work in some international settings.
Domestic Travel: 5% **International Travel:** 20%

CGH-GID-ISB-Georgia-2019-01

Primary Supervisor: Sarah Bennett, Medical Officer, EIS 2010

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Secondary Supervisor(s):

- Lucy Breakwell, Epidemiologist, EIS 2013

Background: The Global Immunization Division (GID) addresses key immunization challenges, including controlling, eliminating, and eradicating vaccine preventable diseases (VPDs, including polio, measles, and neonatal tetanus); strengthening VPD surveillance; ensuring quality of vaccination delivery to achieve high and equitable coverage; and conducting and promoting research, innovation, and evaluation to improve policy and program implementation. GID has >230 Atlanta-based and international field staff in four branches (see http://www.cdc.gov/globalhealth/immunization/). The officer in this position will have a primary supervisor in Immunization Systems Branch (ISB) and a secondary supervisor in the Accelerated Disease Control and VPD Surveillance Branch (ADCSB); both will ensure ongoing support throughout GID to identify projects to gain experience and develop skills in the full range of global immunization activities. ISB focuses on novel strategies to increase immunization coverage and equity for commonly utilized, under-utilized, and new vaccines. ISB is comprised of 3 teams: Access Utilization Team, Vaccine Introduction Team, and Demand, Policy and Communication Team. ADCSB focuses on global measles, rubella, hepatitis B and neonatal tetanus elimination and strengthening surveillance systems for VPDs. ADCSB includes Measles Team, Rubella Team, Targeted VPD Team, and VPD Surveillance Team. International travel is required to participate in the full range of opportunities in global immunizations.
Current Work: Diphtheria outbreak response among Rohingya refugees; serosurveys of neglected tropical diseases and vaccine preventable diseases in Cambodia and in Rohingya refugees; evaluation of the WHO Global Invasive Bacterial Vaccine Preventable Disease Surveillance System; tetanus surveillance review in Ethiopia; and analysis of rotavirus and pneumococcal conjugate vaccine introduction.
Proposed Initial Projects: 1. Case study on comprehensive vaccine-preventable disease surveillance systems, African or Western Pacific region country
2. End line survey for measuring impact of Ghana 2nd Year of Life Project
3. Analysis and publication of WHO/UNICEF 2018 global vaccination coverage estimates
Proposed Analytic Project:
The Ghana 2YL Project, a multi-year, multi-stakeholder global health security flagship project, seeks to improve vaccination coverage and equity through the expansion of routine immunization programs into the 2nd year of life. A final survey documenting impact of the 2YL activities is planned for data collection in March-April 2020.

Findings from the 2020 mixed-methods quantitative and qualitative survey will be compared with baseline data collected in 2016 and 2017 to assess whether the project has had a meaningful impact on measles, Meningitis A, and inactivated polio vaccination coverage in three regions of Ghana. Multivariate risk factor analysis for failure to receive vaccination will also be performed. Changes in knowledge and behavior among caregivers and healthcare workers and changes in healthcare facility practices will also be assessed through quantitative and qualitative data analyses. Planned EISO activities include questionnaire and database development with pilot testing; enumeration and randomized selection of participants; supervision of data collection, key informant interviews, and focus group discussions; analyses; participation in final stakeholder workshop to review findings and plan future vaccination program activities; and manuscript preparation. Statistical support will be provided by technical staff of the Ghana 2YL Project and by the GID Statistics and Data Management Team. The assessment will be done in collaboration with the Ghana Health Service, African Field Epidemiology Network, and Ghana Field Epidemiology and Laboratory Training Program, among others. There will be numerous opportunities to apply the findings of these analyses to global discussions on improving vaccination coverage and equity in other countries.

Proposed Field Investigation Project:

Recent studies in Nigeria, Zambia, Cambodia, and other countries indicate that healthcare workers are hesitant to open 10-dose measles vaccine vials because of concerns over vaccine wastage during small immunization sessions, leading to missed opportunities for vaccination. UNICEF announced that they will begin procuring 5-dose measles vaccine vials during 2019--2020. An assessment to document impact of 5-dose vials on healthcare worker behavior on opening vials, immunization coverage, wastage, and cold chain capacity pre and post switch will be undertaken in one or more countries (possibilities include Laos PDR, Malawi, and/or Bangladesh). Collaboration with Ministry(s) of Health and partner agencies supporting in-country immunization efforts is anticipated. Analyses, conclusions, and recommendations will provide relevant information to countries considering making the switch from 10-dose to 5-dose measles vaccine vials. International travel to one or more countries will be required to assess quality of available data, complete data collection and analysis, draft reports of findings, and meet with stakeholders.

In addition, previous EIS officers in this position have supported a number of Epi-Aids and emergency response deployments (e.g., diphtheria outbreak in Rohingya refugees in Bangladesh). Our officer may have the opportunity to support diphtheria and measles outbreak response, implement and evaluate new or under-utilized vaccines (e.g., Ebola vaccine), and evaluate novel strategies to improve vaccination coverage and equity in the unreached.

GID works in collaboration with many international partners and has a special relationship with WHO, UNICEF, and other key global vaccine partners. Previous EISOs have conducted surveillance evaluations, analytical projects, and other field activities with WHO headquarters staff in Geneva and with regional and country WHO office staff. Projects are conducted in international settings, which allows an EISO to gain experience engaging and collaborating with staff from ministries of health; other in-country inter-governmental partners (e.g., regulatory authorities, data and health information agencies, ministries of education); and local, regional, and international partners, including WHO, UNICEF, and non-governmental organizations. Many of the projects also engage staff and fellows from Field Epidemiology and Laboratory Training Programs, universities, and statistical organizations, so an EISO will have the opportunity to work with and train other public health trainees as he/she leads a field investigation.

Proposed Surveillance Project:

Comprehensive Vaccine-Preventable Disease (VPD) Surveillance Systems: A Case Study. VPD surveillance systems are fragmented, with multiple systems running in parallel. Most countries have national case-based surveillance for polio, measles, and neonatal tetanus; and some countries also have sentinel case-based surveillance for one or more other VPDs, such as invasive bacterial diseases. Most countries also have national notifiable disease surveillance from health facilities and, in some cases, outbreak or event-based surveillance to capture reports from the community and media. This fragmentation may limit data use for decision-making by immunization programs. Recently the World Health Organization (WHO) proposed a new "comprehensive VPD

surveillance"□ system at country, regional, and global levels to meet the minimal recommended standards for surveillance of priority VPDs. GID is engaging in a collaborative, cross-branch project to document country examples in the WHO African (AFR) and Western Pacific (WPR) regions of challenges, enabling factors, and innovations with regard to operational linkages between different surveillance systems and common functional components. The surveillance evaluation will be a case study in one AFR or WPR country and consist of in-person data collection, including field observations and key informant interviews. Key informants will include surveillance, laboratory, and health information staff at national and subnational levels. Data will be collected on the enabling factors and challenges in integrating various aspects of VPD surveillance, such as information systems, laboratory networks, supervision, and resource mobilization. This project could guide stakeholders in better design and implementation of comprehensive VPD surveillance systems in the polio transition context.
Current Position Data:
National immunization coverage surveys, VPD surveillance data, disease sero-prevalence studies, Demographic Health Surveys, WHO/UNICEF Joint Reporting Form estimates for global immunization programs, and data collected through research studies and program evaluation activities which may be utilized as part of additional descriptive and analytic activities, as well as other projects (e.g., outbreak response, risk assessment).
Position Strengths: This position offers a unique opportunity to gain extensive international experience with global partners and experts in immunization activities, conduct research studies, and design and implement program evaluations with significant public health impact. The position includes a wide range of projects across a variety of VPDs and will lead to a well-rounded training experience with skills translatable to work in other areas of public health.
Staff & Resources: Staff with extensive experience in VPD surveillance, outbreak response, disease control and elimination, health system strengthening and capacity building, behavioral science, operations research, economics research, communications, and policy analysis. Division statisticians will provide study design and statistical support.
Special Skills Useful for this Position: Language skills in French or other foreign languages are useful but not required. International travel is required to participate in the full-scope of immunization activities; therefore flexibility for traveling for up to 4-6 weeks at a time; ability to acclimate to foreign cultures/countries quickly and withstand hardships of the field; and ability to work well with others on multidisciplinary teams.
Domestic Travel: 0% **International Travel:** 25%

CGH-GID-PE-Georgia-2019-01

Primary Supervisor: Ahmed Kassem, Medical Epidemiologist, EIS 2015

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Secondary Supervisor(s):

- Chung-won Lee, Science, Policy and Research Coordinator, EIS 2003
- Jaymin Patel, Epidemiologist, EIS 2016

Background: The Global Immunization Division (GID) addresses key immunization challenges, including controlling, eliminating, and eradicating vaccine preventable diseases (VPDs); strengthening VPD surveillance; ensuring quality of vaccination delivery to achieve high and equitable coverage; and conducting and promoting research, innovation, and evaluation to improve policy and program implementation. GID comprises four branches and has >200 staff, including 4 EISOs; and a network of field assignees in multiple countries. In this position, the EISO will have primary and secondary supervisors in the Polio Eradication Branch (PEB) and a secondary supervisor in the Strategic Information and Workforce Development Branch (SIWDB); all will ensure that the EISO has support throughout GID in identifying and developing projects that provide experience in the full range of global immunization. The mission of PEB is to complete polio eradication in partnership with Global Polio Eradication Initiative (see http://polioeradication.org/); it has four teams: Africa Team; Eastern

Mediterranean Team; Nigeria Team; and Surveillance, Innovation and Research Team. SIWDB focuses on strengthening immunization workforce capacity development and data quality and use; it has four teams: Statistics and Data Management Team; Stop Transmission of Polio (STOP) Team; Strategic Information Team; and Workforce Development Team.

Current Work: Evaluation of acute flaccid paralysis surveillance, Morocco; Immunization information system assessments, Grenada; Response to an outbreak of circulating vaccine-derived poliovirus, Kenya; Assessment of acute flaccid paralysis case surveillance, Nigeria; Determinants of immunization data use, Afghanistan; and Assessment of immunization and malaria prevention services, Sierra Leone.

Proposed Initial Projects: - Evaluation of polio environmental surveillance system in Pakistan
- Estimation of oral poliovirus vaccine effectiveness in Afghanistan
- Assessment of community-based surveillance impact in Sudan
- Assessment of completeness and timeliness of DHIS2 Routine Immunization module in Nigeria
- Participation in polio outbreak responses in Democratic Republic of the Congo, Horn of Africa, Papua New Guinea, Mozambique and Indonesia
- Participation in the design of sub-national workforce capacity building program and its implementation in Ghana

Proposed Analytic Project:

The EISO will learn and apply basic and advanced epidemiologic methods in a variety of analytic projects with direct impact.

- OPV effectiveness in Afghanistan: Afghanistan is one of the three remaining countries where transmission of wild poliovirus type 1 (WPV1) has not been interrupted. Previous studies documented lower effectiveness of oral poliovirus vaccine (OPV) in less developed countries in a wide range of different settings. The objective of this project is to estimate the vaccine effectiveness (VE) of OPV against WPV1 in Afghanistan because of the limited VE information available from this country. This project will utilize existing surveillance, vaccination campaign and serosurvey data to complete descriptive and case-control analyses; the vaccination history of children with confirmed poliomyelitis will be compared with that of children with acute flaccid paralysis (AFP) due to other causes to estimate VE. Further, supplementary analyses will be needed to assess extent of caregiver recall error and to account for changes in OPV types (bivalent, monovalent, trivalent) provided over time.
- CBS impact in Sudan: CDC has collaborated with partners to use existing AFP community-based surveillance (CBS) networks for fever/rash surveillance and vaccination among high-risk population groups in Sudan. The objective of this project is to measure effect of CBS on quality and sensitivity of surveillance and on vaccination demand creation. The project will utilize district-level data on number of reported AFP/fever/rash cases and number of cases with zero vaccine dose to calculate/analyze several indicators and conduct pre-post comparisons while controlling for differences between districts.

Proposed Field Investigation Project:

The EISO will have opportunities for primary data collection during polio, measles or other VPD outbreak responses/campaigns. This include collection of information needed for microplanning (e.g., target population, maps, movement plans); intra-campaign monitoring (e.g., number of children monitored, number and source of independent monitors) and post-campaign monitoring (e.g., vaccination status of children). The EISO can also have the opportunity to examine of risk factors for the incidence of VPD in addition to vaccination history. Possible international deployments for polio outbreak responses include Democratic Republic of the Congo, Horn of Africa, Papua New Guinea, Mozambique and Indonesia. Further opportunities for field investigation may include the monitoring and evaluation (M&E) of Immunization and Surveillance Data Specialists (ISDS) deployment in Madagascar. The EISO will have an opportunity to take an active role in developing an M&E framework and conducting primary data collection, analysis and interpretation of the data to help identify attributes of an effective and sustainable data and workforce strengthening strategy. Additionally, the EISO will have support to participate in Epi-Aids and emergency response deployments based on interest and availability. The EISO will have the opportunity to develop expertise in vaccine preventable diseases and to work with the public health professionals at national and subnational levels in countries of interest, World Health Organization

(WHO), United Nations Children's Fund (UNICEF), and other global partners in country, regional or headquarter offices. Previous EISOs engagements included deployments to WHO offices in Amman, Jordan and Nairobi, Kenya. Potential projects in which the EIS officer will directly engage with global partners include evaluation of AFP surveillance in Nigeria, Pakistan, Papua New Guinea, Sudan or Yemen; analysis of inaccessibility and incidence of confirmed polio in Afghanistan; evaluation of surveillance for immunodeficiency-related vaccine-derived poliovirus in Egypt; and assessment of completeness and timeliness of data from the District Health Information Software 2 (DHIS2) Routine Immunization module in Nigeria.

Proposed Surveillance Project:

The EISO will have the opportunity to assess a surveillance system of international significance. Pakistan is one of the three remaining countries where transmission of wild poliovirus type 1 has not been interrupted. Within the polio eradication program, environmental surveillance (ES) refers to testing of sewage or other environmental samples for presence of poliovirus. Given a low case to infection ratio for poliovirus infection, ES can detect poliovirus circulation in the community without relying on clinical presentation of disease (AFP). The objective of this project is to conduct an evaluation of the ES system in Pakistan to identify strengths and weaknesses, and to make recommendations for improvements. The project will assess the following key attributes of the ES system: simplicity, flexibility, data quality, acceptability, sensitivity, representativeness, timeliness and stability. Data sources include 1) WHO's guidelines for environmental surveillance of poliovirus circulation and other pertinent documents and reports; 2) key informant interviews and focus group discussions with the Global Polio Eradication Initiative (GPEI) partners, including program staff in Pakistan, 3) laboratory and surveillance data that include line lists of AFP cases and environmental samples, and 4) maps of location of collection sites for environmental samples.

Current Position Data:

Data are available from vaccine preventable disease surveillance systems including the Polio Information System, (POLIS), seroprevalence studies, national coverage surveys, Demographic Health Surveys, WHO/UNICEF joint reporting estimates for global immunization programs, and data collected through research studies and program evaluation activities.

Position Strengths: This position offers a great opportunity to be part of the global polio eradication initiative and to strengthen immunization programs around the world. Enjoy a supportive, friendly environment with many EIS alumni. Develop expertise in vaccine preventable diseases and help implement a wide range of projects in a variety of vaccines/diseases, which will lead to a well-rounded training experience as well as skills that are translatable to other areas of public health. GID has a strong record of EIS graduates who have remained in global immunization both at CDC and other international organizations (WHO, UNICEF, PAHO, etc.).

Staff & Resources: GID staff have extensive experience in field epidemiology, surveillance, outbreak response, disease control and elimination, health system strengthening and capacity building, behavioral science, operations research, economics research, communications, and policy analysis. Division statisticians will provide study design and statistical support. An intensive two-week training in polio and other vaccine preventable diseases (Stop Transmission of Polio or STOP training) is offered during May of each year. Spanish and French language classes are available within GID. The EISO will have three supervisors as a source of guidance and support, which will facilitate a wide range of opportunities for projects and learning.

Special Skills Useful for this Position: The most important skills for this position are flexibility, enthusiasm to learn, and ability to work as part of a team and with different partners. The ability to acclimate to foreign cultures/countries quickly and withstand hardships of the field will be helpful. Experience using statistical software and foreign language skills are useful but not required.

Domestic Travel: 0% **International Travel:** 25%

Center for Preparedness and Response

The Center for Preparedness and Response (CPR) oversees programs that comprise CDC's public health preparedness and response portfolio, including the CDC Emergency Operations Center (EOC). The Division of State and Local Readiness (DSLR) administers CDC's Public Health Emergency Preparedness (PHEP) program. DSLR includes the Applied Science and Evaluation Branch, which analyzes nationwide preparedness data and the Field Services Branch, which manages the Career Epidemiology Field Officer (CEFO) program. Additionally, when CDC activates the EOC, DSLR establishes the State Coordination Taskforce (SCTF) to coordinate activities between CDC and health departments across the United States. During past responses, SCTF has established nationwide active monitoring of persons at risk of Ebola, a comprehensive healthcare response plan for persons with suspected Ebola virus disease, and a territorial Zika coordination unit to oversee CDC response efforts in US-affiliated Pacific and Caribbean islands.

CPR-DSLR-ASEB-Georgia-2019-01

Primary Supervisor: Sara Vagi, Team Lead, EIS 2008

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Secondary Supervisor(s):

- Jessica Tomov, Epidemiologist, EIS 2015
- Rachel Avchen, Branch Chief, EIS 2000

Background: The mission of the Applied Science and Evaluation Branch (ASEB) is to strengthen public health preparedness, response, and recovery through science and evaluation. ASEB collects and analyzes data related to performance accountability including relevant information during a CDC Emergency Operation Center (EOC) activation and post event after-action reports. ASEB offers an EISO epidemiology experience through applied science and evaluation focused on state and local preparedness. Our EISO will conduct applied epidemiology to ascertain public health consequences of large-scale events and to inform readiness and resilience science. Additionally, ASEB staffs the State Coordination Taskforce (SCTF, recently activated in response to Ebola, Zika, and the 2017 Hurricane Season) and our EISO can support active CDC responses to public health emergencies. Our EISO can also participate in field investigations in collaboration with embedded state and local Career Epidemiology Field Officers (CEFOs, many of whom are EIS alumni). ASEB also collaborates closely with epidemiologists in DSLR's Capability Building Branch; this close relationship will provide access to other potential project opportunities for the EISO.

Current Work: Epidemiologic investigation of unexplained events amongst US personnel living and working in Havana, Cuba and Guangzhou, China.

Zika -- CDC Emergency Operations Center

Hurricane Harvey -- deployed for Houston investigation of mold-related health issues

Hawaii False Missile Alert -- social media mining

Proposed Initial Projects: All of the projects described in the Proposed Analytic Project section make use of existing data and the EISO can expect to start working on any of them within the first month in the assignment

Proposed Analytic Project:

1.

1. Assess the ability to deliver medical countermeasures (MCM) during large-scale public health emergencies using data from a structured evaluation tool administered to over 130 US state and local jurisdictions. Data informs factors affecting MCM rapid delivery and results inform best practice recommendations. Officer will also have the opportunity to attend a site-visit and participate in an evaluation of a state or local preparedness program.

2. Use the analyses from the MCM project analysis above to develop a new scoring algorithm for the evaluation tool used to assess the nation's ability to deliver MCM within state and local health departments.
3. Analyze clinical information collected from US Government personnel working in Cuba or China who reported nonspecific symptoms, which included but were not limited to vestibular (balance) deficits, oculomotor (eye movement) deficits, headaches, anxiety, sleep impairment, tinnitus (ear ringing), ear pain, and cognitive deficits. Some persons also reported experiencing auditory and sensory phenomena in their hotel rooms or homes.

ASEB has staff with very strong analytic and research skills from a variety of disciplines (epidemiology, behavioral science, economics, and evaluation). This cadre of experts can rapidly develop appropriate protocols and data analysis plans as emergent public health investigation needs arise.

Proposed Field Investigation Project:

1. Collaborate with Field Services Branch on a project with a state or local health department under the supervision of a CEFO. Examples include design and implementation of a Community Assessment for Public Health Emergency Response (CASPER) to prepare for or respond to a disaster, an infectious disease outbreak investigation, and an emergency preparedness exercise or training event. During March--June 2020, the EIS officer will assist the Career Epidemiology Field Officer in Alabama in planning, organizing and leading a CASPER to collect and analyze data about community preparedness and other public health issues of concern in a local jurisdiction. This is an annual activity conducted by the Alabama preparedness program.
2. Opportunities also exist to participate in public health emergency preparedness operational readiness reviews of state, territorial, and local health departments and to respond to major public health emergencies.
3. Previous officers deployed to West Africa for Ebola response and Houston, TX for hurricane/flood response.

ASEB works directly with 50 states, 4 directly funded cities, 5 territories, and 3 independent nations affiliated by treaty with the United States. FSB has over 50 field staff assigned to multiple health departments. Any projects with FSB will be completed in close collaboration with health department staff. We also closely collaborates with non-governmental organizational partners including the Association of State and Territorial Health Officers (ASTHO) and the National Association of County and City Health Officials (NACCHO).

Proposed Surveillance Project:

1. 1. Evaluate a statewide syndromic surveillance system (through our close collaborative relationship with Career Epidemiology Field Officers in state health departments) and its ability to detect a public health condition of importance with input from state and local partners.
2. Evaluate select diseases reported to ASEB through the Public Health Emergency Preparedness (PHEP) cooperative agreement from 2011 to 2017. The evaluation will compare case counts in the PHEP data to case counts reported to the National Notifiable Disease Surveillance System (NNDSS) to determine accuracy, timeliness, and usefulness of PHEP reporting as a proxy for emergency surveillance capabilities.

Current Position Data:

ASEB is rich in both quantitative and qualitative data. Datasets include Public Health Emergency Preparedness application, performance, and evaluation data; medical countermeasures assessment of state and local health departments and application and evaluation data from the Crisis Cooperative agreement, a mechanism to distribute congressional appropriations for public health emergencies. Currently, state and local health departments are receiving funds through this mechanism for response to the Opioid Crisis and for reconstitution of public health services following the 2017 Hurricane Season.

Position Strengths: ASEB is a dynamic branch with wide reach and a diverse cadre of professionals eager to teach and mentor. Supervisors and Branch Chief are committed to EIS as demonstrated by over 20 years combined experience mentoring EISOs, and will provide a flexible experience tailored to the EISO's goals and interests. The Branch Chief has previously served as the Associate Director of the EIS program and is committed to providing a high quality-learning environment. The EISO will leave this position with strong epidemiology skills, a scientific portfolio, and experience in public health emergency preparedness and response.

Staff & Resources: ASEB is a multi-disciplinary branch of epidemiologists, program evaluators, psychologists, sociologists/anthropologists, data managers, clinicians, and health economists. FSB includes medical and veterinary supervisory epidemiologists in Atlanta in addition to senior field-based epidemiologists. Branch leadership is extremely committed to EIS officer professional development and dedicates branch resources commensurate with that commitment.

Special Skills Useful for this Position: The following skills are useful but not required for this position:

Critical thinking and application of scientific principles to complex problems

Data management and analysis (strong quantitative and/or qualitative)

Applied program evaluation

Performance measurement and metric development

Written and oral communication skills

Research project organization and management

Strong ability to work independently and in groups

Self- motivation and the ability to meet deadlines

Domestic Travel: 10% **International Travel:** 0%

National Center on Birth Defects and Developmental Disabilities

The National Center on Birth Defects and Developmental Disabilities (NCBDDD) has a host of great opportunities available for incoming EIS Officers. Currently, NCBDDD includes three divisions: the Division of Congenital and Developmental Disorders, the Division of Human Development and Disability, and the Division of Blood Disorders. Our Center aims to identify the causes and risk factors for birth defects and developmental disabilities; help children to develop and reach their full potential; and promote health and well-being among people of all ages with disabilities, including blood disorders.

NCBDDD-DCDD-PRTB-Georgia-2019-01

Primary Supervisor: Lorraine Yeung, Medical Officer, EIS 2002

- LYeung@cdc.gov

Secondary Supervisor(s):

- Krista Crider, Health Scientist (Geneticist)
- Cara Mai, Health Scientist

Background: Birth defects are major causes of infant morbidity and mortality. The Prevention Research Team conducts research, evaluation, health communication, and education efforts to prevent birth defects -- in particular, neural tube defects (NTDs). NTDs are a significant cause of infant death and major physical and cognitive disability worldwide. Conclusive research has shown that daily folic acid use can reduce a woman's risk for having a pregnancy affected by a neural tube defect. The current focus of our Team is to aid in efforts to quantify the burden of NTDs domestically and abroad and to provide technical assistance for the prevention of NTDs through intake of folic acid by reproductive-age women. Some of the ways in which we achieve this is by assisting Ministries of Health to develop birth defects surveillance, to increase laboratory capacity for measuring red blood cell folate globally, to work collectively with countries and global partners to provide technical assistance for fortification initiatives and implementation of national plans, and to monitor the safety of folic acid. In addition, the Team has been involved in the CDC response to the use of the antiretroviral dolutegravir among pregnant women and a possible link to NTDs.

Current Work: Field: Evaluating a fortification project/participating in birth defects surveillance training internationally; Epi-Aid on possible association of dolutegravir exposure among women with HIV and neural tube defects (NTDs) in Botswana;
Analytic: Defining plasma folate concentration associated with red blood cell folate concentration threshold for optimal NTDs prevention;
Evaluations: Zika surveillance systems

Proposed Initial Projects: The choice of projects is flexible. Within the first month, the EISO can:
(1) Begin a surveillance evaluation (key informants are in our Division and the officer could begin reading documentation, meeting with staff, and drafting questions to ask of key stakeholders);
(2) Begin analysis of already available NHANES data. Potential analyses include: association of acculturation factors on usual folic acid intakes and associated biomarkers, optimal red blood cell folate status and predictions of NTD risk by acculturation factors among Hispanic women of childbearing age, and prevalence of known risk factors for birth defects among U.S. women of childbearing age.

Proposed Analytic Project:
Using cross-sectional data from the National Health and Nutrition Examination Surveys (NHANES), the EISO can examine factors that affect folic acid intake among sub-groups of U.S. women of reproductive age who remain at risk of having a neural tube defect affected pregnancy. The EISO can also assess the prevalence of known risk

factors for birth defects (e.g., pregestational diabetes, smoking, obesity) among U.S. women of childbearing age. The EISO will have an opportunity to use NHANES data to conduct analyses on health outcomes related to folic acid safety by linking NHANES data with administrative data including the National Death Index as well as Medicare and Medicaid enrollment and claims records. As folate metabolism and neural tube defects risk have a critical genetic contribution, EISO will also have an opportunity to use these datasets along with newly available data on genetic samples funded by our Team to assess the interaction of folic acid intake and genetic variations in folate metabolism on various biomarkers and health outcomes. EISO will have the opportunity to use multivariate modeling, logistic regression, complex samples, and Markov Chain Monte Carlo Simulation in these analyzes. NHANES data are publicly available so no protocols are necessary. Finally, the EISO will also have the opportunity to develop his or her own ancillary research questions that could be answered using NHANES or other available datasets for publication in peer reviewed journals.

Proposed Field Investigation Project:

EISOs in the division have recently participated in Epi-Aids or field investigations in areas such as the 2016 Zika response deployment to the Emergency Operations Center, neonatal abstinence syndrome surveillance, antiretroviral medication dolutegravir (DTG) and neural tube defects (NTDs) in Botswana, and evaluation of a maize flour fortification project in medium scale mills in Tanzania. As we continue to examine the potential relationship between DTG and NTDs, we anticipate potential field investigation opportunities in working with selected African countries. For example, the EISO can assess how well a birth defects surveillance program in Kenya or Tanzania can be scaled to address a public health concern, such as the DTG/NTD relationship. Another project could examine a birth defects surveillance system's transition from paper to electronic data collection from multiple health care facilities across a country in limited resource settings.

In addition to field investigations originating in NCBDDD, the supervisory team is very supportive of the EISO participating in Epi-Aids and emergency response deployments from other Centers to provide a broader experience if desired by the EISO.

The EISO will have extensive opportunities to collaborate with both clinical and public health partners at regional, national, and international levels. Our Team has on-going collaborative projects with the World Health Organization (WHO) and its regional offices, such as the South-East Asia Regional Office (WHO-SEARO); country-level ministries of health (MOH); clinicians and other staff at health care facilities and hospitals who are involved with birth defects and biomarker surveillance projects in Asia and Africa. For example, the EISO could participate as part of the training team, in conjunction with the MOH Field Epidemiology & Laboratory Training Program (FELTP) or maternal and child health staff, to train clinicians and other staff on how to conduct birth defects surveillance, including data quality assessment, and data utilization. Another area for involvement could include assisting our Team and our MOH partners in Tanzania to examine the data collected for biomarker monitoring.

Proposed Surveillance Project:

The South-East Asia Regional Newborn Birth Defects Database (SEAR-NBBD) was established by the WHO South-East Asia Regional Office (WHO-SEARO), with support from CDC NCBDDD, in 2014. This online hospital-based birth defects surveillance system allows for the ongoing systematic collection and analysis of birth defects data from each of the seven participating member states. Our Team is currently conducting a process evaluation of the system to inform program improvements. The immediate next steps are to conduct an evaluation of data quality (completeness, accuracy, and timeliness) and other agreed upon attributes from CDC's evaluation framework. The EISO could conduct such an evaluation of a network of participating SEAR-NBBD hospitals, likely in India or Bangladesh, which have been collecting data since 2014. This evaluation would require field evaluation of the hospitals being evaluated.

Other possible surveillance evaluations that the EISO could conduct are: 1. An evaluation of the infant/child follow up in the US Zika Pregnancy and Infant Registry to assess the strengths and limitations of this innovative longitudinal-linked surveillance; 2. An evaluation of a relatively new surveillance system to capture adolescents and adults with congenital heart disease using multiple administrative data sources, and 3. An evaluation of the

Metropolitan Atlanta Congenital Defects Program (MACDP), which is administered by CDC's Birth Defects Branch. It is the longest-running active birth defects surveillance program in the U.S., with data collection beginning in 1968. MACDP data abstractors review medical records in 27 metro-Atlanta hospitals and clinics to identify eligible cases.

Current Position Data:
Our Team has on-going analytic projects using NHANES and HealthStyles. Both NHANES and HealthStyles data are readily available for the officer. In addition, the EISO would be able to analyze data coordinated by and housed in the Birth Defects Branch, including case-control data from the National Birth Defects Prevention Study and surveillance data from the Metropolitan Atlanta Congenital Defects Program.
Position Strengths: Large data sources; strong epidemiological support with award-winning scientists and mentors; strong clinical mentors in pediatrics, internal medicine, preventive medicine, clinical genetics, obstetrics/gynecology, and nursing; strong ties to the World Health Organization and international birth defects monitoring programs; opportunity to engage in both analytic and international programmatic activities and participate in cross-agency collaborations; family-friendly, supportive and collaborative work environment.
Staff & Resources: Staff with clinical expertise in pediatrics, internal medicine, preventive medicine, clinical genetics, obstetrics and gynecology, and nursing are among our supervisors and consultants. In addition, we have several highly skilled epidemiologists and health scientists with expertise in study design and implementation, data management and analysis, birth defects surveillance, and program implementation. There are several mathematical statisticians in the Division and Center available for consultation on more complex analyses.
Special Skills Useful for this Position: Interest in maternal and child health, and strong communication skills. Clinical (pediatrics, family practice, internal medicine, preventive medicine, obstetrics/gynecology, nursing, etc.) or genetics experience is helpful but not necessary. Interest in birth defects and nutrition is helpful, but not necessary. Experience in SPSS, SAS, or other statistical software programs is useful, but not required. Although data analysis experience will enable the EISO to begin analytic projects earlier, supervisors will ensure that any EISO without this experience receives substantial support and training in statistical programming and epidemiologic methods.
Domestic Travel: 5% **International Travel:** 10%

NCBDDD-DCDD-PRTB-Georgia-2019-02

Primary Supervisor: Shin Kim, Team Lead

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Secondary Supervisor(s):

- Kate Woodworth, Medical Officer, EIS 2015
- Suzanne Gilboa, Branch Senior Scientist

Background: The Prevention Research and Translation Branch is "dedicated to improving the lives of babies, children and families with integrity, collegiality and passion for scientific and programmatic excellence." The EISO's primary supervisor is from the Prenatal, Alcohol, Opioid and Substance Exposure Team (PAOSET) and secondary supervisor is from the Emerging Threats Team (ETT).

PAOSET focuses on reducing alcohol exposed pregnancies through implementation of alcohol screening and brief intervention in clinical care; understanding fetal alcohol spectrum disorder and other prenatal alcohol related conditions; surveillance and research around opioid use during pregnancy and the potential adverse maternal and child health outcomes associated with use; and polysubstance use in pregnancy and associated outcomes.

ETT's mission is to: 1) support and lead surveillance and research projects related to Zika virus infection during pregnancy, domestically and internationally; and 2) facilitate data analysis and provide technical assistance to jurisdictions affected by the fall 2017 hurricanes, to examine potential adverse outcomes to mothers and babies. ETT's scope also includes emergency preparedness and response, focused on pregnant women and children. The team is developing a framework for a rapid surveillance system to monitor exposures during pregnancy and their impacts on the health of mothers and babies.

Current Work: Field: Epi-Aid on possible association of dolutegravir exposure among women with HIV and neural tube defects in Botswana; technical assistance to states on neonatal abstinence syndrome surveillance
Analytic: ADHD medication use among women of reproductive age
Surveillance evaluations: Zika surveillance systems (n=3; Colombia and US systems); CDC's Pregnancy Flu Line

Proposed Initial Projects: In the first month, the EISO would:

(1) Begin a surveillance evaluation. For all examples noted above, key informants are in our Division and the officer could begin reading documentation, meeting with staff, and drafting questions to ask of key stakeholders.

(2) Begin an analysis of one of several data sources that are ready and available: National Birth Defects Prevention Study, HealthStyles/DocStyles, National Survey of Family Growth, Behavior Risk Factor Surveillance System, MarketScan, US Zika Pregnancy and Infant Registry, Zika Birth Defects Surveillance, or Colombia surveillance and research data.

Proposed Analytic Project:

This position has access to a wide array of rich data sources enabling the EISO to engage in several analytic projects during the fellowship. For example, we have access to large health insurance claims databases (e.g. MarketScan and Centene) and have several planned analyses to look at medication use among pregnant women and women of reproductive age, and document the incidence of neonatal abstinence syndrome and other adverse outcomes. In sample survey data (e.g., HeathStyles and DocStyles), we have questions that assess knowledge and perceptions of alcohol use in pregnancy that have been fielded and are ready to be analyzed. In our Zika-related surveillance datasets for the US states and territories and Colombia, we have information on pregnancies with laboratory evidence of Zika virus infection and birth defects and immediate pregnancy outcomes, as well as longer-term outcomes in growth and development. From our pregnancy cohort data in Colombia, we have questionnaire data, laboratory results, developmental assessments and data abstracted from medical records from pregnant women, male partners and children up to 18 months of age. We have a robust scientific agenda with analytic questions that we would like to answer using these data -- and the EISO would also have the opportunity to develop his or her own ancillary research questions that could be answered using our available datasets for publication in peer reviewed journals.

Proposed Field Investigation Project:

There have been opportunities in recent years for EISOs in NCBDDD to lead or participate in Epi-Aids or field investigations in our content area (e.g., anencephaly cluster in Washington State; screening for critical congenital heart defects in Georgia and New Jersey; 2016 Zika response deployment to the Emergency Operations Center and Colombia; dolutegravir and neural tube defects in Botswana; neonatal abstinence syndrome surveillance in several states). In addition to field investigation opportunities originating in NCBDDD during the EISO's tenure, the supervisory team is very supportive of the EISO participating in Epi-Aids and emergency response deployments from other Centers to provide a broader experience if desired by the EISO. The EISO would have extensive opportunities to collaborate with both clinical and public health partners.

For example, the EISO will have the opportunity to engage with the Council of State and Territorial Epidemiologists (CSTE) on the potential revision of the congenital Zika infection case definition as part of work in ETT. Currently, staff of PAOSET are involved in discussions with CSTE around the case definition for neonatal abstinence syndrome. On ETT there are frequent opportunities for engagement with state and local health departments either on collection of follow-up data on infants born to mothers with laboratory evidence of Zika virus infection in pregnancy or in providing technical assistance to understand the impact of the 2017 hurricanes

on pregnant women and infants. PAOSET has a strong collaborative relationship with the Administration for Children and Families (part of HHS) on a research project focused on understanding the child welfare system's response to prenatal substance exposure, with an emphasis on prenatal alcohol exposure and resulting conditions. In addition, the team works closely with its grantees, which include universities, healthcare systems, and clinical professional organizations to extend the use of screening and brief intervention in the prenatal care setting to identify the potential for alcohol-exposed pregnancies. Both teams engage with clinical partners extensively, including the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

Proposed Surveillance Project:

There are several possible surveillance evaluations that the EISO could conduct to meet this CAL.

One option is an evaluation of the infant/child follow up in the US Zika Pregnancy and Infant Registry to assess the strengths and limitations of this innovative longitudinal-linked surveillance.

Another possibility is an evaluation of a relatively new surveillance system to capture adolescents and adults with congenital heart disease using multiple administrative data sources.

Lastly, the Metropolitan Atlanta Congenital Defects Program (MACDP), which is administered by CDC's Birth Defects Branch, is the longest-running active birth defects surveillance program in the U.S., with data collection beginning in 1968. MACDP data abstractors review medical records in 27 metro-Atlanta hospitals and clinics to identify eligible cases. Data undergo a rigorous quality assurance and clinical review processes to ensure the highest data quality. The length of the surveillance program and the evolution of its methodologies over time provide a unique surveillance evaluation opportunity.

All of these evaluations could be conducted from Atlanta without the need for site visits or a field evaluation; however, the evaluation of the US Zika Pregnancy and Infant Registry might be strengthened by including at least one site visit. For the MACDP evaluation, visits to metro-Atlanta hospitals and clinics might be useful for selected aspects of the evaluation. For all 3 options, the EISO will be able to interview jurisdictional stakeholders either by phone or email exchange.

Current Position Data:

PAOSET has on-going analytic projects using DocStyles and HealthStyles, Behavior Risk Factor Surveillance System, MarketScan, Centene, and the National Survey of Family Growth. ETT has data on Zika virus infection in pregnancy and infant outcomes: US Zika Pregnancy and Infant Registry, Zika Birth Defects Surveillance, Vigilancia de Embarazadas con Zika (Colombia surveillance data) and Zika en Embarazadas y Ninos (Colombia research cohort). In addition, the EISO would be able to analyze data coordinated by and housed in the Birth Defects Branch, including case-control data from National Birth Defects Prevention Study and surveillance data from the Metropolitan Atlanta Congenital Defects Program.

Position Strengths: Strong support for epidemiology training with award-winning scientists and mentors; strong clinical mentors in pediatrics and obstetrics/gynecology; unique opportunity to network and collaborate with colleagues within NCBDDD and across CDC, including NCEZID and NCIRD; strong collaborative partnerships with several federal agencies (e.g., FDA, NICHD, ACF, SAMHSA) and clinical and public health organizations (e.g., March of Dimes, National Birth Defects Prevention Network, CSTE, NACCHO, AMCHP, AAP, ACOG); wide breadth of opportunities as noted in the previous question; family-friendly, supportive, and collaborative work environment. Opportunities are available for international projects.

Staff & Resources: Staff with clinical expertise in pediatrics, clinical genetics and obstetrics and gynecology are among our consultants. In addition, we have several highly skilled epidemiologists with expertise in study design and implementation, as well as data management and analysis. There are several mathematical statisticians in the Division and Center available for consultation on more complex analyses.

Special Skills Useful for this Position: Interest in maternal and child health, and strong communication skills. Clinical (OBGYN, pediatrics, family practice, nursing, etc.), or pharmaceutical/pharmacologic/pharmacoepidemiology experience is helpful but not necessary. Interest in

substance use and abuse, infectious diseases during pregnancy, and/or emergency preparedness and response is helpful, but not necessary. Although data analysis experience will enable the EISO to begin analytic projects earlier, supervisors will ensure that any EISO without this experience receives substantial support and training in statistical programming and epidemiologic methods.
Domestic Travel: 5% **International Travel:** 5%

National Center for Chronic Disease Prevention and Health Promotion

Chronic diseases, such as heart disease, stroke, cancer, diabetes, arthritis, are the nation's leading causes of death and disability; 86% of our healthcare dollars goes to treatment of chronic diseases. CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) is at the forefront of the nation's efforts to prevent and control chronic diseases. NCCDPHP's eight divisions support efforts to prevent chronic diseases and promote health by targeting four key action areas: epidemiology and surveillance; environmental approaches that promote health and support and reinforce healthful behaviors in schools, worksites, and communities; health care system interventions to improve the effective delivery and use of clinical and other preventive services; strategies to link community programs to clinical services so that communities support and clinics refer patients to programs that improve management of chronic conditions.

NCCDPHP-DCPC-EARB-Georgia-2019-01

Primary Supervisor: Jin Qin, Epidemiologist, EIS 2014

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Secondary Supervisor(s):

- Susan Sabatino, Medical Officer
- David Siegel, Medical Officer, EIS 2016

Background: The Division of Cancer Prevention and Control (DCPC) is a leader in national efforts to develop, implement, and promote effective strategies for preventing and controlling cancer. We describe and address national and state-specific cancer burden, prevention strategies, disparities, and cancer survivorship. DCPC's teams include epidemiologists, economists, behavioral scientists, and communicators who synthesize scientific evidence and evaluate interventions, programs, policy and practice; and provide subject matter expertise to translate research into practice. DCPC's National Program of Cancer Registries (NPCR) receives data on more than 1.6 million cancer cases and produces the U.S. Cancer Statistics annually. The Epidemiology and Applied Research Branch (EARB) does independent and innovative research and provides technical, scientific and translational services to other initiatives within the Division, including DCPC's National Breast and Cervical Cancer Early Detection Program and Colorectal Cancer Control Program, the largest cancer screening programs in the country serving medically underserved, low-income populations. In 2018, EARB produced 33 first-authored and 48 coauthored publications, with many receiving considerable media attention. We provide EIS officers opportunities to learn or advance analytic skills while deepening their understanding of population health and prevention. For further information, please visit: http://www.cdc.gov/cancer/dcpc.htm.
Current Work: Evaluation of national cancer surveillance system's capacity to capture tobacco use; Descriptive study on racial disparities in survival among children with brain and CNS cancer; Examination of rates and trends of HPV-associated cancers; Examination of preventive care services utilized by adolescent and young adult cancer survivors.
Proposed Initial Projects: HPV typing of cancers
The project would include examining a special linkage of select cancer registry data with HPV DNA from two study periods (2004--2005 and 2014--15). Cancers include cervical, vaginal, vulvar, anal, penile, scrotal and oropharyngeal cancers. The EISO can examine several issues related to HPV typing of cancers including analyzing HPV genotype by histology. Findings will be important in monitoring HPV prevalence in cancers as well as characterizing HPV genotype by specific cell type.

Childhood cancers
Epidemiologic investigation on geographic variations of pediatric cancer, second cancers, or disparities in mortality and survival using NPCR data.

Proposed Analytic Project:

Project 1: HPV-associated cancers

Characterizing HPV-associated cancers is a priority for multiple divisions as it has implications to interventions by states to promote HPV vaccine coverage and cervical cancer screening. Given the high priority and profile of these cancers, an EIS officer would be crucial for us to help characterize the burden, trends, and epidemiology of these cancers especially cervical, anal, and oropharyngeal cancers. The findings could inform Advisory Committee on Immunization Practices (ACIP) recommendations, and be presented at meetings that influence health policies (e.g. ACIP meeting, HPV Roundtable). This project may involve analytic methods including multivariable regression and survival analysis.

Project 2: Childhood cancers

Congress passed the STAR Act during the summer of 2018 that calls upon CDC to enhance its ability to track the epidemiology of cancer in children, adolescents, and young adults, which expands a previously existing pediatric Early Case Capture program. In the 2019 State of the Union address, President Trump called for enhanced research on childhood cancers in the next 10 years. An EIS officer can help meet these developing CDC needs by participating in the evaluation and enhancement of cancer surveillance systems related to pediatric cancer and can use available CDC cancer data to report on the epidemiology of pediatric and young adult cancer. This project may involve analytic methods including trend analysis, multivariable regression and geospatial analysis.

In addition to these projects, the EISO will develop their own analytic projects that best fit their interests and goals and fulfill EIS training objectives (CALs).

Proposed Field Investigation Project:

We consider field epidemiology investigation as a fundamental and essential training component for EIS officers, and we fully support our EISOs participating in Epi-Aids and emergency response deployments, including field investigations and deployments sponsored by other centers. For example, our recent EISOs participated in Zika virus response and an invasive group A strep Epi-Aid. Potential field opportunities within DCPC include working with our Indian Health Service field assignees in Albuquerque, NM or with a state central cancer registry on an evaluation or enhancement project. There will also be potential field investigation opportunities for many of our programs with local partners and collaborators.

EISOs have opportunities to collaborate with other CDC divisions and centers, federal partners, non-governmental organizations, and other public health partners through field investigations and various projects available. For example, the EISO will have opportunities to collaborate with state cancer registries who participate in DCPC coordinated projects. Our recent EISOs conducted a chart review/audit to assess completeness of Louisiana cancer registry's collection of precancerous cervical lesions (site visit), and worked with the California, Colorado, and Kentucky cancer registries on the biomarker and pediatric cancer projects (sit visits and phone calls). The EISO will also interact with other collaborators, such as clinical research organizations. For example, our recent EISO interacted with the Children's Oncology Group for his projects.

Proposed Surveillance Project:

EIS officers will have the opportunity to evaluate a specific aspect of NPCR, DCPC's population-based cancer registries in 46 states, 3 territories, and the District of Columbia. Potential projects include focusing on the direct capture of biomarker data from pathology laboratories or exploring the capture of cervical cancer precursor data and outcomes directly related to cervical cancer prevention programs. Officers could also evaluate state cancer registries' ability to capture pre-treatment height and weight and comorbidities, and their relation to breast or colorectal cancer incidence, stage at diagnosis, histologic variation, treatment and/or outcomes. Officers could evaluate DCPC's pediatric cancer surveillance programs related to the congressional mandate to increase the speed of pediatric cancer reporting to state cancer registries. EISOs will have opportunities to visit a hospital registry, reporting laboratory, and/or state central cancer registry.

Current Position Data:

United States Cancer Statistics (USCS)

National Program of Cancer Registries (NPCR)
Behavioral Risk Factor Surveillance System (BRFSS)
National Health Interview Survey (NHIS)
National Survey of Family Growth (NSFG)
MarketScan claims database
Position Strengths: EARB epidemiologists and statisticians have extensive experience in analyzing data from complex national surveys and NPCR. We will provide strong support for EISOs to develop subject matter expertise and advanced data analysis skills. EISOs will also develop scientific writing skills for publications on peer-reviewed journals and MMWR reports. Our branches work collaboratively with all programs within the division, and the branches will collectively provide support to the EISO. Colleagues are knowledgeable, friendly, and accessible.
Staff & Resources: EARB offers friendly statistical support. DCPC has a robust communication team able to help officers develop a strategy and messages to increase the reach of their work. In addition, we support learning through CDC University to meet specific learning objectives.
Special Skills Useful for this Position: Communication (written and oral) skills, data analysis skills are desirable but not required. Training appropriate to the skills and projects of the EISO can be provided. DCPC is committed to mentoring incoming EIS officers to ensure they receive the necessary skills and proficiencies outlined in the EIS CALs, as well as those related to professional career trajectories in public health.
Domestic Travel: 5% **International Travel:** 0%

NCCDPHP-DNPAO-NB-Georgia-2019-01

Primary Supervisor: Heather Hamner, Health Scientist

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Secondary Supervisor(s):

- Jennifer Nelson, Medical Epidemiologist, EIS 2014
- Cria Perrine, Team Lead, EIS 2008

Background: The Maternal, Infant, and Toddler Nutrition Team works to improve health and development through optimal nutrition from pregnancy through the first two years of life. We provide technical assistance, education, and training to states, communities, healthcare providers, and families. We conduct surveillance and research to support nutrition and health policy and to guide programmatic efforts. Lastly, we work with partners to develop, harmonize, operationalize and disseminate nutrition guidance and policies.
Major activities of the team include:
- facilitate the implementation of policies and environmental changes that support optimal maternity care in hospitals and young child feeding practices in workplaces, pediatric provider settings, child care centers, and the community;
- assess hospital practices and policies related to breastfeeding in all birth facilities in the US;
- identify environmental and policy determinants of maternal, infant, and toddler nutrition;
- conduct research and surveillance on maternal nutrition, and infant and toddler feeding practices and their association with health outcomes including child development, obesity and other chronic diseases; and
- synthesize evidence, develop recommendations, and disseminate information on best practices to promote healthy behaviors for mothers and young children.

Current Work:
- Analysis of:
o Hospital practices that support breastfeeding, maternity leave, breastfeeding outcomes
o Predictors of coverage and intake of micronutrient powders

o Pediatric knowledge of nutrition recommendations
o Nutrient content of foods targeting children
- Investigations of Neonatal Abstinence Syndrome, Ebola, Zika, adolescent suicide
- International nutrition-related field projects

Proposed Initial Projects: Initial project will be dependent upon EISO interest. Projects could include:
- analyze WIC programmatic administrative data to determine the double burden of anemia and obesity,
- analyze nationally-representative longitudinal data from WIC Infant and Toddler Feeding Practices Study:
o Assess impact of maternity care practices on infant feeding outcomes,
o Assess breastfeeding support provision and link to breastfeeding duration,
o Assess impact of WIC support on infant and toddler nutrition, or
o Assess the impact of child care arrangements on infant and toddler feeding outcomes; or
- analyze national level data from NSCH on child health and behavioral outcomes.

Proposed Analytic Project:
Data analyses will range from descriptive analyses to more complex analyses that examine the relationship between various young child feeding practices and behaviors and their link to later health behaviors or health outcomes. Examples include:

- Analyze national-level data from NHANES for women, infants, and toddlers:
o Assessment of dietary patterns of key food groups,
o Assessment of usual dietary intake of key nutrients using complex nutrition modeling methods,
o Assessment of nutritional status for key micronutrients, or
o Assessment of dietary practices or behaviors and their association with health outcomes.
- Analyze nationally-representative longitudinal data from WIC Infant and Toddler Feeding Practices Study:
o Assess impact of maternity care practices on infant feeding outcomes,
o Assess breastfeeding support provision and link to breastfeeding duration,
o Assess impact of WIC support on infant and toddler nutrition, or
o Assess the impact of child care arrangements on infant and toddler feeding outcomes.
- Analyze national level data from NSCH on early child health and behavioral outcomes
- Analyze national level data from NSFG on health care provider counselling received on early child feeding
- Analyze a census of WIC participants to determine anemia status of pregnant women
- Analyze a census of US birth hospitals (mPINC) to determine current breastfeeding supportive policies and practices
- Use linked birth and death certificate data to assess the association of breastfeeding with infant mortality.

Opportunity to do analyses using a variety of statistical techniques (e.g., multiple logistic regression, generalized estimating equation modeling).

Proposed Field Investigation Project:
EISOs have the opportunity to work within our Nutrition Branch with the International Micronutrient Malnutrition Prevention and Control Team (IMMPaCt). This team conducts both international and domestic work on micronutrient evaluations across a variety of countries. The EISO assigned to the Maternal, Infant, and Toddler Nutrition Team would have the opportunity to work on a project with the micronutrient team, if desired. Previous officers have participated in field investigations in Kyrgyzstan, Guatemala, and the Republic of Georgia.

We are fully supportive of the EISO being involved in field investigations, Epi-Aids, or other responses in our Center as well as other Centers. Previous EISOs have participated in investigations of Neonatal Abstinence Syndrome, the Ebola and Zika virus responses, and adolescent suicide.

In addition, we fully support and assist EISOs to explore other opportunities for primary data collection, which may include:

- Conducting a chart review of select birth hospitals to validate our Maternity Practices in Infant Nutrition and Care (mPINC) surveillance system,
- Working with USDA's WIC Program to more fully understand blood collection processes and the potential to use administrative program data as a surveillance system.

The EISO will have multiple opportunities to interact with public health partners, including but not limited to:

- Federal partners (such as USDA's WIC Program, FDA, NIH): Our team works with federal partners on all major activities. We co-lead the Federal Data Consortium on Pregnancy/Birth to 24 months (P/B24) which includes 27+ federal agencies that work to identify and coordinate projects to advance the collection of nutrition data among P/B24 populations and to ensure the alignment with agency priorities. In addition, we are part of a collaborative of federal partners (NIH, USDA, CDC) and Robert Wood Johnson Foundation whose aim is to accelerate progress in reducing childhood obesity. EISOs would have the opportunity to develop and lead projects and to present findings.
- State and local communities: Opportunities to provide subject matter expertise or technical assistance to our state and local grantees who work to promote and support breastfeeding efforts within hospitals, worksites, and communities. EISOs could work on specific tools and resources that translate evidence-based research into practice.
- Non-governmental organizations (such as the American Academy of Pediatrics, U.S. Breastfeeding Committee, 1,000 Days): These organizations work on projects ranging from providing pediatric clinical support to implement optimal nutrition recommendations to developing videos for new parents on infant and toddler feeding.

EISO's role would differ based on the partner; however, EISO could expect to work as a subject matter expert and provide technical assistance, develop and present information and/or training to partners on CDC activities or efforts, or lead projects.

Proposed Surveillance Project:

Options include:

- evaluation of the National Survey of Children's Health as a way to monitor key early child nutrition indicators;
- evaluation of the potential impact to breastfeeding rates occurring during the transition from dual-frame sampling to cell phone-only sampling in the National Immunizations Survey; or
- evaluation of using birth certificate data (National Vital Statistics) to assess breastfeeding practices at hospital discharge.

Officers will gather input from appropriate stakeholders and partners (i.e., national organizations, state health departments, hospitals, professional clinical organizations). EISO will likely conduct desk review of methods and consult via phone with stakeholders, as required.

Current Position Data:

Data sources available that the team owns:

- Maternity Practices in Infant Nutrition and Care (mPINC) survey, and
- Infant Feeding Practices Study II and its Year 6 Follow-Up Study.

Other data sources that are available on day one, but the team does not own:
- National Immunization Survey (NIS),
- National Health and Nutrition Examination Survey (NHANES),
- National Survey of Children's Health (NSCH),
- National Survey of Family Growth (NSFG),
- WIC Infant and Toddler Feeding Practices Study
- FoodAPS,
- HealthStyles, among others.

Position Strengths: EISOs can expect to work on projects that inform program and policy efforts, use a range of data sets to improve analytic skills and enhance statistical techniques, and lead different activities. The Team has a strong history of supervising EISOs. Supervisors have years of experience and consultants are EIS alumni. Strong team cohesion with expertise in statistical, programmatic, nutrition, medical, and epidemiologic fields. Strong support of EISOs' participation in conferences, Agency-wide and EIS-specific emergency responses. Branch commitment to translation of epidemiologic research for public health action and ability to do projects across teams, including domestic and international work, as desired.
Staff & Resources: The Nutrition Branch will provide epidemiologic support, guidance, and mentoring from the EISO supervisors as well as staff epidemiologists and health scientists that include EIS alumni. We also have a Branch SAS programmer to provide SAS support. We have a strong history of collaboration with staff across our Branch, Division, CDC and outside partners who have appropriate expertise or support on projects.
Training is available as needed.

Special Skills Useful for this Position: Skills in designing, implementing, and analyzing complex surveys; nutrition/micronutrient content, statistical knowledge and SAS and/or SPSS programming skills would be helpful but are not required.

We have a strong history of successful EISOs who had backgrounds ranging from nutrition, epidemiology, medical training (e.g., pediatrics, pharmacy), maternal and child health, behavioral scientists, etc. Our objective is to capitalize on the strengths the EISO brings and build strengths in other areas.

Domestic Travel: 5% **International Travel:** 5%

NCCDPHP-DNPAO-NB-Georgia-2019-02

Primary Supervisor: Andrea Sharma, Nutritional Epidemiologist, EIS 2004
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Secondary Supervisor(s):
- Maria Elena Jefferds, Team Lead, EIS 2001

Background: The International Micronutrient Malnutrition Prevention and Control Team (IMMPaCt) works with global partners to contribute CDC skills and resources to eliminate vitamin and mineral deficiencies among vulnerable populations throughout the world. IMMPaCt provides technical support to countries to develop and operate appropriate assessment, monitoring, and evaluation systems, and implement interventions, such as mass food fortification, supplementation, and home fortification.
IMMPaCt focuses on iodine, vitamin A, zinc, folic acid and iron deficiencies in low and middle-income countries and iodine and iron deficiency in the U.S. Collaboration is ongoing with developing countries, UNICEF, WHO, USAID, World Food Programme, Nutrition International, Bill and Melinda Gates Foundation, and the Global Alliance for Improved Nutrition (GAIN).

Current Work: -Work with global/country partners to design, implement national micronutrient surveys and micronutrient interventions (mass/home fortification, supplementation) "" Rwanda, Nepal

- Evaluate surveillance systems, work with partners on improvements "" Republic of Georgia, Vietnam, US, WHO VMNIS
- Analyze data to inform national programs or global guidelines "" Guatemala, Nepal

Proposed Initial Projects: The initial project depend on EISO interest, but could include:

- Analysis of micronutrient survey data from Uganda or the US (NHANES)
- Analysis of program implementation data from Ghana, assist with preparations for upcoming survey
- Development of nutrition surveillance for micronutrient programs in one or more African countries
- Develop micronutrient assessment surveys or coverage surveys in various countries
- Develop methodology for reestablishing anemia surveillance among low-income pregnant women using data from WIC-PC
- Participate in the design and implementation of a workshop to strengthen monitoring and surveillance of nutrition specific programs in West Africa

Proposed Analytic Project:

Analytic projects will range from descriptive analyses of micronutrient status from national surveys using complex survey design methods to more complex analyses that examine etiology of disease, intervention effects, and predictors of program coverage. Examples of analytic projects include:

- Analyze data from the 2018 Uganda National Panel Survey nutrition module:
  - descriptive analysis of nutritional or health status using data from questionnaires, laboratory or anthropometry/blood pressure
  - evaluating data quality to drive improvement efforts
  - examining predictors of health status
- To inform global criteria to define anemia, examine associations between hemoglobin and altitude in school-age children, high-altitude populations, or U.S. populations through analysis of populations-based data such as BRINDA (Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia) and NHANES (National Health and Nutrition Examination Survey).
- Examine the influence of additional measures of inflammation (AGP) on the prevalence of iron deficiency in the US (NHANES)
- Evaluate EMR data sources to determine the validity of diagnostic codes compared to laboratory measurements for anemia and iron deficiency among pregnant women or young children
- Compare concordance between 2 women's dietary diversity questionnaires (Uganda, Guatemala)
- Nutritional predictors of anemia, determine if causes of anemia changed 2009--2017, Guatemala
- Examine factors related to practices, coverage, or intake in an iron, folic acid supplementation program to reduce anemia among school-aged girls, Ghana
- Due to efforts to fill data gaps and improve global guidelines across several priority areas, EISOs have ability to identify and conduct analyses related to their interests

Proposed Field Investigation Project:

Several opportunities for primary data collection including:

- Uganda, Burkina Faso (French speakers only), Rwanda, Nigeria, or Vietnam -- participate in the design and implementation of integrated nutrition surveillance systems or national micronutrient surveys
- Ghana or Bangladesh -- evaluation (mixed methods) of the iron-folic acid school interventions among adolescent girls
- Guatemala --institutionalization of the national integrated nutrition surveillance system (Spanish speakers)
- Chart abstraction to identify methods to determine iron treatment using EMR data in the US

EISOs are also encouraged to take advantage of any other opportunity to participate in Epi-Aids and emergency response deployments as they arise.

Examples of the Field Investigation CAL activities from previous EISOs:

- Evaluation of the Republic of Georgia Nutrition Monitoring and Surveillance System; Visited surveillance sites to assess recruitment processes, data collection methods, and laboratory protocols; Collaborated with nutritional subject matter experts, Georgian government officials, and other partners to improve the system and to use surveillance findings to inform governmental policies
- Implementation of district and national surveys (e.g., Tanzania, Nepal, Guatemala, Democratic Republic of Congo)
- Collected data on cold chain and laboratory capacity in Rwanda (to prepare for National Micronutrient Survey)
- Implementation of home fortification interventions (e.g., Kenya, Uganda, Mozambique)
- Trained field staff in Guatemala on collecting child anthropometric data using novel 3D technology and oversaw data collection processes during field testing
- Stakeholder assessment of the WHO Vitamin and Mineral Nutrition Information System

Nearly all of IMMPaCt's projects work with public health partners. These include government Ministries or Agencies, USAID, UNICEF, WHO, Technical Advisory Groups (e.g., Global Alliance for Vitamin A [GAVA], Home Fortification Technical Advisory Group [HF-TAG], Food Fortification Initiative [FFI]), universities, and NGOs. EISOs serve in a variety of ways depending on the project, such as: provide training, serve as a subject matter expert, lead project, evaluate/develop protocols, etc.

Proposed Surveillance Project:

The EISO can select among several options, including the evaluation of surveillance systems in the US, Uganda and Guatemala (or proposed designs in Rwanda and Burkina Faso) to monitor key nutrition and program indicators. Evaluation of the Uganda Nutrition Surveillance System would be timely as the first year of data collection was recently completed. The EISO would have opportunity to evaluate key indicators and advise on opportunities to implement system improvements for the 2020 data collection. The EISO will likely conduct a desk review of methods and consult via phone with partners and stakeholders, as required. Depending on timing and project, there may be opportunity to meet with in country stakeholders as part of evaluation or dissemination of findings.

Current Position Data:

Plenty of data immediately available with 20+ country micronutrient surveys, intervention monitoring, surveillance and other datasets as described throughout position description.

Position Strengths: Opportunities for country work, analytic work, publishing, and developing key skillsets transferable to other content areas. Work rewarding as it improves programs and informs policies and guidelines affecting vulnerable populations both internationally and domestically. Weekly one-hour meetings scheduled with primary supervisor, and an open-door policy as needed. Strong team cohesion with collaboration, support and expertise in nutrition, epidemiology, biostatistics, laboratory methods, behavioral health, with other technical support and consultation available as needed. Collaboration with SMEs within Center and across CDC common. Long, successful history working with EISOs.

Staff & Resources: For all projects, the EISO will collaborate and consult with multidisciplinary IMMPaCt and Nutrition Branch staff, including epidemiologists, physicians, health scientists, biostatisticians, laboratorians, and behavioral scientists. We have a strong history of collaboration with staff across our Branch, Division, CDC, and outside partners to have appropriate expertise or support on projects. Training is available as needed.

Special Skills Useful for this Position: Skills in designing, implementing, and analyzing complex surveys; experience with biological data collection; intervention monitoring and evaluation experience; nutrition/micronutrient content; French, Spanish, or potentially other languages; quantitative data management and analysis"”all these skills would be great but are not required. We have a strong history of successful EISOs with backgrounds ranging from nutrition, epidemiology, pediatrics, internal medicine, maternal and child health, behavioral scientists, anthropology, etc. Our objective is to capitalize on the strengths the EISO brings and build strengths in other areas.

Domestic Travel: 0% **International Travel:** 15%

NCCDPHP-DNPAO-OPCB-Georgia-2019-01

Primary Supervisor: Sohyun Park, Team Lead, EIS 2007

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Secondary Supervisor(s):

- Elizabeth Lundeen, Epidemiologist, EIS 2015
- Alyson Goodman, Medical Officer, EIS 2010

Background: Poor diet and physical inactivity are prevalent risk factors in the U.S. that contribute to obesity, chronic disease, and early death. The Obesity Prevention and Control Branch (OPCB) monitors the prevalence of obesity and conducts epidemiologic research on obesity determinants and health consequences. OPCB develops and promotes evidence-based obesity prevention strategies and translates evidence into guidelines/recommendations. We partner with communities, states, universities, and national groups to remove barriers people face in accessing nutritious, affordable foods, and to implement policy and environmental supports for healthy behaviors in schools, childcare centers, worksites, hospitals, and retail stores. We focus on improving health equity in communities that are disproportionately affected by obesity and chronic disease. (https://www.cdc.gov/obesity/)

OPCB activities include:

(1) Publishing statistics on prevalence of obesity and dietary risk factors, including annual state obesity maps (https://www.cdc.gov/obesity/data/prevalence-maps.html)

(2) Conducting epidemiologic research of behavioral risk factors, systems/environmental supports, and healthcare-based prevention & treatment related to diet, physical activity, and obesity

(3) Examining health disparities and identifying groups/communities that are disproportionately affected by obesity and poor diet

(4) Improving body mass index metrics for characterizing weight change in children with severe obesity

(5) Informatics capacity-building to utilize electronic health record data for population health surveillance and research

Current Work: (1) Association of adolescent sugar-sweetened beverage (SSB) intake with parent intake/attitudes

(2) Clinician characteristics associated with pediatric obesity screening and weight management referral

(3) SSB intake by rural/metropolitan residence

(4) Assessment of healthcare system-based food insecurity programs

(5) Nutrition environment Epi-Aids in Guam, American Samoa, Navajo Nation, National parks

Proposed Initial Projects: (1) Changes in perceptions of drinking water safety and its associations with plain water and sugar-sweetened beverage intake among US adults after the Flint Crisis using 2018 SummerStyles survey data

(2) Healthcare providers' counseling practices on nutrition and physical activity during well-child visits using 2018 DocStyles data

(3) Compare EHR-derived child BMI data to local/regional/national survey data to determine the utility of EHR data for child obesity surveillance

Proposed Analytic Project:

Examining behaviors, environments, and practices and their associations with key characteristics on topics such as:

(1) Changes in perceptions of drinking water safety and its associations with plain water and sugar-sweetened beverage intake among US adults after the Flint crisis using 2018 SummerStyles survey data

(2) Healthcare providers' counseling practices on nutrition and physical activity during well-child visits using 2018 DocStyles survey data

(3) Childhood obesity prevalence by insurance payer types using National Health Interview Survey data
(4) Prevalence of obesity and related co-morbidities among large cohorts of children using electronic health record data
(5) Examine body mass index and frequency of child obesity best practices (e.g., screening, motivational interviewing) in a national sample of pediatric primary care records
(6) Worksite food and nutrition environments

Other projects of interest to the incoming EISO will also be considered.

EISO will conduct data analyses utilizing existing protocols and statistical coding templates that can be adapted including multivariable regression modeling with confounder and effect modification assessment. In addition, the EISO will be supported in translating the research findings into dissemination products for multiple users including the media, professional organizations, researchers, and practitioners.

Proposed Field Investigation Project:

The incoming EISO will have opportunities to lead an investigation that involves primary data collection. The specific topic for the investigation will be determined by the interest of incoming EISO and requests from state and territory partners. OPCB has outstanding records of leading field investigations. From 2011--2018, EISOs in OPCB have led 6 Epi-Aids (2 in American Samoa; Denver, CO; Guam; Navajo Nation; and National parks). For example, the current EISO (Omoye Imoisili) has led two Epi-Aids:
(1) Using electronic health records to perform a rapid assessment of biometric and metabolic outcomes of low-income children with obesity enrolled in a childhood weight management program in Denver, CO to aid program knowledge of efficacy
(2) Rapid assessment and validation of the non-communicable diseases Hybrid Survey, American Samoa.
Our previous EISOs led Epi-Aids to assess the nutrition environment in stores and restaurants in American Samoa, Guam, Navajo Nation, and National parks. In addition, our EISOs have taken part in infectious disease outbreak investigations and numerous emergency response deployments to aid the agency mission.

Additionally, the Obesity Prevention and Control Branch (OPCB) supports EISOs participating in Epi-Aids and emergency response deployments.
The incoming EISO will have opportunities for collaboration with local or state health departments, NGOs, and universities. DNPAO funds partners to advance the nation's chronic disease prevention efforts. Working with staff and Project Officers in DNPAO, the incoming EISO will have an opportunity to visit funded site(s) and provide technical assistance. Currently, there are 6 funded program opportunities for evaluation or research:
(1) State Physical Activity and Nutrition Program (SPAN)
(2) High Obesity Program (HOP)
(3) Racial and Ethnic Approaches to Community Health (REACH)
(4) Childhood Obesity Research Demonstrations (CORD)
(5) Childhood Obesity Data Initiative (CODI)
(6) Nutrition and Obesity Policy Research and Evaluation Network (NOPREN)

As an example, for SPAN, DNPAO funds 16 state recipients to implement evidence-based strategies at state and local levels to improve nutrition and physical activity. Our current EISO spent about 4 weeks at the GA health department in 2018. For REACH 2018, DNPAO funds 31 communities to reduce health disparities among racial/ethnic populations with the highest burden of chronic disease (e.g., heart disease, Type 2 diabetes) through tailored interventions to address risk behaviors (e.g., tobacco use, poor nutrition, and inactivity). NOPREN is comprised of over 250 researchers that collaborate on projects related to rural food access, food insecurity, child care, drinking water, and healthy retail. The EISO can collaborate on a NOPREN project based on interest area. In addition, the EISO can serve on a multi-agency committee as part of the National Collaborative on Childhood Obesity Research (NCCOR), which includes CDC, USDA, and NIH.

Proposed Surveillance Project:

(1) Compare EHR-derived child BMI data to local/regional/national survey data to determine the utility of EHR data for child obesity surveillance. DNPAO has an existing relationship with PEDSnet, IQVIA, and athenahealth, institutions that integrate and standardize clinical data for use in surveillance and population health research. PEDSnet, IQVIA, and athenahealth will have clinical, informatics, and research staff that are available to the EISO during the evaluation process.
(2) Similar to #1, assess EHR-derived BMI data for adults from IQVIA, athentahealth
(3) Compare state-level fruit/vegetable and sugar-sweetened beverage intake among adults between two data sources (i.e., National Health Interview Survey, Behavioral Risk Factor Surveillance System)

The project will involve a combination of a secondary (desk-based) evaluation of a surveillance system, as well as interacting with stakeholders of the surveillance system (e.g. coordinating with state-based clinical partners in Federally Qualified Health Center systems who both collect electronic health record (EHR) data and utilize the results of EHR-derived surveillance data to improve clinical care for their patients).
Current Position Data:
BRFSS, NHANES, NHIS, Styles surveys, YRBS, the Population Health's National Worksite Survey, FLASHE study, FoodAPS, National Ambulatory Medical Care Survey, MarketScan, WIC PC, EHR data, and others. Opportunities exist for collaborative projects with internal/external partners. Data are accessible and readily available within the first month of the officer's assignment.
Position Strengths: OPCB offers exciting EIS experiences, where an EISO can lead projects from start to finish. The EISO will work in a strong team environment. OPCB values work-life balance and has a long-standing commitment to mentoring EISOs. From 2011--2018, EISOs in OPCB have led 6 Epi-Aids (2 in American Samoa; Denver, CO; Guam; Navajo Nation; and National parks), and participated in CDC Epi-Aids (Zika, Ebola, Hepatitis C). All OPCB EISOs completed their CALs within the 1st year. EISOs gain strong analytic skills on complex survey data, longitudinal cohort data, and "big data" (electronic health records/claims) and publish multiple 1st authored manuscripts.
Staff & Resources: OPCB is comprised of numerous doctoral level epidemiologists, physicians, EIS Alumni, nurses and prevention experts, and other fellows (Prevention Effectiveness, ORISE, Informatics) who are all friendly and fun to work with. OPCB staff have experience in state, federal, and international public health settings. EISO will work closely with OPCB staff and colleagues throughout DNPAO as well as sister-divisions. Experienced EISO supervisors and mentors have multiple years supervising EISOs and provide epidemiologic and statistical training to assist with projects and CALs. OPCB offers diversity of experience and scientific strengths of staff.
Special Skills Useful for this Position: EISOs from all backgrounds including physicians, doctoral scientists, and nurses have made major public health impacts with OPCB. EISOs who are flexible, eager to learn, willing to work hard, and able to work in teams will get the most out of an EIS assignment in OPCB. Other useful skills include interest in chronic disease epidemiology, food and/or health systems, and health equity; and the ability to be diplomatic, to work on multiple project simultaneously, to work both independently and as part of a team, and excellent communication skills.
Domestic Travel: 10% **International Travel:** 0%

NCCDPHP-DNPAO-PAHB-Georgia-2019-01

Primary Supervisor: John Omura, Medical Officer, EIS 2014

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Secondary Supervisor(s):

- Susan Carlson, Team Lead
- Emily Ussery, Epidemiologist, EIS 2015

Background: The Physical Activity and Health Branch's (PAHB) vision is to have active people in an activity-friendly nation. To achieve this, we focus on creating communities that make it safe and easy for everyone to live an active lifestyle. The Branch's Physical Activity Epidemiology and Surveillance Team (PEST!) is responsible for monitoring physical activity levels in the US, performing epidemiologic research into the determinants and health effects of physical activity, developing and evaluating evidence-based interventions, exploring alternative big data, and providing technical assistance to multi-sector partners.

Some specific PEST activities include:
(1) assessing policy, systems, and environmental strategies to improve physical activity and walking in multiple contexts (e.g., active transportation);
(2) developing built environment measurement methods and tools;
(3) examining and addressing disparities related to physical activity and access to pedestrian infrastructure;
(4) studying effects of physical activity, walking, sedentary behavior, and inactivity on population health; and
(5) evaluating data systems that conduct behavioral, environmental, and policy-related surveillance.

The Branch coordinates and provides scientific support to major Federal guidelines and recommendations, including the 2018 Physical Activity Guidelines for Americans, 2nd edition and Step it Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities.
Current Work: - Led Epi-Aid assessing walkability in the US Virgin Islands
- Estimated trends in walking among adults
- Examined utility of wearable activity monitors for physical activity surveillance
- Examined disparities in meeting physical activity guidelines i
Proposed Initial Projects: Our EIS officer will be ready to hit the ground running, with data and support immediately available for most of the projects mentioned above, including:
- Assessing the utility of the American Housing Survey for surveillance of community supports for active living
- Evaluating sedentary behavior surveillance in the US
- Tracking adoption of policy supports for physical activity (e.g., Complete Streets) using GIS data
- Assessing trends and demographic disparities in physical activity in the US
- Examining changes in the prevalence of community supports for walking and physical activity at the state and national levels

Proposed Analytic Project:
PAHB projects range from descriptive to complex epidemiologic studies. We take a step-wise approach with new officers, helping them progress in their analytic skills depending on their incoming comfort level.

Descriptive projects include:
- tracking adoption of policy supports for physical activity (e.g., Complete Streets); and
- assessing trends and demographic disparities in physical activity and walking in the US.

More advanced analyses include:
- assessing the association between community-level supports and physical activity;
- conducting geospatial analyses using Geographic Information System (GIS) data; and
- examining long-term changes in the prevalence of community supports for walking and physical activity at the state and national levels.

Our EIS officer will develop expertise in analyzing large, complex datasets. There will also be opportunities to work with big data, including analyzing data from wearable devices that track movement and location (e.g., Strava) and developing methods for monitoring built environment features through automated environmental audits of street view photos.

Proposed Field Investigation Project:

We are extremely supportive of our EIS officers leading their own primary data collection project or deploying as part of an Epi-Aid or agency response. Potential opportunities for field investigations include: 1) conducting an on-the-ground walkability assessment with one of our Division's grantees; 2) evaluating demonstration projects to improve pedestrian infrastructure in communities; and 3) developing and testing methods for measuring walkability and community supports for walking in communities. Past field experiences for EIS officers in our branch have included leading an Epi-Aid to evaluate walkability in the US Virgin Islands; deploying to Sierra Leone for the Ebola outbreak; responding to the H1N1 outbreak in Texas and on a naval vessel; investigating water-related injuries on Lake Mead; and supporting the Ebola and Zika responses in CDC's Emergency Operations Center.

The Division of Nutrition, Physical Activity, and Obesity (DNPAO) is currently supporting 62 grant recipients across the country (including states, cities, tribal organizations, and community organizations) to improve physical activity by creating activity-friendly communities. Over the next 5 years, grantees will collaborate with CDC and external partners to connect sidewalks, paths, bicycle routes, and public transit with homes, schools, worksites, parks, or recreation centers through implementing master plans and land use interventions. EIS officers will have opportunities to collaborate with these grantees and other public health partners, including potential site visits, providing epidemiologic technical assistance, and facilitating training for interdisciplinary community teams. More generally, PAHB collaborates with national partners from a wide variety of sectors including the Department of Transportation, Environmental Protection Agency, National Institutes of Health, American College of Sports Medicine, American Heart Association, Smart Growth America, and many more.

Finally, our EIS officers often develop subject matter expertise by attending the Physical Activity and Public Health Postgraduate Course on Research Directions and Strategies. This 8-day course trains public health researchers and practitioners with expertise in population-level physical activity research and promotion. Topics include measurement of physical activity (e.g. questionnaires, accelerometers), epidemiologic study design, best practice intervention strategies, policy and environmental supports for physical activity, and current research on physical activity promotion. Attendees have one-on-one and small group interaction with leading experts in the field. This course is a phenomenal opportunity to learn from renowned leaders and researchers, and also network with young investigators from around the world.

Proposed Surveillance Project:

PAHB's main strategic priority is to improve and promote activity-friendly communities. As a result, surveillance of community supports for active living is essential for us in monitoring progress and determining success. Our Branch regularly works with data from a range of surveillance systems, including established large national surveys (e.g., NHANES, BRFSS, NHIS) to emerging potential data sources (e.g. American Housing Survey, wearable activity monitors, policy databases).

Possible surveillance evaluation projects for an EIS officer include:

- Evaluating the Division's National Survey of Community-Based Policy and Environmental Supports for Healthy Eating and Active Living.
- Assessing the utility of the Census Bureau's American Housing Survey for surveillance of community supports for active living.
- The 2018 release of the Physical Activity Guidelines for Americans, 2nd edition created a number of new challenges and opportunities for physical activity surveillance. For example, new guidelines regarding avoiding sedentary behavior will require an evaluation of sedentary behavior surveillance methods in the US (e.g. NHANES).
- Examining the feasibility of using a policy database (e.g., National Complete Streets Coalition Policy Database) for surveillance purposes.

Our EIS officer will have the opportunity to meet with key informants and stakeholders of the selected survey to collect pertinent data for their evaluation, which will help develop and strengthen partnerships. The findings

from the surveillance evaluation project will be instrumental in informing the Branch's 10-year surveillance plan and monitoring progress in national physical activity promotion efforts.

Current Position Data:

The data systems we typically use are large, nationally representative surveys with data readily available for analysis. These datasets include the National Health Interview Survey, the Behavioral Risk Factor Surveillance System, National Health and Nutrition Examination Survey, the National Household Travel Survey, and the Youth Risk Behavior Surveillance System. In addition, our Division implements the Community-Based Policy and Environmental Supports for Healthy Eating and Active Living, which is a national survey of US municipalities regarding policy supports for health behaviors. We also have access to data from key external partners, such as the National Complete Streets Coalition.

Position Strengths: PAHB/PEST prides itself on providing EIS officers a supportive, fun, and cohesive team learning environment. Over the past 15 years, PAHB has successfully supervised 11 officers. For this current position, two of our supervisors are EIS alumni and the third has extensive experience supervising EIS officers. As a PEST member, you will help set the national physical activity agenda, including the implementation and promotion of the Physical Activity Guidelines for Americans, 2nd edition released in 2018. You will also have a wide range of opportunities to develop epidemiologic expertise, including scientific analyses, technical support, communications, and field work.

Staff & Resources: PAHB is well positioned to support an incoming EIS officer. Collectively, we represent the largest group of physical activity experts within the Federal government. Several of our staff are EIS alumni and are always happy to provide mentorship. Our EIS officer will have ready access to experts in statistics, GIS, and epidemiology on the PEST team. In addition, PAHB has experts in a wide range of topics and skills, including health economics, public health policy, communications, health equity, program planning, evaluation, translation, and more.

Special Skills Useful for this Position: Experience with data analysis and a background in physical activity/exercise or related fields are beneficial. However, we are thrilled to work with EIS officers with any baseline experience and skill level in these areas. As supervisors, we take a stepwise and conscientious approach to technical training and professional development, and work with our officers to meet their needs depending on their incoming comfort level.

Domestic Travel: 10% **International Travel:** 0%

NCCDPHP-DRH-MIHB-Georgia-2019-01

Primary Supervisor: CDR Sharyn Parks-Brown, Epidemiologist, Infant Health Team, Maternal and Infant Health Branch, EIS 2008

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Secondary Supervisor(s):

- Dave Goodman, Team Lead, Maternal Health Team, Maternal and Infant Health Branch/Epidemiologist
- Ada Dieke, Health Scientist, Pregnancy Risk Assessment Monitoring System Team, Women's Health and Fertility Branch, EIS 2015

Background: CDC's Division of Reproductive Health (DRH), National Center for Chronic Disease Prevention and Health Promotion, is the focal point for issues related to reproductive, maternal, and infant health. For over 50 years, we have been dedicated to improving the lives of women, children, and families through research, public health surveillance and monitoring, technical assistance, and partnerships. DRH's Strategic Areas of Focus include Infant Mortality and Morbidity, and Maternal Mortality and Complications of Pregnancy with cross-cutting focus on translating science to practice and policy. DRH also provides rapid response to emerging issues affecting maternal and child health, including the current opioid crisis.

DRH's Maternal and Infant Health Branch (MIHB) provides scientific leadership in the promotion of women's health and infant health around pregnancy and works to reduce disease and death among mothers and babies, with special attention to reducing racial/ethnic inequities. Key activities include pregnancy-related mortality and sudden unexpected infant deaths (SUID) surveillance to produce data for action. MIHB provides support to local Maternal Mortality Review Committees and state perinatal quality collaboratives (PQCs). This position collaborates with DRH's Women's Health and Fertility Branch (WHFB), which includes the Pregnancy Risk Assessment Monitoring System (PRAMS) team that maintains surveillance on maternal experiences nationwide.

Current Work: Recent: Racial/ethnic disparities in assisted reproductive technology use; development of national clinical guidance during Ebola and Zika response. Current: Pregnancy Mortality Surveillance System evaluation, assessment of maternal-geographic characteristics and home births (Pregnancy Risk Assessment Monitoring System), neonatal abstinence syndrome validation in Massachusetts, developing pregnancy/neonatal definitions for syndromic surveillance in BioSense.
Proposed Initial Projects: DRH houses a number of large surveillance systems that would allow immediate start of analytical and surveillance projects. Initial projects will include analytical or surveillance components such as:
1) Description of pregnancy-related mortality by urbanicity, Pregnancy Mortality Surveillance System (PMSS);
2) Description of infectious and cardiovascular causes of pregnancy-related death, PMSS;
3) Evaluate the social determinants of health among cases of sudden unexpected infant death (SUID), SUID Case Registry;
4) Evaluate the PMSS or PRAMS surveillance systems for assessment of substance use and mental health conditions.

Proposed Analytic Project:
Projects might include:
1) Pregnancy-related mortality by urbanicity, Pregnancy Mortality Surveillance System (PMSS)
PMSS is a national pregnancy-related mortality surveillance that collects data about all women who died during pregnancy or within 1 year of pregnancy from 52 reporting areas. This analysis will identify geographic disparities in pregnancy-related mortality.
2) Infectious, cardiovascular causes of pregnancy-related death, PMSS
This analysis will describe leading causes of pregnancy-related mortality to inform prevention activities.
3) Social determinants of health among cases of sudden unexpected infant death (SUID), SUID Case Registry
The SUID Case Registry collects information about SUID cases in 16 states and 2 jurisdictions, covering about 30% of all SUID cases in the United States. This analysis will help improve our understanding of the complex contextual factors around SUID deaths to improve our approaches to reducing SUID risk.
4) Experience of Discrimination and Mental Health, Pregnancy Risk Assessment Monitoring System (PRAMS)
PRAMS collects state-specific, population-based data on perinatal experiences, covering about 83% of all U.S. births. This analysis will help describe the prevalence of mental health care among women with a recent live birth who report an experience of discrimination.

Approved protocols are in place for all projects. Proposed projects will allow officers to learn/advance a variety of analytic skills (e.g., how to handle missing data, model building for multivariable regression, examining effect modification), and may include more sophisticated analytic approaches such as mediation analysis and propensity scores, depending on the officer's skills and interests.

Proposed Field Investigation Project:
Opportunities to fulfill the field investigation CAL include:

1) Working with a jurisdiction-based maternal mortality review committee to evaluate their processes using a newly developed set of logic-model based process and outcome measures;
2) Working with a DRH-funded state-based Perinatal Quality Collaborative to conduct an evaluation of the impact of PQCs in an area of interest to selected PQC, including analysis of the PQC locally-held data and/or some on-site data collection; or
3) Working as part of the CDC Opioid Response Coordinating Unit (ORCU) activities. DRH is implementing a project for the Rapid Assessment of Maternal Opioid Use and Overdose which includes a 2-year Learning Community designed to support states in implementing policies and programs targeting the identification and treatment of pregnant and postpartum women with substance use disorders. As part of that effort, primary data as requested by local jurisdiction will be collected to inform local capacity-building and surveillance efforts to address gaps in public health, health services and clinical care.

Previously, DRH provided primary support on an Epi-Aid to assess substance abuse among pregnant women in collaboration with the Great Plains Tribal Epidemiology Center. Current DRH EIS officer, Sonal Goyal, recently led an Epi-Aid to validate ICD-10 CM codes in Massachusetts. Previous EISOs have participated in both Ebola and Zika responses. The Division fully supports officer participation in domestic and international Epi-Aids and emergency response.

MIHB staff work closely with a variety of external partners and stakeholders, including state or local health departments, program planners, policy makers, professional organizations such as March of Dimes, American Academy of Pediatrics, American College of Obstetricians and Gynecologists, and the Association of State and Territorial Health Officials. These collaborations range from requesting input, learning unique aspects of system operations across sectors, to developing recommendations to improve data quality or system performance. They might engage with stakeholders during completion of surveillance projects by attending site visits to gain exposure to surveillance operations e.g. site visit to evaluate a maternal mortality review committee process. MIHB works with state PQCs which are networks of multidisciplinary teams that work to improve measurable outcomes for maternal and infant health by advancing evidence-informed clinical practices using quality improvement (QI) principles. The EISO can be involved with responding to field requests for technical assistance for SUID/SDY Case Registry, Maternal Mortality Review Committees, or PQC grantee projects. The officer can also collaborate with PRAMS state partners that help translate findings influencing public health policies and programs. EISO involvement with PRAMS sites may include collaborating on rapid assessments and site visits and strategies to improve survey response rates.

Officers also engage with stakeholders when they represent DRH at scientific meetings, respond to public inquiries, and collaborate with internal and external researchers to conduct analyses of reproductive health. Other opportunities for stakeholder engagement include abstract and manuscript development and writing, presentations at conferences and attendance at partner meetings.

Proposed Surveillance Project:
Depending on the officer's interest, several surveillance evaluation projects are possible. Examples include applying CDC's Framework for Evaluation of Public Health Surveillance Systems to the SUID & Sudden Death in the Young (SDY) Case Registry, evaluating PMSS ascertainment of pregnancy-associated suicides, homicides, and overdoses or evaluate the measurement of a specific indicator in PRAMS related to maternal/infant morbidity or mortality. The officer might also choose to evaluate the maternal mortality review committee process and/or the Maternal Mortality Review Information Application (MMRIA).

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Officers are encouraged to engage with system stakeholders (e.g., state health departments, program planners, policy makers, professional organizations) to obtain input, learn unique aspects of system operations, and develop valuable recommendations to improve system performance. Additional components of the evaluation

will be assessing timeliness of data collection, analysis, and dissemination. This activity will be tailored based on the officer's interest and ties directly into proposed analytic projects whereby more than one CAL can be completed with this activity.

Current Position Data:
DRH collaborates with national and state-based surveillance systems. Data available include: PRAMS 1988-2017, PMSS 1987--2015, SUID and SDY Case Registry 2010-2016, BRFSS, YRBSS. Other data immediately available include administrative datasets (e.g., HCUP, MarketScan), Maternal Mortality Review Committee (MMRC) data from states with a data sharing agreement and PQC programmatic monitoring data. All data sources are available immediately or within the first month of assignment.
Position Strengths: The position can be tailored to meet the officer's interests and goals. Strong epidemiologists and biostatisticians in the Division will work with the EISO to develop and strengthen epidemiologic and analytical skills. In addition, several team members and consultants are clinically active and hold clinical appointments at local medical institutions. The supervisors and teams have a long history of supporting EIS officers. These EISOs have completed their CALS and were successful in securing positions at CDC after EIS. The officer is encouraged to explore current and new areas of interest.
Staff & Resources: The supervisors, as well as other DRH team members and consultants, are fully committed to supporting the growth and development of the officer. Resources include access to experts trained in medicine (OB/GYN and neonatology and pediatrics), surveillance, epidemiology (including field assignees), maternal and infant health and statistics. Statisticians are also available for programming support and consultation. Other expertise for which the officer in this position will have access to include implementation science, policy analysis, economic and health services research.
Special Skills Useful for this Position: Interest in a variety of topics related to women's health, reproductive health, health disparities and inequities, access to care, maternal and infant outcomes. Familiarity with public health surveillance, epidemiological principles, analytic and writing skills are useful but not required.
Domestic Travel: 10% **International Travel:** 0%

NCCDPHP-DRH-WHFB-Georgia-2019-01

Primary Supervisor: Lauren Zapata, Epidemiologist/Behavioral scientist, Fertility Epidemiology Studies Team, Women's Health and Fertility Branch; CDR, United States Public Health Service, EIS 2005

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Secondary Supervisor(s):

- Denise D'Angelo, Senior Scientist/Epidemiologist, Pregnancy Risk Assessment Monitoring Team, Women's Health and Fertility Branch
- Dmitry Kissin, Team Lead, Assisted Reproductive Technology Team, Maternal and Infant Health Branch, EIS 2003

Background: For over 50 years, CDC's Division of Reproductive Health (DRH) has been dedicated to improving the lives of women, children, and families through research, public health surveillance, technical assistance, and partnerships. Key areas of DRH's work include reducing unintended pregnancies, surveillance of maternal behaviors and experiences around the time of pregnancy, and understanding the relationships between infertility and maternal morbidity and infant health. The EIS officer in this position will work with the Fertility Epidemiology Studies (FES) Team and the Pregnancy Risk Assessment Monitoring System (PRAMS) Team of the Women's Health and Fertility Branch (WHFB), and the Assisted Reproductive Technology Surveillance and Research Team (ART) of the Maternal and Infant Health Branch (MIHB). The FES Team improves access to and use of quality family services through research, surveillance, and partnerships to advance evidence-based guidelines and practices. The PRAMS Team implements a state-based surveillance system that collects

population-based data on maternal behaviors and experiences before, during, and shortly after pregnancy in 51 states/sites, representing ~83% of US births. The ART Team maintains the National ART Surveillance System (NASS), which collects information on nearly all ART cycles performed in U.S. fertility clinics to monitor the safety and efficacy of ART procedures.

Current Work: Identify factors associated with postpartum contraceptive use; examine implementation processes for World Health Organization family planning guidance; assess racial/ethnic disparities in assisted reproductive technology use; investigate trends in gestational surrogacy; participate in CDC Ebola and Zika emergency response activities and Epi-Aids; implementation of surveillance systems; and development of clinical guidance.

Proposed Initial Projects: Officers can expect to start any of the following projects within the first month of the assignment:

- Examine postpartum contraceptive use (or other reproductive health indicator) among women with a recent live birth using PRAMS data.
- Assess the adequacy of PRAMS to measure postpartum contraceptive use (or other reproductive health indicator) and identify opportunities for improvement.
- Assess adolescent sexual risk behaviors among in-school youth using YRBSS data.
- Examine contraceptive continuation rates and satisfaction among women served by the Z-CAN program participating in follow-up surveys.

Proposed Analytic Project:

Projects might include:

1) Examine postpartum contraceptive use among women with a recent live birth. Analysis of PRAMS data will help to understand characteristics associated with postpartum contraception use; findings may be used to improve service delivery.
2) Assess adolescent sexual risk behaviors among in-school youth. Analysis of data from the Youth Risk Behavior Surveillance System (YRBSS) will help to identify co-occurring risk behaviors among in-school youth and identify areas for intervention.
3) Evaluate outcomes of the Zika Contraception Access Network (Z-CAN). Z-CAN was a contraception access program launched in Puerto Rico during the 2016-2017 Zika virus outbreak. Analysis of monitoring and evaluation data from Z-CAN patients will contribute to understanding the program's impact on contraceptive continuation and satisfaction.
4) Compare maternal and infant complications for ART and non-ART births. Analysis of NASS data linked to data from the National Vital Statistics System (NVSS) will help to better understand and improve maternal and infant health outcomes of ART and non-ART fertility treatments.

Approved protocols are in place for all projects. Proposed projects will allow officers to learn/advance a variety of analytic skills (e.g., how to handle missing data, model building for multivariable regression, examining effect modification), and may include additional analytic approaches such as propensity scoring, depending on the officer's skills and interests.

Proposed Field Investigation Project:

Opportunities to fulfill the field investigation CAL include:

- Working with a PRAMS site to evaluate their processes for improving response rates and reaching hard to contact women and other potential opportunities.
- As part of CDC's Opioid Response Coordinating Unit (ORCU), DRH is implementing a 2-year "Learning Community" designed to support states in implementing policies and programs targeting the identification and treatment of pregnant and postpartum women with substance use disorders. As part of this effort, primary

data, as requested by local jurisdictions, will be collected to inform local capacity building and surveillance efforts to address gaps in public health, health services and clinical care.

- Working with a jurisdiction-based maternal mortality review committee to evaluate their processes using a newly developed set of logic-model based process and outcome measures.

Previously, DRH provided primary support on an Epi-Aid to assess substance abuse among pregnant women in collaboration with the Great Plains Tribal Epidemiology Center. Current EIS officer, Sonal Goyal, recently led an Epi-Aid to validate ICD 10 CM codes in Massachusetts. Previous EISOs have participated in both Ebola and Zika responses. The Division fully supports officer participation in domestic and international Epi-Aids and emergency response.

During the surveillance evaluation project, the officer is encouraged to engage with system stakeholders (e.g., state health departments, program planners, policy makers, professional organizations) to obtain input, learn unique aspects of system operations, and develop valuable recommendations to improve system performance. Officers will also have the opportunity to collaborate with public health partners during field investigation activities. For example, an officer might work with a PRAMS site to evaluate system operations, efforts to improve response rates among hard to contact women, or validate measurement of a specific indicator. The officer would work closely with the state, territorial, or tribal health department overseeing PRAMS in that site, as well as with other partners invested in the field investigation (e.g., local health departments, subject matter experts). Other partners an officer might engage with during the assignment include the American Academy of Pediatrics, the American College of Obstetricians and Gynecologists, the Health Resources and Services Administration (HRSA), the National Association of Community Health Centers, the National Healthy Start Association, the Office of Population Affairs, and/or the World Health Organization.

Proposed Surveillance Project:

Depending on the officer's interest, several surveillance evaluation projects are possible. Examples include evaluating adaptation of core PRAMS operations for rapid implementation of modules for emerging issues (e.g., Zika virus, opioid use, disabilities) or measurement of a specific indicator in PRAMS (e.g., postpartum contraceptive use, postpartum care visit attendance). The officer might also choose to evaluate CDC's Abortion Surveillance System. Evaluation of public health surveillance data for ART includes the recently upgraded NASS data collection system or the evaluation of NASS-NVSS linked cohort data.

Officers are encouraged to engage with system stakeholders (e.g., state health departments, program planners, policy makers, professional organizations) to obtain input, learn unique aspects of system operations, and develop valuable recommendations to improve system performance. Additional components of the evaluation will be assessing timeliness of data collection, analysis, and dissemination. This activity will be tailored based on the officer's interests. Officers can often integrate a selected analytic project with the surveillance evaluation.

Current Position Data:

DRH collaborates with national and state-based surveillance systems. Data readily available to the officer include: PRAMS data (1988--2017); NASS data (1996--2016); linked NASS-NVSS data (2014--2015); linked NASS and state vital record, birth defect registry, and hospital discharge data for 4 states (2000--2014); BRFSS and YRBSS data; data from U.S. family planning providers (3 waves of data collection); data from women served by the Z-CAN program. Other data immediately available include administrative datasets (e.g., HCUP, MarketScan). All data sources are available immediately or within the first month of assignment.

Position Strengths: The position can be tailored to meet the officer's interests and goals. Strong epidemiologists and biostatisticians in the Division will work with the EISO to develop and strengthen skills. In addition, several team members are clinically active and hold clinical appointments at local medical institutions. The supervisors and teams have a long history of supporting EISOs and EISOs have completed their CALS and were successful in securing positions at CDC after EIS. The officer is encouraged to explore current and new areas of interest.

Staff & Resources: The supervisors, as well as other DRH team members and consultants, are fully committed to supporting the growth and development of the officer. Resources include access to experts trained in medicine (OB/GYN and Reproductive Endocrinology), surveillance, epidemiology (including field assignees), family planning, adolescent health, emergency response, and statistics. Statisticians are also available for programming support and consultation. Other areas of expertise for which the officer in this position will have access to include implementation science, policy analysis, and economic and health services research.
Special Skills Useful for this Position: Interest in a variety of topics related to women's health, reproductive health, health disparities and inequities, access to care, maternal and infant outcomes. Familiarity with public health surveillance, epidemiological principles, analytic and writing skills.
Domestic Travel: 10% **International Travel:** 0%

National Center for Environmental Health/Agency for Toxic Substances and Disease Registry

The National Center for Environmental Health (NCEH) and Agency for Toxic Substances and Disease Registry (ATSDR) protect people's health from environmental hazards. Explore the exceptional opportunities at NCEH and ATSDR to help promote healthy homes and communities, prevent asthma and lead poisoning in children, improve capabilities for preparing for and responding to environmental disasters, respond to foodborne and waterborne outbreaks in local communities, and build state and national public health capacity. NCEH and ATSDR also offer opportunities to be part of a cruise ship inspection or outbreak investigation with the Vessel Sanitation Program, apply geospatial science methods to improve environmental health emergency management and planning, explore the impact of air quality on the health of millions of children and adults with asthma, and investigate health effects of emerging environmental threats. Do you want to be at the frontline of environmental public health? Find more at youtube.com: National Center for Environmental Health.

NCEH - ATSDR-DEHSP-ACHB-Georgia-2019-01

Primary Supervisor: Kanta Sircar, Team Lead, EIS 2007

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Secondary Supervisor(s):

- Maria Mirabelli, Epidemiologist

Background: Asthma is a chronic disease of the lungs affecting approximately 1 in 13 people in the United States. Each year, asthma causes over 1.7 million emergency department visits, 11 million physician office visits, and 3,000 deaths in the United States. The Asthma and Community Health Branch is committed to reducing the burden of asthma and helping individuals with asthma achieve better health and quality of life by conducting high-quality research and providing assistance to states and non-governmental organizations to improve asthma surveillance, train health professionals, educate individuals with asthma, and explain asthma to the public. The Branch implements the National Asthma Control Program and includes CDC's climate and health, hurricane, wildfire, and indoor air quality activities. Our Branch is organized into six teams, reflecting the focus of our work: asthma and air pollution epidemiology, climate science and health, communications, evaluation, program activities, and surveillance.

The Branch, including two former EIS officers and one current EIS officer, is dedicated to providing a well-rounded training experience. To ensure that the learning goals are met, EIS officers can choose projects from across all teams, engage with external partners, and collaborate with colleagues across CDC to address a variety of important environmental health challenges.

Current Work: -Deployed to CDC's Emergency Operations Center and Houston, Texas for 2017 hurricane response

- Analyzed large datasets to investigate high-impact communication of air quality alerts, health effects from prescribed burning, and emergency asthma-related healthcare use
- Evaluated national aeroallergen surveillance system
- Developed communication materials about outdoor air pollution

Proposed Initial Projects: The Asthma and Community Health Branch has several projects, including surveillance and analytic projects, that the EIS officer may begin immediately: (1) evaluation of the Environmental Protection Agency's Air Quality Index, a national air quality surveillance system; (2) analysis of undiagnosed asthma among children using National Health and Nutrition Examination Survey data; (3) assessment of the frequency and severity of asthma symptoms among children with and without active asthma using Behavioral Risk Factor Surveillance System Asthma Call-back Survey data; and (4) engagement in wildfire public health activities.

Proposed Analytic Project:
The EIS officer will be able to choose from several proposed analytic projects for which data are available and ready for analysis, including: (1) analysis of National Health and Nutrition Examination Survey data to estimate the prevalence of undiagnosed asthma among children in the United States and to compare the frequency and severity of asthma-related symptoms among children with diagnosed and undiagnosed asthma; and (2) analysis of Behavioral Risk Factor Surveillance System Asthma Call-back Survey data to describe the frequency and severity of asthma-related symptoms among U.S. children with and without active asthma.

The EIS officer may also develop original analytic projects using the Branch's available data or publicly available data about air quality, community health, and asthma. Such projects might include linking existing health data with air quality datasets or overlaying data about environmental events (e.g., drought, hurricanes, wildfires) to estimate the public health burden of the environmental exposure. Specific projects can be tailored to the officer's interests and expertise.
Proposed Field Investigation Project:
The Asthma and Community Health Branch enthusiastically supports the participation of EIS officers in Epi-Aids and emergency response deployments. An EIS officer with the Branch would be a first responder in a deployment to an emergency affecting air quality, such as a hurricane, wildfire, or volcano.

Recent officers have led Epi-Aids in Puerto Rico to assess undetermined risk factors for asthma-related healthcare use and have been deployed to hurricane-affected areas of Texas to conduct environmental sampling and investigate risk factors for invasive mold infections. Officers have also participated in Epi-Aids to the U.S. Virgin Islands to assess characteristics of the built environment and Illinois to investigate coagulopathy among emergency room patients reporting synthetic cannabinoid use.

The Branch maintains strong collaborations with the three other branches in the Division of Environmental Health Science and Practice, and officers have opportunities for field investigations with EIS officers and others across the Division. The Asthma and Community Health Branch also supports participation in Epi-Aids and emergency response deployments originating outside the National Center of Environmental Health. The environmental expertise of EIS officers from the National Center for Environmental Health has often been a valuable asset to Epi-Aids led by other centers.
EIS officers will have many opportunities to collaborate with public health partners. The Asthma and Community Health Branch provides technical assistance to 29 National Asthma Control Program grantees, 18 Climate-Ready States and Cities Initiative grantees, and 4 hurricane preparedness and response grantees. National Asthma Control Program grantees develop and implement programs to improve asthma treatment, management, and control in the United States. Climate-Ready States and Cities Initiative grantees prepare for and respond to the health effects of extreme weather events, decreased air quality, and illnesses transmitted by food, water, and climate-sensitive disease carriers. The Branch provides all grantees technical assistance, including data analysis, program evaluation, and health communications support.

The Branch also maintains strong collaborations with the Environmental Protection Agency; U.S. Department of Housing and Urban Development; National Heart, Lung and Blood Institute; U.S. Forest Service; Centers for Medicare and Medicaid Services; CDC's Millions Hearts© Initiative; and other federal partners. An example of a recent collaboration between an EIS officer in the Branch and a public health partner is an activity with CDC's Million Hearts© Initiative to draft communication materials about air pollution for patients with heart disease and their health care providers. The Branch's many non-governmental partners include the National Indian Health Board, American Lung Association, Association of State and Territorial Health Officials, and Council of State and Territorial Epidemiologists.

An incoming EIS officer will have the opportunity to choose activities among the many ongoing productive partnerships, and specific projects can be tailored to the officer's interests and expertise.

Proposed Surveillance Project:
Each day, information about local air quality is reported for cities across the United States via air quality alerts using the U.S. Environmental Protection Agency's Air Quality Index, a national air quality surveillance system. The Air Quality Index is a six-category index that translates hourly measurements of carbon monoxide, ground-level ozone, nitrogen dioxide, particle pollution, and sulfur dioxide into information to help people understand their daily air quality, its associated health risks, and actions they can take to protect their health. The EIS officer will evaluate implementation of the Air Quality Index. The evaluation will include interviews with key stakeholders and may include one or more site visits to local or regional air monitoring stations. Because the Air Quality Index is reported for cities across the United States, the geographic focus of the evaluation will be national. The surveillance evaluation will be designed to provide useful information about the collection, processing, and communication of daily measures of ambient air quality.
Current Position Data:
Readily available sources of data about adults and children with asthma include the National Environmental Public Health Tracking Network, Behavioral Risk Factor Surveillance System Asthma Call-Back Survey, National Health and Nutrition Examination Survey, National Health Interview Survey, IBM MarketScan© Research Databases, ConsumerStyles Survey, American Hospital Association Survey, Healthcare Cost and Utilization Project data, and others. Some datasets can be linked with geographically- and temporally-resolved air quality and weather data, including data about particle pollution, ozone, and meteorological conditions.
Position Strengths: This assignment offers the opportunity to address important public health problems, including air pollution, asthma, climate-related health (e.g., from extreme temperatures, drought), hurricane response, and wildfire smoke exposures. Emphasis will be on developing and adapting projects to the officer's areas of interests and background. The Branch supports improving analytic skills and provides opportunities to collaborate with other groups within and outside of the National Center for Environmental Health. Such opportunities include field investigations and assignments with the CDC Emergency Operations Center. The Branch has extensive experience supervising officers, and the officer will be part of a successful and collegial team.
Staff & Resources: The Asthma and Community Health Branch has epidemiologists, physicians, environmental health scientists, statisticians, economists, and communications and program evaluation experts who are committed to ensuring a well-rounded training experience. The Branch offers support in epidemiologic study design and data analysis and EIS officers are encouraged to take software-training coursework (e.g., SAS, Endnote) as needed to develop additional skills needed for a successful career in public health. The Branch also offers strong support across a range of technical areas, including health communications, exposure assessment, program evaluation, and health economics.
Special Skills Useful for this Position: The Asthma and Community Health Branch has successfully mentored EIS officers with a variety of academic and professional backgrounds. Key components to success include strong teamwork skills, excellent written and verbal communication, problem solving, self-management, and basic working knowledge of data management and analysis using SAS. Most importantly, the officer should be interested in learning more about the role of the environment on population health
Domestic Travel: 5% **International Travel:** 5%

NCEH - ATSDR-DEHSP-WFEHSB-Georgia-2019-01

Primary Supervisor: Amy Freeland, Vessel Sanitation Program Deputy Chief and Epidemiologist, EIS 2009

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Secondary Supervisor(s):

- LCDR Keisha Houston, Senior Epidemiologist, EIS 2011
- Adrianne Holmes, Deputy Branch Chief of Water, Food, and Environmental Health Services Branch

Background: The Vessel Sanitation Program (VSP) sits within CDCs National Center for Environmental Health/Division of Environmental Health Service and Practice/Water, Food, and Environmental Health Service Branch. VSP's congressional mandate is to assist the cruise industry in developing comprehensive public health programs to minimize the introduction, transmission and spread of acute gastroenteritis (AGE) illness into the United States. This collaborative approach between government and industry achieves its goals by:
*Developing mutually agreed-upon policies and procedures including operational and construction standards;
*Providing public health training to cruise industry personnel;
*Conducting outbreak investigations (when necessary);
*Making recommendations for improved public health practice.

The EISO's day-to-day work in VSP will include:
*Maintaining and monitoring the national cruise ship AGE surveillance system, formally known as the Maritime Illness Database and Reporting System (MIDRS)
*Conducting epidemiologic investigations and environmental health assessments on cruise ships in U.S. jurisdiction when there are AGE outbreaks, case count elevations, and case clusters;
*Conducting data analyses and writing scientific articles and reports on VSP's AGE surveillance data and ship inspection data;
*Providing subject matter expertise to the cruise industry, shipyards, and other government agencies responsible for maritime enteric disease prevention and control.
Current Work: *Jared Rispens, MD (2018), Amy Lavery, PhD (2017) have investigated multiple ship outbreaks using GIS to plot cases, public vomiting events, and spread of illness over time.
*Dr. Vikram Krishnasamy (2016), LCDR Jennifer Collins (2017) sailed with a ship to assist with a case-control study of a Clostridium perfringens outbreak.
Proposed Initial Projects: Within the first month, VSP's EISO can expect to begin the VSPIRS surveillance evaluation by
*meeting with VSP's IT analyst to learn about the various system components and how it works,
*shadowing cruise ship sanitation inspections and begin interviewing inspectors to get stakeholder feedback,
*making arrangements to meet with various cruise industry public health directors to get stakeholder feedback.
Also, the EISO will assist with AGE outbreak investigations as they occur. To prepare for outbreak investigations, the EISO will visit cruise ships to learn about the standards in place to prevent AGE outbreaks, and records available for review during investigations.
Proposed Analytic Project:
VSP has two main surveillance systems that they manage:
- MIDRS containing AGE illness reports from cruise ships sailing in US jurisdiction, and
- Vessel Sanitation Inspection Reporting System (VSPIRS) containing sanitation inspection results from all sanitation inspections conducted in the United States (violations and scores).

1) Using VSP's MIDRS the EISO will be able to conduct the following type of studies:
a) Emergency response AGE outbreak investigation of case clusters, case count elevations, and outbreaks on cruise ships in U.S. jurisdiction to determine:
i) Causative agent,
ii) Mode of transmission,
iii) Source of exposure,
iv) Public health recommendations to stop the current spread of illness and prevent future transmission;
b) Multivariable regression models to examine the impact of voyage length, passenger and crew demographics, ship size, ship age, itinerary, and causative agent on AGE outbreak (yes/no) and AGE rates (continuous) for FY2014"”2018;
2) Using VSP's VSPIRS data the EISO will be able to conduct the following types of studies:
a) Analytic studies to explore ship sanitation inspection results (score, violations) and their relationship to subsequent AGE illness rates and AGE outbreaks for FY2013"”2018.

b) The association between inspection violations and/or sanitation inspection scores with AGE illness and outbreaks on cruise ships.
c) Exploration of whether sanitation inspection violations are predictive of an impending AGE outbreak or AGE illness rates.

Proposed Field Investigation Project:

VSP's EISO will have multiple opportunities to collect primary data during cruise ship outbreak investigations, which often occur during the peak norovirus season of November to April each year. Depending on the AGE outbreak's suspected causative agent, mode of transmission, and source of exposure, the EISO and VSP may:
1) Conduct interviews with cruise ship passengers or crew members to explore their illness or non-illness experience;
2) Create and implement a unique questionnaire to determine voyage exposures (food, beverage, activity; on the ship and during port visits) typically given to both known cases and those believed to have not been ill with AGE;
3) Conduct various chart reviews depending on the EISO's areas of expertise, including but not limited to
a) medical charts,
b) potable water (production and bunkering)
c) recreational water facility water chemistry,
d) public vomiting/diarrhea log,
e) food safety cooling logs,
f) food provisioning records,
g) sanitation records, and
h) pest management logs.

The EISO will use these data to help determine the causative agent, mode of transmission, and source of exposure to help direct the sanitation and public health response, and craft public health recommendations to stop the outbreak and prevent future outbreaks.

VSP also strongly supports the EISO's involvement in Epi-Aid opportunities that will become available during the 2-year fellowship program.

VSP's EIOS will have multiple opportunities to interact with various public health and medical partners outside of CDC. For example, VSP's main partners are the cruise ship industry and most of our time is spent working directly with the public health and medical directors from the various cruise lines that have ships sailing in the United States. The EISO will work closely with cruise line medical and public health personnel during AGE outbreaks to monitor AGE reports and illness activity both during and immediately after outbreaks.

VSP's EIOS will also be working closely with our international public health partners such as VSP's equivalent in the Public Health Agency in Canada, the Caribbean Public Health Agency (CARPHA) Tourism and Health program, and EU ShipSan. During February 2019 VSP finalized plans to provide sanitation and AGE outbreak prevention and response training to several Caribbean island nations that are part of the CARPHA network, including Jamaica, Turks and Cacos, and the Bahamas. The trainings will take place in each country requesting VSP's subject matter expertise through training.

Proposed Surveillance Project:

VSP created the VSPIRS surveillance system in 2000 to capture cruise ship sanitation inspection results (i.e., violations, recommendations, and numerical scores) conducted by VSP's environmental health officers on cruise ships sailing in United States jurisdiction. VSP conducts unannounced sanitation inspections twice per year on ships sailing in its jurisdiction. The inspections are based on standards established in cooperation with the cruise industry and are based on the US FDA food code, the World Health Organization International Health Regulations, the U.S. Model Aquatic Health Code, and other resources based on scientific evidence of environmental strategies to control the introduction and spread of communicable diseases. Data captured by VSPIRS are input into the system by VSP inspectors, and the cruise industry are key consumers of these data.

VSPIRS has never been formally evaluated. VSP's EISO will formally evaluate the system, which will require cruise ship inspection visits, interviews with VSP inspectors and IT analyst, and meetings with cruise industry public health directors.

The EISO will provide results of the evaluation including recommendations for system improvement if necessary to VSP's staff at a staff meeting in VSP's Ft. Lauderdale, FL field office.
Current Position Data:
*Maritime Illness Data Reporting System: Cruise ship acute gastroenteritis syndromic surveillance system for ships in US jurisdiction
*Vessel Sanitation Program Inspection Reporting System: Cruise ship operational sanitation inspection violations and recommendations for inspections conducted by VSP environmental health specialists on ships in US jurisdiction
Position Strengths: VSP is fast-paced with opportunities for field and analytic work. The EISO will work directly with cruise industry personnel at the corporate level and onboard ships. The EISO can expect to travel primarily to U.S. ports with occasional international travel. VSP staff are a close knit group that enjoy working and traveling together to prevent and control maritime enteric diseases onboard vessels that visit U.S. Ports
Staff & Resources: VSP's EISO will work directly with VSP's Deputy Chief/Epidemiologist, supported by VSP's Senior Field Epidemiologist. Within our Branch and Division, we have access to subject matter experts in statistics, research design, public health communications, food safety, water safety, sanitation, vector control, and ventilation. VSP has a strong working relationship with ATSDR's GRASP (GIS) program, NCEZID's foodborne and waterborne disease subject matter experts and laboratory, and NCIRD's norovirus program and laboratory.
Special Skills Useful for this Position: Communication (written and oral) and interpersonal skills. Knowledge about acute gastroenteritis and data analysis skills are desirable but not required.
Domestic Travel: 40% **International Travel:** 5%

NCEH - ATSDR-OD-OEHEM-Georgia-2019-01

Primary Supervisor: Renee Funk, Associate Director for Emergency Management, EIS 2002

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Secondary Supervisor(s):

- Stephanie Foster, Epidemiologist / Unit Lead (Geospatial Epidemiology & Applied Research (GEAR) Unit, GRASP
- Andy Dent, Program Director, GRASP

Background: The EISO will be jointly assigned to the Geospatial Research Analysis and Services Program (GRASP) and the Office of Environmental Health Emergency Management (OEHEM).

The mission of GRASP is to provide leadership and expertise in the application of the concepts, methods, and tools of geography and geospatial information science to public health research and practice. Supporting this mission, GRASP collaborates with scientists at CDC/ATSDR and our public health partners to research and analyze geospatial trends and patterns associated with environmental health, infectious and chronic disease, injury, and emergency preparedness and response. GRASP engages with programs throughout CDC and across the broader public health community.

The mission of OEHEM is to manage, coordinate, and advance the NCEH/ATSDR response to environmental public health emergencies. In this role, OEHEM (1) coordinates important resources relevant to NCEH/ATSDR's responsible handling of complex emergency events, (2) advances awareness and training to increase

understanding of environmental health emergency management around the world, and (3) advocates for advanced integration of emergency planning across NCEH/ATSDR.

Thus, the EISO will be jointly assigned to programs involved in extensive and far-reaching collaborative efforts focused on geospatial science, technology, analysis, and visualization, as well as environmental health emergency management and planning.

Current Work: -Deployed for an investigation of synthetic cannabinoids in Illinois, a cruise ship outbreak, and post-hurricane assessments in Puerto Rico and U.S. Virgin Islands.

- Evaluated a cancer surveillance system
- Developed time/space tools to examine cruise ship outbreaks
- Examined linkages between Environmental Burden Index and NHANES biomarker data

Proposed Initial Projects: The EISO can begin work on the following projects within the first month of the assignment: (1) evaluation of the Global Disease Detection Surveillance System; (2) site-specific support to ATSDR's state-based GRASP partners; (3) analysis of PFAS-related health outcomes; and (4) analysis of the Atlanta Beltline Walkability Study.

Proposed Analytic Project:

The EISO may choose from the following analytic projects:

1. Time/Space Analysis of Enteric Disease Outbreaks

The EISO will analyze the progression of outbreaks on cruise ships. These outbreaks are monitored and reviewed by a GRASP partner, the NCEH Vessel Sanitation Program.

2. Regression Analysis of Per- and polyfluoroalkyl substances (PFAS)-related Health Outcomes

The EISO will examine the relationship between exposure to PFAS via drinking water and PFAS-related health outcomes.

3. Atlanta Beltline Walkability Study

The GRASP/Georgia State University Atlanta Beltline Study examines the impact of the Beltline on surrounding communities. The study has three components: (1) a walkability study assessing walkability of streets/sidewalks, (2) a use assessment evaluating residents' use of the Beltline, and (3) an environmental assessment to collect and analyze air quality data. The Study is underway, and the EISO will have the opportunity analyze the study data.

4. GRASP Environmental Justice Index Pilot

GRASP maintains the Social Vulnerability Index, an index enhancing understanding of social vulnerability of U.S. populations. GRASP is poised to release the Environmental Burden Index, an index facilitating understanding of environmental influences on health. The EISO will perform statistical analysis to combine the indices to form the Environmental Justice Index. The objective of the work of the EISO is to develop the EJI which will enable researchers to identify socially vulnerable communities that experience unhealthy conditions associated with environmental exposure and lack of access to healthy food, exercise opportunities, and health care. The EJI will be validated at a later date.

Proposed Field Investigation Project:

The EIS Officer will have the opportunity to participate in the following field-based primary data collection events, which will fulfill the field investigation CAL:

1. ATSDR/Center for Global Health (CGH) /GRASP Ukraine Chemical Exposure Investigation

GRASP is working with ATSDR and CGH scientists to examine exposures that have occurred at a plant in the Crimea. The EISO will have the opportunity to work with Ukrainian Field Epidemiology Training Program (FETP)

staff to deploy low-cost PM2.5 and SO2 monitors and survey the population to understand associated health outcomes.

2. NCEH Post-Emergency Community Assessments

GRASP provides expertise in GIS science/technology to the NCEH Community Assessment for Public Health Emergency Response (CASPER) team. The EISO will have the opportunity to deploy to the field to assist the CASPER team with a community assessment survey.

3. Global Polio Eradication Initiative (GPEI) Geospatial Support

GRASP has supported the GPEI since 2011. The EISO will have the opportunity to deploy to the field to provide GIS guidance to partners in polio-affected countries and to assist WHO and CDC staff in Geneva to enhance its polio case surveillance.

4. GRASP Emergency Response Drone Program

GRASP and the CDC Emergency Operations Center are developing a program supporting deployment of drones to photograph geographic areas affected by environmental health emergencies. The EISO will have the opportunity to deploy to sites to oversee data collection and drone use activities.

5. Epi-Aid Support

GRASP and OEHEM will support the EISO to deploy domestically and internationally in support of any Epi-Aid.

GRASP collaborates within and beyond CDC and the EISO will have the opportunity to engage with a wide range of public health partners, including the Global Polio Eradication Initiative and the World Health Organization; 20 state organizations supported by GRASP to better understand exposures and health at hazardous waste sites across the United States; the National Center for Health Statistics; the Center for Global Health; and others. GRASP is a collaborative program with 50% of its resources derived from partnerships beyond NCEH/ATSDR. The EISO will have the opportunity to engage with partners to address diverse challenges spanning environmental health, infectious and chronic disease, injury, and emergency preparedness and response.

Proposed Surveillance Project:

The EISO will have the opportunity to evaluate the following surveillance systems based on his/her preference:

1. Global Disease Detection (GDD) Surveillance System

GDD is a surveillance system designed and operated by the Center for Global Health. GDD collects case reports of disease gathered from government organizations in virtually all countries around the world. The EISO will be asked to focus on the (1) locational attributes and accuracy of each case, (2) opportunities for improving data based on enhanced data management methods, (3) opportunities for expanded collection and storage of case report metadata, and (4) identification of the usage of GDD data in CDC reports, analyses, and decision-making.

2. National Health and Nutrition Examination Survey (NHANES)

National Health and Nutrition Examination Survey (NHANES) has been collecting data since the 1960s, but GRASP has yet to formally assess the locational attributes contained within it. However, NHANES, as a rich resource of data, may provide opportunities for geospatial research. The EIS Officer will have the opportunity to evaluate NHANES and identify data elements that are appropriate for geospatial epidemiologic analysis.

Current Position Data:

The EIS Officer will have immediate access to the GRASP Geospatial Data Warehouse, a data warehouse containing hundreds of national and international GIS data layers spanning physical, cultural, administrative, environmental, demographic, and health care access. The Warehouse includes the GRASP Social Vulnerability Index (SVI), GRASP Environmental Burden Index (EBI) (BETA), GRASP Hazardous Waste Site Boundary Database, and US Census decennial and American Community Survey data. The Officer will receive guidance on the access,

use, and processing of project-specific data and will be instructed on the use of CDC WONDER and the NCEH Environmental Public Health Tracking System.
Position Strengths: The EISO will function as a member of both GRASP and OEHEM. GRASP is a highly-integrated and collaborative team with extensive expertise enabling GRASP to integrate geospatial science and technology concepts, methods, and ideas to public health research and practice. OEHEM is a highly-integrated and collaborative emergency preparedness and response team. The EISO will have full visibility into the many and varied activities required to prepare for, respond to, and recover from environmental public health emergencies ranging from small acute events to large catastrophes affecting tens of thousands.
Staff & Resources: With expertise spanning the breadth of geospatial science and public health emergency management, GRASP and OEHEM will provide the EIS Officer guidance in areas including geography, GIS, computer science, epidemiology, geospatial statistics, cartography, emergency preparedness & response, and environmental health. Additionally, the EISO will receive guidance on the science and practice of developing emergency management techniques that integrate the work of multiple CDC CIOs and federal agencies. The EISO will be considered as a full member of both the GRASP and OEHEM teams.
Special Skills Useful for this Position: To be successful, the following skills and experience are preferred, but not required: (1) geospatial science & analysis (GIS), (2) epidemiology , (3) environmental exposure assessment, (4) public health program development and coordination, (5) public health emergency management, (6) technology and data management. However, as noted, education and/or comprehensive experience in the above is not required. The diverse staff in GRASP and OEHEM will support the EISO by providing guidance, feedback, and input which will enable the EISO to be successful across the span of the assignment.
Domestic Travel: 5% **International Travel:** 5%

National Center for Emerging and Zoonotic Infectious Diseases

The National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) works to prevent illness, disability and death caused by infectious diseases. We focus on known diseases, emerging infections, and zoonoses. Our work is guided by a "One Health" strategy, which recognizes the interconnectedness of microbes and the environment. Through a comprehensive approach, we can attain better health for humans and animals and improve our environment. NCEZID's divisions include broad expertise, so we are able to identify mysterious, and sometimes lethal, illnesses; contain outbreaks that span many states or countries; and save lives. Four divisions within NCEZID are currently recruiting EISOs: Division of Foodborne, Waterborne, and Environmental Diseases; Division of Healthcare Quality Promotion; Division of High-Consequence Pathogens and Pathology; and Division of Vector-Borne Diseases.

NCEZID-DFWED-EDEB-Georgia-2019-01

Primary Supervisor: Danielle Tack, Veterinary Medical Officer, EIS 2010

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Secondary Supervisor(s):

- Jessica Healy, Epidemiologist, EIS 2015
- Beau Bruce, Deputy Branch Chief

Background: As CDC's principal epidemiology and surveillance group for bacterial enteric pathogen tracking and source identification, the Enteric Diseases Epidemiology Branch (EDEB) is ideal for EISOs to experience national-level public health practice and conduct research. EDEB conducts active and passive surveillance for nine pathogens or conditions, including Campylobacter, Clostridium botulinum, Listeria, Salmonella, Shiga toxin-producing Escherichia coli, Shigella, Vibrio, Yersinia, and hemolytic uremic syndrome through national and sentinel (FoodNet) site systems. EDEB also conducts national surveillance of investigated enteric disease outbreaks and resistance among major bacterial pathogens. EDEB staff design and conduct studies to estimate the burden of foodborne illnesses, determine infection sources, assess trends, support outbreak investigations, and evaluate prevention efforts.

EDEB is within the Division of Foodborne, Waterborne, and Environmental Diseases (DFWED) which strives to improve public health through the prevention and control of disease, disability, and death caused by foodborne, waterborne, and environmentally transmitted pathogens. EISOs in the five DFWED branches enjoy the advantages of working closely with their fellow EISOs and the synergy among the division's branches: they may undertake projects in branches other than their own, seek guidance and mentorship throughout the division, and participate in a monthly journal club with Division Director Rob Tauxe (EIS 1983).

Current Work: Investigation of an outbreak of multidrug resistant shigellosis in a retirement community; analysis of antibiotic prescribing for enteric infections using large ambulatory care datasets; investigation of gastrointestinal illness among cruise ship passengers; a study of the cephalosporin treatment failures among patients infected with Shigella strains susceptible to cephalosporins.

Proposed Initial Projects: During the first month in the assignment, EDEB and other Division EISOs will attend a Division course that introduces them to our pathogens, our surveillance systems, and Division staff. The course includes a lecture with advice on the surveillance evaluation that all CDC EISOs must complete as part of EIS training. During the first month, the EISO can begin any of the surveillance projects listed above or propose a different one, discuss and begin work on the analytic projects listed above or other possible projects, including field investigations, with staff.

Proposed Analytic Project:

Initial analytic projects will depend on the EIS officer's background and interests; we can tailor the complexity from descriptive to analytic epidemiology, including multivariate modeling, spatiotemporal analyses, and analyses incorporating molecular data. Examples of possible topics are 1) characterize the epidemiology of campylobacteriosis among the elderly, including analysis of risk factors; 2) describe antimicrobial resistance in reported outbreaks of infections linked to produce; 3) describe the epidemiology of non-O157 Shiga toxin-producing Escherichia coli, including spatiotemporal distributions; 4) create a probabilistic model to assign a likely transmission mode to cases of Vibro infection with unknown transmission; and 5) investigate multidrug resistant Shigella among populations at elevated risk, such as men who have sex with men. Projects typically use existing surveillance datasets with clearly outlined research protocols that have either been previously developed or need only the addition of an analysis plan which will be developed in coordination with analytical and statistical staff. The EISO will have the opportunity to work with various staff""their expertise is wide and deep.

Proposed Field Investigation Project:

We are very supportive of our EISOs expanding their training through field investigations; all our EISOs have participated in field work. EDEB has primary responsibility for outbreaks involving Vibrio species, Clostridium botulinum, and Campylobacter species. Our staff work closely with the Outbreak Response and Prevention Branch on outbreaks caused by resistant pathogens. EISOs may participate in these and other outbreak investigations. Our EISOs have also gone out on Epi-Aids and international or other emergency response deployments led by other Divisions. Examples of field work by recent EDEB EISOs include investigation of Guillain-BarrÃ© syndrome caused by Campylobacter infection in Arizona and Mexico, botulism outbreak in a Mississippi federal correctional facility, cruise ship outbreak of diarrhea, and multidrug resistant Shigella sonnei outbreak at a Vermont retirement community.

Collaborations with local and federal entities are essential to EDEB's surveillance systems and research. Our cooperative agreements provide support to state and local health departments and assure that we will receive data. These relationships give EISOs the opportunity to participate in existing collaborations and to get to know people in other agencies. EDEB's nine active and passive surveillance systems require continuous interaction with local and state health officials to assure accurate data transmission and we provide technical assistance to reporting states. EDEB also has formal collaborations with the Food and Drug Administration (FDA), USDA's Food Safety and Inspection Service (FSIS), universities, and state partners through FoodNet, the Interagency Food Safety Analytics Collaboration (IFSAC), and the Integrated Food Safety Centers of Excellence. The EISO will have opportunities to participate in FoodNet Steering Committee meetings, the FoodNet Annual Vision Meeting, NARMS (National Antimicrobial Resistance Monitoring System, which includes partners at FDA and USDA), and IFSAC technical work group meetings. Topics discussed at these meeting might include developing methods to estimate the percentage of illnesses caused by each pathogen that can be attributed to each food type, challenges resulting from diagnostic laboratories' shift to using culture-independent diagnostic tests, surveillance for hemolytic uremic syndrome, gathering exposure data from patients with Salmonella infection to assess risk factors for resistant infections, and geospatial analyses.

Proposed Surveillance Project:

As a surveillance branch, EDEB has many types of surveillance projects to offer. Potential projects include evaluation of 1) a newly expanded national surveillance program for Shiga toxin-producing Escherichia coli infections; 2) national surveillance of Campylobacter infection before and after it became a nationally notifiable condition in 2015; 3) national enteric diseases data being provisioned through a new informatics pipeline that can identify people with positive diagnostic tests for more than one enteric pathogen; and 4) the overlaps and differences among several surveillance systems for listeriosis.

Current Position Data:

EDEB has multiple national surveillance systems for bacterial enteric pathogens with data ready for analysis. Surveillance systems in the Division are being linked, which is expanding opportunities to include whole genome sequencing and antimicrobial resistance data in analyses.

Position Strengths: EDEB is CDC's lead group for assessing the magnitude of U.S. bacterial enteric diseases and for tracking and identifying sources of those illnesses. Opportunities to work on both urgent and long-term

scientific projects abound! We love our EISOs! Training EIS officers is a core part of EDEB's mission. EDEB and Division staff provide training in enteric diseases, applied epidemiology, biostatistics, R, SAS, and scientific writing. You will join a multidisciplinary group of dedicated colleagues who are excited about their work and also value a balanced life.
Staff & Resources: EDEB is a multidisciplinary branch with mentors who enjoy training EISOs. The branch has ~7 MDs, ~8 PhDs, ~3 DVMs, and ~24 MPH epidemiologists and statisticians with a variety of skill sets. EISOs have access to a broad range of projects and to mentorship by branch staff, and can also work closely with Division statisticians, communicators, and microbiologists.
Special Skills Useful for this Position: Anyone with the background to become an EISO has the skills needed for this position. Physicians, veterinarians, PhD scientists, and nurses have done outstanding work in this branch. We tailor the experience to the officer's training needs and interests in epidemiology, statistics, public health, and scientific communication. Instead of specific skill sets, we primarily seek qualities that lead to an exceptional experience: flexibility, eagerness to learn, willingness to work hard, the ability to work in teams in a fast-paced environment, and a strong desire to improve the public's health.
Domestic Travel: 10% **International Travel:** 10%

NCEZID-DFWED-MDB-Georgia-2019-01

Primary Supervisor: Brendan Jackson, Team Lead, EIS 2010

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Secondary Supervisor(s):

- Karlyn Beer, Epidemiogist, EIS 2014
- Kaitlin Benedict, Epidemiologist

Background: MDB's mission is to prevent and control fungal diseases in the United States and abroad. These diseases are often neglected despite causing high levels of illness and death. Our group is highly collaborative, working with a wide range of partners, including those in state, international, clinical, and research settings, as well as groups across CDC, on a range of topics including:
-Community-acquired diseases (e.g., coccidioidomycosis, histoplasmosis, blastomycosis) common in certain regions
-Fungal diseases in patients with extensive healthcare exposure or severe immunocompromise (e.g., invasive candidiasis, mold infections)
-Opportunistic fungal infections (e.g., cryptococcal meningitis, histoplasmosis) in people living with HIV

We lead outbreak investigations, oversee novel surveillance for fungal infections, conduct analyses to identify risk factors for disease, monitor and evaluate the implementation of large-scale public health programs internationally, and develop and promote fungal disease prevention efforts. Our EIS officers have assisted in the onsite development, execution, analysis, and publication of numerous epidemiological studies in the United States and globally. MDB also has opportunities to work on domestic surveillance on two nationally notifiable diseases and through the Emerging Infections Program. DFWED's Biostatistics and Information Management Activity provides statistical and IT support, and there is extensive laboratory support.
Current Work: -Multistate coccidioidomycosis outbreak in mission groups (Tijuana)
-Candida auris transmission (New York)
-Injection drug use as candidemia risk factor (Tennessee)
-Analysis of fungal disease-related deaths
-Estimating burden of candidemia in the Uni
Proposed Initial Projects: We believe in tailoring an officer's experience to their talents and needs, so we will discuss and agree upon initial projects at the start of EIS. We want officers to branch out and learn new skills

while still having the chance to leverage their experience. Two projects that would provide an excellent introduction to governmental public health are the coccidioidomycosis surveillance summary and any of the surveillance projects.

Proposed Analytic Project:

EIS officers in MDB have many opportunities for analytic projects. Ethics approval will not present a barrier to any of the proposed projects, and protocol development time will be minimal, if any.

Proposed analyses:

- Surveillance summary of national coccidioidomycosis cases, including temporal-based analysis by geography, age, and sex.
- Multivariable analysis to examine patient characteristics and underlying conditions associated with specific invasive mold infections.
- "˜Big data' study to assess clinical manifestations and diagnostic and treatment practices for blastomycosis using a large health insurance database.
- First multistate surveillance summary for blastomycosis to evaluate geographic and temporal trends.
- Geographic and socioeconomic analysis of candidemia to assess reasons for large racial disparities in incidence. Multivariable modeling needed to assess confounding and effect modification by poverty, geography, and comorbid conditions in assessing relationship between race and incidence.
- Evaluate factors associated with recurrent candidemia.
- Assessment of candidemia treatment practices in accordance with national treatment guidelines.

In addition to the analyses proposed above, the EISO will almost certainly have the opportunity to conduct a "˜soup-to-nuts' analysis based on fieldwork for an Epi-Aid or other urgent response. The following section provides examples of such projects by current officers. In each, the officer gained experience in study and questionnaire design, use of REDCap and R, and tests of association, including controlling for confounding.

Proposed Field Investigation Project:

Officers in MDB have ample opportunities for primary collection in field investigations, with each officer typically doing 1--4 field investigations per year. In fact, our branch is typically looked to as a source of opportunity for officers from other branches to gain field experience. We also support our officers joining field investigations with other groups to gain additional experience. Here are examples of this field work from the past 18 months:

- Investigated a multistate outbreak of coccidioidomycosis (Valley fever) among youth mission groups who traveled to Tijuana. Traveled to two states to perform a cohort-based serologic survey to identify risk factors.
- In response to finding high levels of transmission of Candida auris (a fungal "˜superbug') in nursing homes caring for patients with highly complex medical needs, conducted a cohort study to determine risk factors for acquiring colonization.
- After identifying a three-fold increase in the proportion of candidemia cases in a surveillance site associated with injection drug use (IDU), conducted a case-case analysis comparing IDU-related candidemia cases to those without IDU. Also used modeling techniques to estimate the denominator of people who inject drugs within the study area.
- Created surveillance and conducted a knowledge, attitudes, and practices survey for invasive mold infections following flooding and indoor mold growth from Hurricane Harvey.
- Investigated a cluster of mucormycosis at an academic medical center.

MDB has a long history of working closely with health departments and local and international partners. As a small branch with a large mission and a flexible outlook, we place great trust in our officers to work independently. In addition to the collaboration though field investigations described above, officers can participate in work to prevent opportunistic fungal infections around the world (e.g., Candida auris in South Africa and India, histoplasmosis in Latin America, cryptococcal meningitis in Africa) and a wide variety of other projects.

A few recent examples:

- One officer worked with the European CDC on a rapid assessment of aspergillosis in the setting of influenza, having worked closely with European clinical experts who first identified the issue.
- This officer also traveled to Japan, where she met with the discoverer of Candida auris and, through a series of meetings and connections (fluent Japanese being an asset), helped initiate an East Asia meeting on its control.
- Another officer traveled to Brazil to meet with local experts on an emerging zoonosis caused by Sporothrix brasiliensis, which is causing an epidemic in several Brazilian cities of severe cutaneous infections that spread between cats and to humans (and may be coming to a city near you). As a product of this work, he will be helping the country to organize the first One Health governmental conference in that country, linking public health officials to veterinarians and physicians.

Proposed Surveillance Project:

The officer may select one of several surveillance evaluation ideas according to their interest. We in MDB take officers' surveillance evaluation seriously and make changes based on the results.

- Evaluate implementation of the first national case definition for histoplasmosis in the dozen states where it is reportable. The officer would be encouraged to speak with epidemiologists in each of these states, as well as with experts from CDC's surveillance center to better understand the context of nationally notifiable disease surveillance. As part of this work, the officer could have the chance to work with states to create a harmonized list of variables"”for example, about environmental exposures and clinical features"”that could be used in standardized enhanced surveillance.
- Evaluate pilot surveillance for invasive mold infections (e.g., aspergillosis, mucormycosis) at the Georgia Emerging Infections Program site. The proximity of this surveillance would allow for in-person interviews and site visits. This ambitious young program has the difficult task of using not only culture for case identification but also histopathology, and specimens from both are sent to CDC. An even more difficult task is the case ascertainment process in which surveillance staff must determine whether each possible case represented a true infection vs. colonization (a "sheep in wolf's clothing"□).
- Evaluate surveillance for resistant Candida infections through the two-year-old Antibiotic Resistance Laboratory Network (ARLN), a network of seven public health laboratories that regionally serve the country, testing isolates from clinical laboratories for antifungal resistance and also helping identify new and emerging Candida species.

Current Position Data:

- National surveillance data for coccidioidomycosis
- New national surveillance data for Candida auris
- ARLN data on resistant Candida infections
- EIP surveillance for candidemia in 10 sites and for invasive mold surveillance in one site
- Access to MarketScan commercial claims data, used in "˜big data' analyses
- Access to national data on fungal disease-related hospitalizations and deaths

Position Strengths: - High degree of individual attention and support from a close-knit group.
- Wide variety of experiences with high degree of autonomy, while still having strong safety net.
- Ability to tailor an EIS officer's experience to the skills she or he wants to develop.
- Staff has strong writing, presentation, and analytic skills and promotes the same in their officers.

Staff & Resources: Our position is on MDB's Epidemiology Team, with about a dozen epidemiologists focused on a wide array of fungal diseases. We work closely with the Fungal Laboratory Team, including two staff who split time between the teas. Officers have close communication with superb, easily-accessible staff, including PhD-level biostatisticians, epidemiologists, laboratorians, and health communicators. Secondary supervisors have experience with "˜big data' analysis. Team and branch chief have extensive experience with outbreak investigations. Ready access to ~10 other EIS officers in the division.

Special Skills Useful for this Position: Because we can tailor our position, it can be a great fit for anyone willing to be flexible and creative. We are looking for EIS officers who are scientifically inquisitive, flexible, and eager to learn. EIS officers should be able to work both independently and closely within a team. A clinical background may be useful but is not essential, and EIS officers without such a background have had excellent experiences. Fluency in another language is helpful but not required.
Domestic Travel: 15% **International Travel:** 10%

NCEZID-DFWED-ORPB-Georgia-2019-01

Primary Supervisor: Megin Nichols, Activity Lead, EIS 2008

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Secondary Supervisor(s):

- Colin Basler, Veterinary Epidemiologist, EIS 2013

Background: The Outbreak Response and Prevention Branch (ORPB) is responsible for outbreak investigations related to a wide variety of organisms/syndromes, whether transmitted by food, animal contact, or other routes. Detecting and investigating outbreaks is exciting and requires logical thinking and strong curiosity. Shoe-leather epidemiology, conducting epidemiologic studies, and close collaboration with a diverse group of partners are essential to solving outbreaks. ORPB is on the forefront of applying new techniques like whole genome sequencing to investigate and solve outbreaks. Our work drives enactment of policies and regulations that improve food safety and leads to changes in the animal production/pet industries to better protect animal and human health. ORPB typically monitors 20-60 potential clusters of illness each week. An area of emerging concern is the transmission of enteric zoonoses: domesticated or wild animals may appear healthy even while shedding pathogens, making control and prevention challenging. A One Health approach, one that integrates multiple disciplines to attain optimal health for people, animals and the environment, is becoming an increasingly important part of the Branch strategy to decrease human illness from animal sources. For more information on ORPB enteric zoonoses investigations: https://www.cdc.gov/ncezid/dfwed/orpb/eza.html
Current Work: 1. Epi-Aids: Multistate Campylobacter jejuni illness outbreak linked to puppies; Salmonella infections linked to live poultry, Michigan 2018

2. Surveillance: Adverse outcomes among salmonellosis cases linked to poultry, 2015--2016
3. Presentations: Tuesday Morning Seminar and EIS Conference
4. Publication: Outbreak of Salmonella Enteritidis Infections Linked to Guinea Pigs

Proposed Initial Projects: Within the first month of starting the assignment the Officer will attend an introduction to the work of the Division. The Officer will have the opportunity to hear about the work conducted across the Division and participate in discussion with staff working on a variety of projects. The Officer will have access to data for the surveillance project mentioned above, and have support from supervisors to begin work on the project. The Officer will also attend regular cluster meetings and will work with Branch epidemiologists on ongoing outbreak investigation.
Proposed Analytic Project:
Reptile- and Amphibian-associated salmonellosis in the United States, 2007--2018
During 2007--2018, CDC received reports from state health departments regarding Salmonella infections in persons who had contact with reptiles (e.g., lizards, snakes, and turtles). Salmonella infections usually cause gastroenteritis but can result in invasive illness (e.g., septicemia and meningitis), especially in infants and immunocompromised persons. For decades, reptiles have been known as a source for salmonellosis; however, numerous reptile owners remain unaware that reptile contact places them and other household members, including children, at greater risk for salmonellosis. Increasing evidence suggests that amphibians (e.g., frogs, toads, newts, and salamanders) also can pose risks for salmonellosis in humans. This report describes cases of

reptile-associated salmonellosis, offers recommendations on preventing transmission of Salmonella from reptiles and amphibians to humans. Descriptive analysis and multivariable modeling will be conducted to compare outbreaks linked to reptiles and amphibians to those linked to all other animal species. Demographic variables of interest include age, sex, and state of residence. Outbreak characteristics for comparison will include outbreak duration, and outbreak size (number illnesses and number states involved). Results will be presented in a peer-reviewed publication.

Proposed Field Investigation Project:

ORPB is a key leader in the national network of public health officials who investigate enteric illness outbreaks by facilitating rapid exchange of information and coordinating multistate investigations. We collaborate with the Enteric Diseases Laboratory Branch, the Enteric Diseases Epidemiology Branch, Waterborne Disease Prevention Branch, and other groups in DFWED. We provide guidance and support to state, local, and territorial public and animal health agencies to improve outbreak surveillance, detection, and response and routinely collaborate with regulatory agencies such as the Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA). ORPB is continually developing new tools to more rapidly detect, visualize, and analyze illness clusters. Primary data collection is an integral part of outbreak investigation. Opportunities for previous EISOs have included both domestic Epi-Aids to investigate outbreaks and in-office multistate illness outbreak investigations. The most recent Officer participated in one Epi-Aid each year including: a multistate outbreak of human Campylobacter jejuni linked to contact with puppies from a national pet store chain (Ohio 2017) and investigation of risk factors for Salmonella infections linked to live poultry (Michigan 2018).

ORPB EISOs interact with state foodborne and zoonotic disease epidemiologists on a daily basis when investigating outbreaks. Data from outbreak investigations are collected by state and local health departments, regulatory authorities, and public health laboratories, and are shared collaboratively through electronic data aggregation platforms. EISOs will work with health departments via phone, electronic communication, or in-person during Epi-Aids to collect, analyze and interpret data. As many of the pets and animals that might be the vehicle for an outbreak pathogen do not fall under a single regulatory entity, CDC plays a unique role in the detection, investigation, and prevention of illness outbreaks. As a result, the EIS Officer in this position will have opportunities to engage with stakeholders such as the National 4H Congress, Food and Drug Administration, USDA's Animal and Plant Health Inspection Service (APHIS), Pet Industry Joint Advisory Council, state Departments of Agriculture, and university partners on a variety of projects including providing input on guidance documents, serving on committees and providing technical assistance during outbreak investigations. Additionally, through the investigation of foodborne outbreaks, there are opportunities to engage with the ORPB Prevention Effectiveness Activity, a new group within the Branch, designed to engage with food companies, health departments, and Food Safety Centers of Excellence in states to use a data-based approach to learn from foodborne illness outbreaks and drive prevention and policy activities.

Illness outbreak investigations provide an opportunity to learn lessons and prevent future outbreaks. EISOs in this Branch are on the frontlines of these activities.

Proposed Surveillance Project:

Raw meat pet food diets have grown in popularity in recent years. Enteric pathogens including Salmonella, E.coli, Campylobacter, and Listeria have been isolated from these pet foods and have led to a number of pet food recalls. In addition to ill animals, we have recently seen human illnesses associated with these recalled raw pet foods. Some of these pet food-associated illnesses have been part of larger raw chicken- and raw turkey-associated outbreaks. Pet food products, including raw pet foods, are regulated by the FDA's Center for Veterinary Medicine (FDA-CVM). This surveillance project would focus on how consumer complaints lead to the identification of pathogens in raw pet foods and how that information is merged with clinical and epidemiologic data to identify human illnesses and outbreaks associated with raw pet food products. The results of this surveillance system evaluation will greatly impact how data is collected and shared between agencies and will hopefully impact identification and investigation of human outbreaks associated with raw pet foods.

Current Position Data:

ORPB has data available to officers regarding multistate illness outbreaks of Salmonella, Listeria, and E.coli linked to animal contact. Additional datasets are available within DFWED and through intra/inter-agency collaborations with groups such as the National Outbreak Reporting System and PulseNet, the national molecular subtyping network for foodborne disease surveillance.
Position Strengths: ORPB offers an exciting EIS experience, where EISOs can lead outbreak investigations from start to finish. These outbreaks frequently present new an unexpected challenges and often require shoe-leather epidemiology. EISOs will work in a strong team environment in a Branch that values work-life balance and where there is a long-standing commitment to mentoring EISOs. All Officers are offered formal training in enteric diseases, biostatistics, scientific writing, and media/communications.
Staff & Resources: ORPB has a staff of veterinarians, physicians, and doctoral level epidemiologists with experience in state, federal, and international public health settings. EISOs will work closely with ORPB staff and colleagues in other DFWED Branches and in FDA, USDA, and other federal entities. EISOs will also interact with industry stakeholders and university colleagues during their EIS tenure.
Special Skills Useful for this Position: EISOs from all backgrounds including physicians, veterinarians, doctoral scientists, and nurses have made major public health impacts with ORPB. To a great degree, your EIS experience can be tailored to your specific needs and goals. EISOs who are flexible, eager to learn, willing to work hard, and able to work in teams in a fast-paced environment will get the most out of an EIS assignment in ORPB. Other useful skills include the ability to be diplomatic, to work on multiple projects concurrently, to work both independently and as part of a team, and excellent communication skills.
Domestic Travel: 10% **International Travel:** 10%

NCEZID-DFWED-WDPB-Georgia-2019-01

Primary Supervisor: Jennfier Cope, Medical Epidemiologist, EIS 2009

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Secondary Supervisor(s):

- Sarah Collier, Analytic Epidemiologist

Background: The Division of Foodborne, Waterborne, and Environmental Diseases (DFWED) strives to improve public health through the prevention and control of disease caused by foodborne, waterborne, and environmentally transmitted pathogens. EISOs in DFWED enjoy several advantages resulting from the synergy between the various groups comprising the Division. DFWED's Biostatistics and Information Management Office provides statistical support; the Enteric Diseases Laboratory Branch and the Water, Sanitation, and Hygiene (WASH) Laboratory Team provide laboratory expertise; the Division conducts journal club and other didactic activities for EISOs, as well as monthly seminars.

Domestically, WDPB leads response for domestic WASH-related diseases, and case and outbreak investigations that include cryptosporidiosis, giardiasis, shigellosis, and infections caused by Cronobacter, and free-living amebas (e.g., Acanthamoeba, Naegleria fowleri); recent outbreak investigations are listed at www.cdc.gov/ncezid/dfwed/waterborne/investigations.html. The Domestic WASH Epidemiology Team focuses on public health issues related to drinking water, recreational water, and hygiene-related diseases; participates in multiple national surveillance systems (e.g., National Outbreak Reporting System, One Health Harmful Algal Bloom System); provides clinical consults; prepares waterborne burden estimates; and works on health communications and policy.

Current Work: Responses to outbreaks of shigellosis during Flint, MI water crisis, MDR shigellosis in VT retirement community; norovirus among PA festival attendees, melioidosis and leptospirosis in U.S. Virgin

Islands after hurricanes, opioid-associated candidemia in TN; multi-year review of cryptosporidiosis outbreaks, analysis of giardiasis using health insurance data, Naegleria fowleri case investigations.

Proposed Initial Projects: The officer assigned to this position can expect to start working on their surveillance evaluation (see project options above) in the first month of the assignment. Additionally (acknowledging this cannot be promised for the future), the past 5 officers in this position have deployed to the field in their first 3 months of the assignment, demonstrating the team's flexibility in allowing the officer to seize these opportunities when they present.

Proposed Analytic Project:

Multiple analytic projects have been developed for the incoming EISO. All projects have been designed to be adjusted depending on the EISO's analytic background and interests. Examples include: 1) Use a "big data" approach to examine chronic sequelae of cryptosporidiosis, using MarketScan (very large health insurance billing database) data (would involve multivariable modeling and time-series analysis); 2) Use a "big data" approach to determine the prevalence of contact lens-associated eye infections, using MarketScan and Healthcare Utilization Project (HCUP) data (would involve multivariable Poisson regression and a weighted analysis using complex sample surveys); 3) Analyze the occurrence of outbreaks associated with groundwater before and after implementation of the Environmental Protection Agency's Ground Water Rule; 4) Conduct sub-analyses of a completed epidemiologic study investigating health effects associated with low pressure events in drinking water distribution systems; 5) Advance the use of the first estimate of waterborne disease burden in the United States. Analytic methods for projects 3--5, and other available projects, could include multivariable modeling, time-series modeling, and analyses of effect modification. Additional analyses may result from primary data collection done in the field or as part of an outbreak response as was done on recent shigellosis outbreak investigation in Flint, MI and Vermont.

Proposed Field Investigation Project:

Past EISOs in this position have had multiple opportunities to fulfill the Field Investigation CAL both within the position and beyond. These opportunities have included Epi-aids for outbreaks of Elizabethkingia spp. in Wisconsin, shigellosis in the setting of Flint, Michigan water crisis (case interviews), multi-drug resistant shigellosis in a Vermont retirement community (case and control questionnaires/interviews), norovirus among festival attendees at a PA camp, and Naegleria fowleri case investigations. The team has also supported current and past EISOs in pursuing opportunities outside the team that have included Epi-aids for melioidosis and leptospirosis in U.S. Virgin Islands after hurricanes, candidemia among injection drug users in Tennessee, cholera and typhoid fever outbreaks in Zimbabwe (with the WDPB global team), and Emergency Operation Center (EOC) deployments for Zika and Ebola.

WDPB values collaborations with public health partners and places a high level of importance on cultivating and maintaining partnerships. We work closely with many CDC Divisions and Centers (environmental health, respiratory diseases, healthcare quality promotion, STD prevention, preparedness and emergency response, injury, One Health office), state, local, territorial, and tribal reporting partners, other federal agencies including FDA and EPA and a variety of external partner organizations including Council for State and Territorial Epidemiologists (CSTE), American Water Works Association (AWWA), and the American Academy of Ophthalmology. These collaborations vary in their nature and can include:

o Translating surveillance data, providing technical expertise on health effects of waterborne disease, and partnering on efforts to prevent waterborne disease

o Regular (i.e., quarterly, monthly, etc.) or ad hoc calls/webinars to update on current work and emerging issues

o In person meetings when partners visit CDC headquarters

The EIS role in these collaborations can vary and might include:

- Team member and representative
- Project lead for content partners may be interested in
- Observer/learner/critical thinker
- Professional consultant based on previous training (e.g., clinical/veterinary perspective, epidemiologic expert, etc.)

Proposed Surveillance Project:

1) One Health Harmful Algal Bloom System (OHHABS) evaluation

The One Health Harmful Algal Bloom System (OHHABS) is a voluntary reporting system available to state and territorial public health departments and their designated environmental health or animal health partners. It collects data on individual human and animal cases of illnesses from HAB-associated exposures, as well as environmental data about HABs. The goal of OHHABS is to collect information to support the understanding and prevention of HABs and HAB-associated illnesses. OHHABS was launched in June 2016 and this proposed surveillance evaluation would be the first formal evaluation of OHHABS.

2) Improving cryptosporidiosis, giardiasis, or shigellosis outbreak reporting to the National Outbreak Reporting System (NORS) (the EISO can choose which pathogen to focus on for a surveillance evaluation).

The Centers for Disease Control and Prevention (CDC) launched NORS in 2009 as a web-based platform into which health departments enter outbreak information. Through NORS, CDC collects reports of enteric disease outbreaks caused by bacterial, viral, parasitic, chemical, toxin, and unknown agents, as well as foodborne and waterborne outbreaks of non-enteric disease.

3) Shigellosis case surveillance evaluation

Data for shigellosis cases is captured in several different surveillance systems at CDC including the National Notifiable Diseases Surveillance System (NNDSS). This project would evaluate shigellosis case reporting to NNDSS in anticipation of this system being modernized.

These proposed evaluations will be conducted in Atlanta and could include phone-based discussion with state and local partners, and in-person discussions with internal stakeholders.

Current Position Data:

Multiple types of datasets are readily available and accessible within the first month of the EISO's assignment for analysis within the team, including 1)"big data" sources such as the Nationwide Inpatient Sample, Nationwide Emergency Department Sample, and MarketScan, 2) case surveillance data such as the National Notifiable Diseases Surveillance System and national data on free-living ameba and Cronobacter infections, and 3) outbreak data from NORS and OHHABS. Projects might also lead to primary data collection.

Position Strengths: Solid grounding in the essentials of waterborne diseases, public health surveillance, and epidemiology while working with experienced, dedicated, and caring epidemiologists, physicians, veterinarians, nurses, microbiologists, environmental health practitioners, engineers, and statisticians. Emphasis on collaborative and collegial working environment. The position offers a robust set of proposed projects while allowing the EISO to identify and pursue areas of interest within the branch and division (or beyond). The team has experience supervising EISOs and will meet the officer wherever they are at with their epidemiology and public health skills.

Staff & Resources: The Domestic WASH Epidemiology team is made up of 7 FTEs serving as program leads and subject matter experts supported by multiple contractors and fellows, as well as our second-year EISO. Whether designated as supervisors or not, all FTEs participate in the training of the EISO and offer expertise in data management and analysis, waterborne disease pathogenesis and epidemiology, and development of scientific manuscripts and presentations.

Special Skills Useful for this Position: We welcome EISOs from diverse backgrounds (the position has been previously filled by EISOs who are PhDs, MDs, and DVMs) who are interested in addressing fundamental issues in waterborne diseases and public health surveillance in the United States and learning analytic, presentation and scientific writing skills. EISOs who are flexible, eager to learn, willing to work hard, and enjoy working on collaborative teams in a fast-paced and busy environment will get the most out of the opportunities we provide. Our Branch values passionate and creative people!

Domestic Travel: 20% **International Travel:** 0%

NCEZID-DFWED-WDPB-Georgia-2019-02

Primary Supervisor: Matthew Lozier, Epidemiologist, EIS 2012

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Secondary Supervisor(s):

- Grace Appiah, Medical Epidemiologist, EIS 2014
- David Berendes, Epidemiologist

Background: The Division of Foodborne, Waterborne, and Environmental Diseases (DFWED) strives to improve public health nationally and internationally through the prevention and control of diseases caused by foodborne, waterborne, and environmentally transmitted pathogens. EISOs in DFWED enjoy several advantages resulting from the synergy between the various groups comprising the Division. EISOs may undertake select projects in branches other than their own in the Division. The Waterborne Disease Prevention Branch (WDPB; http://www.cdc.gov/ncezid/dfwed/waterborne/index.html) offers this position with the Global WASH Epidemiology Team.

Within the Center, WDPB leads coordination and response for water, sanitation, and hygiene (WASH)-related diseases, including 11 priority pathogens. WDPB works globally on: evaluating and promoting WASH interventions, including point-of-use drinking water treatment such as CDC's Safe Water System (https://www.cdc.gov/healthywater/global/household-water-treatment.html); documenting the health and developmental benefits of handwashing; integrating safe water and hygiene into school and healthcare settings in developing countries; integrating WASH into cholera and typhoid vaccination campaigns; building capacity within Ministries of Health for epidemic cholera and typhoid outbreak prevention and response; and participating in global initiatives to end cholera. Recent outbreak investigations include typhoid fever (Zimbabwe 2018, 2017, and 2016), and cholera (Zimbabwe 2018, Zambia 2017, Ethiopia 2016, and Tanzania 2015--2016). More outbreak investigations listed here: http://www.cdc.gov/ncezid/dfwed/waterborne/investigations.html.
Current Work: EISO projects include responses to outbreaks of cholera and typhoid fever in over 10 countries, analyses of GEMS case-control study of moderate-to-severe diarrhea, surveillance for acute febrile illness in Uganda, evaluations of interventions to improve water, sanitation and hygiene in health care facilities in Kenya, Ghana, Zambia, Mali and Uganda.
Proposed Initial Projects: 1) Prepare for surveillance system evaluation in Kenya or Haiti; 2) Investigate and respond to waterborne disease outbreaks internationally (if an outbreak occurs); 3) Evaluate the impact of handwashing and drinking water stations, improved water supply and sanitation, or bulk chlorination in healthcare facilities (HCF) in Kenya; 4) Evaluate the feasibility and acceptability of container-based sanitation systems in outpatient and inpatient facilities in healthcare facilities; 5) Evaluate health impacts of a novel container-based sanitation system with solar waste treatment in households in Kenya; 6) Explore previous GEMS publications and choose an analytic project from within the GEMS and VIDA databases.
Proposed Analytic Project:
Officers can expect to analyze data from outbreak investigations, research studies and surveillance systems, and will have many opportunities for descriptive and analytic epidemiologic investigations, including multivariate analyses. WDPB has been a leading co-investigator in the Global Enteric Multicenter Study (GEMS), the largest global case-control study of etiologies of childhood diarrheal diseases, with data collection from seven developing countries. In addition, the Vaccine Impact on Diarrhea in Africa (VIDA) study followed GEMS in three sites after rotavirus vaccine implementation. Officers will have opportunities to analyze the rich, site-specific datasets from the Kenya GEMS/VIDA site. There are numerous analytic questions of importance to pediatric diarrheal diseases to be explored with these data. Officers also gain experience in developing data analysis plans to evaluate risk factors associated with these studies using software for data management and interpreting and presenting their findings to inform public health action.

Recent and current officers have manuscripts in preparation based on their analytic work, including analyses of GEMS data; evaluating infectious and nutritional status sequelae of moderate to severe diarrhea; examining mortality associated with moderate-to-severe diarrhea; examining risk factors associated with Cryptosporidum spp. infection in children with moderate-to-severe diarrhea; assessing the acceptability of a novel water distribution system in Kenya; characterizing risk factors for cholera-associated mortality during an outbreak in Zambia; and evaluating and investigating the association between nutritional markers and cholera infection based on serologic data.

Proposed Field Investigation Project:

WDPB officers have the quintessential EIS field investigation experience through outbreak emergency response deployments. Officers in the field have many opportunities for primary data collection and fulfillment of the field investigation CAL. These include collecting and analyzing data from: publicly available medical records, questionnaires administered during case-control studies, Knowledge, Attitude and Practices (KAP) studies, medical chart reviews during field investigations, and in-depth interviews and surveys conducted for WASH evaluations in healthcare facilities in developing countries. Officers typically deploy for 2 to 6 weeks for cholera and typhoid outbreak responses. Officers also have opportunities for data collection from evaluation of WASH interventions in low-income settings, including low-income urban settings and healthcare facilities. Recent projects with primary data collection led by our officers include: case-control studies on risk factors for infection and mortality during cholera outbreaks in Zambia, Ethiopia, and Tanzania; a KAP survey of clinicians during a cholera vaccine webinar; qualitative analysis to assess the acceptability of a novel water distribution system; and mixed-methods assessments of hand hygiene and sanitation interventions in healthcare facilities.

Officers will have numerous opportunities to work closely with public health partners, including Ministries of Health, WHO, NGOs, the private sector, and many CDC Divisions/Centers (including CDC country offices), especially through collaboration during field investigations. Officers travel globally to provide technical assistance in cholera and typhoid outbreaks; work on-site with international partners to provide training in waterborne disease detection and prevention; and participate in meetings and conferences with global health stakeholders at CDC and when working in the field in other countries. Specifically, officers have worked closely with the International Research Centre for WASH (IRC-WASH), local Ugandan district governments, and the Infectious Diseases Institute at Makerere University on hand hygiene projects in Ugandan healthcare facilities; with local Kenyan district government, Sanivation, and the Safe Water and AIDS Project (SWAP) on sanitation facility projects in Kenyan healthcare facilities; as well as with Shining Hope for Communities (SHOFCO) on assessing the acceptability of a novel water distribution system in Kenya. WDPB also collaborates extensively with academic WASH partners around Atlanta, GA, including faculty at Georgia Tech, Emory, and Georgia State, on international WASH projects, including data sharing and co-led analyses.

Proposed Surveillance Project:

1) The Population Based Infectious Disease Surveillance (PBIDS) system has conducted active surveillance for febrile illness, pneumonia, diarrhea, and jaundice in an urban informal settlement (Kibera, Nairobi) and a rural area (Lwak, Nyanza province) in Kenya since 2005. PBIDS is comprised of household surveillance and clinical surveillance. Initially, household surveillance occurred every two weeks and currently households are visited every six months. Clinic surveillance occurs at a designated referral clinic at each surveillance site where participants can receive free health care. Circumstances permitting, an incoming EISO will travel to Kenya in the fall to work with the CDC-Kenya office to evaluate diarrheal disease surveillance in PBIDS. 2) In 2018, Haiti reported <4,000 cholera cases, the lowest annual total since the cholera epidemic began in 2010, and approximately 1% of the total reported in 2011. Haiti is now entering the final phase of its National Cholera Plan with a goal of less than 100 cases by 2022. Circumstances permitting, an incoming francophone EISO will travel to Haiti in the fall to evaluate the cholera surveillance system. The evaluation will take into account a change in the cholera case definition implemented in 2018, and the need to enhance surveillance to help Haiti reach its 2022 goal. Both proposed surveillance evaluations will require in-person interviews with key stakeholders, data analyses, and discussions with internal and international partners via email and phone for pre-visit planning and post-visit assessment of findings and recommendations.

Current Position Data:

A dataset containing >1,500 children with moderate-to-severe diarrhea and >2,000 controls matched by age, sex, and location, from the previously described GEMS study's Kenya site, and a somewhat smaller data set from the VIDA study Kenya site. In addition, pan-site datasets can be accessed for either study. Datasets from previous outbreak investigations, WASH intervention evaluations, and other healthcare facility studies are also accessible and may be available for analytic projects.
Position Strengths: The Global WASH Epidemiology Team at WDPB is a collaborative and collegial team to work with. There is a combined 74 years of post-EIS applied epidemiology expertise among 5 former EISOs. We have solid grounding in the essentials of waterborne diseases, sanitation, and hygiene, applied global health, and epidemiology while working with experienced, dedicated epidemiologists, microbiologists, environmental health practitioners, engineers, and statisticians. This position encourages and provides learning opportunities include weekly biostatistics and Division seminars, and training in using software for data capture (MaxQDA, ODK, EpiInfo) and statistical analysis (SAS and R), and scientific presentations and writing.
Staff & Resources: EISOs will have access to seven EIS alumni staff in WDPB (and many more in our sister Branches), the Division's Biostatistics and Information Management Office for statistical support, the Enteric Diseases Laboratory Branch and the Waterborne Disease Laboratory Team for laboratory expertise, a support person for data collection, database creation and data management, communications specialists (WDPB Health Promotion Team), and administrative support.
Special Skills Useful for this Position: We welcome EISOs from diverse backgrounds who are interested in addressing fundamental issues in global waterborne diseases and public health surveillance, and learning analytic, presentation and scientific writing skills. EISOs who are flexible, eager to learn, willing to work hard, and enjoy working on collaborative teams in a fast-paced and busy environment will get the most out of the opportunities we provide. Our Branch values passionate and creative people!
Domestic Travel: 5% **International Travel:** 35%

NCEZID-DHCPP-BSPB-Georgia-2019-01

Primary Supervisor: Maria Negron Sureda, Veterinary Medical Officerd

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Secondary Supervisor(s):

- Ilana Schafer, Epidemiologist, EIS 2012
- Johanna Salzer, Veterinary Medical Officer

Background: The mission of BSPB is to prevent illness, disability, or death caused by bacterial zoonotic diseases or unusual bacterial pathogens in the US and around the world. BSPB personnel conduct domestic and international outbreak investigations, evaluate and help establish surveillance activities, perform risk factor studies, analyze policy strategies and build capacity for public health control and prevention programs for our diverse group of diseases. BSPB also supports CDC biopreparedness efforts for our pathogens that have the potential for use as bioweapons.

The Bacterial Special Pathogens Branch (BSPB) is composed of an epidemiology team and two laboratory teams. BSPB is responsible for a diverse group of non-vector-borne bacterial infections and disease syndromes of domestic and international public health importance. We are organized into programs on:

1) Bacterial zoonoses (e.g. anthrax, brucellosis, leptospirosis)
2) Novel, rare and unusual emerging bacterial infections (e.g. melioidosis, mycetoma, Capnocytophaga sp.)
3) Non-tuberculous mycobacterial diseases (leprosy, Buruli ulcer, and zoonotic species)

Current Work: -Determining Seroprevalence and Risk Factors for Leptospirosis -- United States Virgin Islands (2019)

- Three Geographically-Distinct Anthrax Outbreaks in Humans and Livestock -- Uganda (2018)

- Anthrax Outbreak in Hippopotami and Cape buffalo -- Namibia (2017)
- Brucella abortus strain RB51 Transmitted Through Raw Milk -- Texas (2017)

Proposed Initial Projects: 1) Analyze and write manuscript on effect of chest drainage on survival using systematic review anthrax database

2) Analysis and mapping of historical BSPB leptospirosis laboratory data going back 10 years

3) Develop B. abortus RB51 surveillance system for human exposure and cases

4) Evaluating de cost-effectiveness of different brucellosis diagnostic algorithms in humans

5) Improve passive surveillance, conduct active surveillance, animal reservoir and environmental studies, conduct retrospective investigation of post-hurricane cases/case burden, conduct risk factor analysis for leptospirosis and melioidosis post-hurricane outbreaks 2017.

Proposed Analytic Project:

The prospective EISO will perform descriptive statistics and multivariate analysis for the analytic projects described below:

a. Determine predictors for disease severity in Anthrax cases. The EISO will need to first extract data from articles identified in a systematic literature review of anthrax cases.

b. Determine what factors are associated with Norcardia drug resistance

c. Determine factors that are associated with Leptospira seropositivity in people residing in the US Virgin Islands.

Data for analytic projects b & c described above are already collected and ready to be analyzed by the time the EISO comes on board. All projects are potential first-author publications for EISO.

Proposed Field Investigation Project:

1) Leptospirosis and melioidosis capacity building and investigations in response to post-hurricane outbreaks in Puerto Rico and USVI in 2017. Potential projects may include: improve passive surveillance, conduct active surveillance, animal reservoir and environmental studies, and conduct retrospective investigation of post-hurricane cases/case burden.

2) BSBP supports EISOs participation in Epi-Aids and emergency response deployments. In some instances, Epi-Aid could also provide an excellent opportunity to design and conduct small scale epidemiological studies that could answer important questions related to the response in a timely manner. Examples of previous Epi Aids/Response deployments include:

a. Design and collect exposure data and PEP adherence during the 2017 RB51 investigation in Texas (in conjunction with our State partners)

b. Validate in a field setting the use of rapid test for anthrax during an outbreak in Namibia (in conjunction with Namibian Government, CDC Country Office and NGOs)

c. Uganda deployment to assist Viral Special Pathogens Branch during the Ebola Epidemic in DRC.

The opportunities available can be tailored to the EIS officer's interest. Our position offers both field and laboratory investigations for a wide range of infectious disease pathogens with varying clinical presentations and multiple routes of exposure and risk factors. Current EISO lead two anthrax multisectoral investigations (Namibia and Uganda) and assisted our state partners in two field investigation (melioidosis and brucellosis). Internationally, we work closely and provide technical assistance to Ministries of Health and Agriculture worldwide (e.g. Bangladesh, Colombia, Cameroon, India, Jordan, and Uganda). The EISO's role will be to provide technical assistance to our partner countries related to surveillance, trainings and conducting projects. Recently, BSPB and OHO at CDC and FAO Rome developed an assessment tool, the Staged Tool for the Elimination of Brucellosis (STEB) that evaluates current country capacity to prevent and control brucellosis using a One Health Approach. The EISO's role will be to be part of the team conducting these evaluation workshops in countries who request this. Since its inception we have conducted this workshop in SE Asia, Pakistan and Ethiopia.

Proposed Surveillance Project:

1) Projects readily available for Surveillance Evaluation CAL:
a. Compare NNDSS (national surveillance data) to BSPB surveillance data (leptospirosis & brucellosis data)
b. Evaluate Hansen's disease old surveillance system versus new electronic-based system
2) Develop a plan for mycetoma surveillance and diagnostic capacity
3) Projects that include site visit:
a. Colombia:
i. Develop a melioidosis surveillance system and expand diagnostic capacity in "˜high risk' areas
ii. Evaluate the national leptospirosis surveillance program
b. Cameroon:
i. Work with the Ministry of Health to enhance anthrax and brucellosis surveillance and implement One Health approach prevention and control

Current Position Data:
BSPB maintains the largest database of human anthrax cases ever compiled. Many of the diseases we work with are national notifiable diseases and we maintain these surveillance datasets which are also ready to use immediately.
Position Strengths: The strength of this position lies in the variety of pathogens investigated in our branch. The EIS officer assigned to this position will have opportunities to choose from field, hospital, environmental, food-borne and laboratory-based investigations. This position also offers ample opportunity for international work if desired.
Staff & Resources: BSPB Epidemiology Team is composed of three physicians, four veterinarians (one PhD in Ecology and two PhDs in Epidemiology), one geospatial modeler, and six master level epidemiologists. Three BSPB members are former EISOs, Ilana Schafer (EIS 2012), David Blaney (EIS 2006), and Kate Hendricks (EIS 1987). BSPB also has a former Preventive Effectiveness Fellow, Maria E. Negron (PE 2014).The team can provide modeling and statistical expertise. We work closely with the statistical team at division level.
Special Skills Useful for this Position: The majority of our pathogens are zoonoses, so an interest in a One Health approach to public health is desirable. Veterinarians and physicians are both a good fit for this position; however anyone with an infectious disease, epidemiology, or disease ecology background and interest in working with a wide range of infectious diseases will do well. English is not the first language in many of the countries we work in, so French or Spanish is desirable, but not required. Much of our work is international, so flexibility to travel internationally for up to four weeks is also desirable.
Domestic Travel: 10% **International Travel:** 30%

NCEZID-DHCPP-IDPB-Georgia-2019-01

Primary Supervisor: Sarah Reagan-Steiner, Medical Officer, Epidemiology and Operations Team Lead
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Secondary Supervisor(s):
- Jim Sejvar, Medical Officer, EIS 2002
- Wun-Ju Shieh, Deputy Branch Chief

Background: This position will be based jointly in the Infectious Diseases Pathology Branch (IDPB) and Prion and Public Health Office (PPHO) in CDC's Division of High-Consequence Pathogens and Pathology (DHCPP). DHCPP improves public health through investigating, monitoring, and controlling sickness, disability, and death caused by highly lethal viral, bacterial, prion diseases, and diseases of unknown origin. IDPB serves as a reference center for infectious disease pathology and tissue-based diagnostics on biopsy and autopsy specimens. IDPB also provides laboratory and epidemiologic assistance in the investigation of infectious diseases of unknown etiology, unexplained deaths, and outbreaks caused by a wide range of pathogens. IDPB has expertise in and

collaborates with public health agencies conducting medical examiner/coroner-based surveillance for infectious disease-related deaths. PPHO is responsible for conducting national surveillance for prion diseases including Creutzfeldt-Jakob disease (CJD) and for the investigation of neurologic illnesses, including encephalitis, meningitis, and acute flaccid paralysis including Guillain-Barre syndrome. PPHO's Neuroepidemiology Activity provides subject matter expertise for unexplained neurologic illnesses, neurologic adverse events following vaccination, and clinical expertise for various neurologic illnesses. IDPB and PPHO routinely collaborate in the investigation and tissue-based evaluation of cases and clusters of unexplained encephalitis and other neurologic syndromes.

Current Work: Recent projects included description of fatal chikungunya cases in Puerto Rico, investigation of Ebola virus disease in West Africa, an analysis of myocarditis hospitalizations, and an analysis of unexplained potentially infectious deaths in infants using US Linked Birth and Infant Death data set.

Proposed Initial Projects: Initial projects include the Prion Disease Surveillance and National Neurologic Disease Surveillance system evaluations, and the CSTE survey of state epidemiologists regarding medical examiner/coroner surveillance activities as described above. Data from the Nipah virus long-term survivors study in Bangladesh will be ready for the officer to begin epidemiologic analysis. The Brazil AFP surveillance investigation should just be commencing, allowing for the EISO's early involvement in overseeing this project.

Proposed Analytic Project:

Analysis of data collected from a survey of state epidemiologists to be conducted collaboratively with the Council of State and Territorial Epidemiologists (CSTE) regarding the status and importance of medical examiner/coroner-based surveillance activities within their jurisdiction; protocol development in progress.

Descriptive epidemiology and univariate and multivariate analysis of risk factors for adverse clinical outcomes following Nipah virus encephalitis, using a dataset of 45 survivors of Nipah virus encephalitis collected for over a decade in Bangladesh. Data entry and data cleanup have already been conducted; thus, this is a clean dataset that is ready for analysis, with little advance data cleaning required.

Descriptive epidemiology, univariate and multivariate analysis of clinical, epidemiologic and pathologic characteristics of fatal pediatric meningoencephalitis cases evaluated in IDPB from 2010-2018; protocol development in progress.

Descriptive epidemiology, univariate and multivariate analysis of clinical, epidemiologic and pathologic characteristics of fatal pneumonia cases evaluated in IDPB from 2010-2018; protocol development in progress.

Proposed Field Investigation Project:

Opportunity exists to collaborate with CSTE to conduct a survey on the importance of medical examiner-based infectious disease surveillance. PPHO supports EISOs participating in Epi-Aids and emergency response deployments. EIS Officers in the division also have opportunities to participate in field investigations related to any of the diseases handled in the division. A recent IDPB EISO completed this CAL through deployments to Sierra Leone as part of the Ebola Response. Prior EISOs from other branches have fulfilled their Field Investigation CAL in collaboration with PPHO by conducting original field investigation and data collection to determine the prevalence of Nodding Syndrome, a form of childhood unexplained epileptic encephalopathy primarily occurring in northern Uganda.

The officer will interact with state, local, and territorial health departments, medical examiners/coroners by providing technical assistance and/or as a part of epidemiologic and laboratory investigations of cases or clusters of unexplained illness or death where fixed tissue specimens are submitted to IDPB for evaluation.

The officer will have regular interaction with the National Prion Disease Pathology Surveillance Center (NPDPSC), the laboratory component of national prion disease surveillance, situated at Case Western Reserve University. The officer will conduct at least one visit to Cleveland to interact directly with Pathology Surveillance Center staff to coordinate integration of epidemiologic and clinical data to pathologic data. The officer will also interact

directly with state and local health departments by phone and by visitation to initiate national surveillance for neurologic diseases, namely Parkinson's Disease and Multiple Sclerosis. This is a new activity with the objective of initiating robust national surveillance for a number of different neurologic conditions. It is currently being initiated, so the EISO will likely be able to participate early on in the lifetime of the project. Finally, the officer will have the opportunity to stand up an Acute Flaccid Paralysis (AFP) surveillance system in Brazil to identify cases of Guillain-Barre syndrome, acute flaccid myelitis (AFM), polio, and other forms of acute flaccid paralysis (AFP). It is expected that the EISO will be starting right around the time that AFP surveillance in Brazil is being initiated. This activity could also fulfill the EISO's Field Investigation CAL.

Proposed Surveillance Project:

The officer would conduct two surveillance system evaluations within the scope of PPHO. The first would be an evaluation of National Prion Disease surveillance; the second would be an evaluation of National Neurologic Disease surveillance. Evaluation of Prion Disease surveillance will be conducted in collaboration with the National Prion Disease Pathology Surveillance Center. Creutzfeldt-Jakob Disease (CJD) cases as ascertained by National Death Index (NDI) data from the National Center for Health Statistics will be compared to the number of cases identified by the NPDPSC, allowing for an assessment of the relative strengths and weaknesses of each system. The second surveillance system evaluation will take place using the nascent National Neurologic Conditions Surveillance System (NNCSS). Cases of Parkinson's Disease and Multiple Sclerosis as ascertained by the surveillance system, through physician / health department reporting, National Death Index data, Health Alert messaging, large linked databases, and other data sources, will be compared to direct population -- based active surveillance in a particular health jurisdiction. This active surveillance will endeavor to identify every case of prevalent Parkinson's Disease and Multiple Sclerosis in the population -- based area, and allow for direct comparison with the NNCSS to determine the robustness of the surveillance system.

Current Position Data:

The IDPB database contains epidemiologic, clinical, and laboratory data for diagnostic cases received over 20 years in addition to limited data for more archival cases. Through collaborations within the DHCPP, access to NCHS Multiple Cause of Death Database is also available. The Nipah virus long-term outcomes database contains demographic, clinical, and epidemiologic data on 45 survivors of Nipah virus infection, housed in an Access database and ready for importation into an analytic software package for analysis.

Position Strengths: IDPB and PPHO are unique programs whose work focuses on unexplained illnesses and deaths, and complex or emerging clinical syndromes with unclear etiology. Both programs have a strong collaborative relationship with each other and with subject matter experts across CDC and outside the agency and frequently become involved in investigations into emerging and highly visible public health threats.

Staff & Resources: IDPB is a multidisciplinary branch that includes epidemiologists, pathologists, and molecular biologists. IDPB is the primary CDC unit responsible for investigating infectious diseases of unknown etiology and identification of emerging pathogens. Resources include expertise in epidemiology, molecular biology, and pathology. PPHO is responsible for investigation and surveillance of unexplained neurologic events, Guillain-Barre syndrome, Kawasaki disease, and prion diseases. PPHO's Neuroepidemiology activity includes an overseeing neurologist, as well as epidemiologists and statisticians. PPHO houses the division's Statistical Unit which can support EISOs. The unit has access to large administrative databases, including multiple-cause-of death data, for additional analysis depending on EISO's interest.

Special Skills Useful for this Position: It is important for the candidate to be able to work collaboratively, in a diverse, dynamic environment. The officer must also be able to communicate well orally and in writing. Familiarity with pathology and neurology can be useful.

Domestic Travel: 20% **International Travel:** 10%

NCEZID-DHCPP-PRB-Georgia-2019-01

Primary Supervisor: Agam Rao, Medical Officer and Unit Lead of Clinical Epidemiology Unit, Poxvirus and Rabies Branch, EIS 2009

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Secondary Supervisor(s):

- Ryan Wallace, Veterinary Officer and Unit Lead of Rabies Field Services Unit, EIS 2012

Background: The Poxvirus and Rabies Branch is dedicated to diverse issues related to smallpox, monkeypox, orf, vaccinia, molluscum contagiousum, rabies, and non-rabies lyssaviruses. Many outbreak investigations, epidemiologic research questions, and program implementations necessitate a One Health approach, involving human, animal, and environmental health sectors. Examples of these include the following: 1) ecological studies to identify rabies and monkeypox disease reservoirs (Vietnam and the Democratic Republic of the Congo) 2) Studies about serologic response to rabies vaccination and administration of rabies immunoglobulin that will inform the update to the Advisory Committee for Immunization Practices' national recommendations for human rabies, and 3) Emergency implementation of mass dog vaccination and investigation of human exposures during a rabies outbreak in Haiti and Dominican Republic.
The officer will participate in a broad range of domestic and international activities and will design and conduct epidemiologic studies; analyze data using basic and advanced statistical methods; acquire a deep understanding of rabies and poxviruses by responding to challenging public health inquiries; and learn to clearly communicate findings in abstracts, manuscripts and presentations. The officer will have the opportunity to work on projects about poxviruses and rabies in both domestic and international settings.

Current Work: -Rabies post-exposure prophylaxis surveillance (U.S)
-Mongoose-associated human rabies (Puerto Rico)*
-Integrated bite case management (Vietnam, Haiti)
-Evaluation of diagnostic testing for rabies (U.S.)
-Oral rabies vaccine surveillance (U.S)
-Myopericarditis cluster among smallpox vaccine recipients (U.S.)*
-Smallpox vaccine adverse event monitoring (DRC)
-Monkeypox outbreaks (Nigeria, ROC)*
-Zoonotic vaccinia virus (Colombia)*
*Epi-Aid

Proposed Initial Projects: - Analyzing human rabies database -- PRB maintains a database of rabies cases reported in the US (signs/symptoms and laboratory results).
- Analyzing dog population census data (Georgia, Guatemala, Haiti)
- Analyzing vaccination and surveillance data to identify causes of low coverage and persistent rabies cases (Haiti / India)
- Developing models to predict expenditure of human rabies vaccines under differing vaccine distribution scenarios.
- Analyzing temporal serologic response to rabies vaccination among persons with frequent rabies exposure
- Evaluation of healthcare facilities with regards to challenges and opportunities to improve supportive care needs of monkeypox patients, DRC

Proposed Analytic Project:
- Assessing rabies surveillance in a pilot electronic reporting system - Ethiopia.
- Evaluation of the introduction of eHealth tools to improve rabies investigation decision-making (Haiti / India): Over 2,000 rabies field investigations were conducted via tablets.
- Developing a global strategy for planning effective canine rabies vaccination campaigns: CDC has used an eHealth tool and data from Gates Foundation to develop risk-based prioritization algorithms. The method

was used in Haiti during the vaccination of >300,000 dogs. The EISO will develop methods to expand methodology to other countries.

- Assessing the clinical spectrum of rabies and, using modeling to determine clinical predictors for confirmed cases. The protocol will be developed by PRB staff and the EIS Officer will assist in its implementation.
- Modeling serologic response to rabies vaccination among persons with frequent rabies exposure; findings may inform ACIP recommendations for serologic monitoring. A protocol has been developed.
- Case-control study of persons who survived versus died from monkeypox to better understand risk factors for morbidity/mortality. A protocol is being drafted for DRC.
- Implementing and analyzing vaccine effectiveness and safety data for a smallpox vaccine study in healthcare workers at risk for monkeypox in DRC; ongoing project with flexibility to design analyses that address questions about effectiveness/immunogenicity.
- Descriptive study to identify illnesses often confused with rabies. The protocol will be developed by PRB staff in early 2019.
- Evaluating sufficiency of current standard-of-care treatment protocols for monkeypox in DRC.

Proposed Field Investigation Project:

The EIS Officer will have diverse opportunities to lead domestic and international outbreak investigations as well as established field projects in DRC, Haiti, India, Vietnam, Guatemala, Thailand, Nigeria, Ethiopia, Georgia, Kenya and Cambodia that involve primary data collection and fulfill the field investigation requirement. Opportunities for multiple field investigations are available in the Branch.

Examples:

- Implementation of eHealth tools to improve rabies surveillance - Vietnam: CDC supported development of canine rabies surveillance in Phu Tho. The system is paper-based. A new eHealth tool is proposed to be implemented and evaluated.
- Many Caribbean islands consider themselves rabies-free, despite no surveillance data to support this claim. The EISO will develop criteria to support a rabies-free status, with opportunities to participate in bat and mongoose sero-surveys.
- In 2019, an EISO led response efforts in Dominican Republic and Haiti to curb a rabies outbreak. The response saw >20,000 dogs vaccinated, >200 household surveys completed, and investigation of several hundred rabies suspected exposures.
- In 2018, several hundred visitors to a national park were exposed to a colony of bats. EISOs led an investigation to identify exposures and ensure appropriate medical care. Investigation results informed development of guidance for response to mass bat exposures.
- Monkeypox outbreak investigations and healthcare evaluations for patient care in west and central Africa
- Domestic investigations of novel poxvirus infections and potential zoonotic exposures; investigations of laboratory-acquired infections
- Investigation of an increase in vaccine adverse events in vaccines at a military base

A responsibility shared among EIS Officers and staff is phone duty, during which Officers perform clinical consultations with clinicians and health departments for suspected rabies and poxviruses and answer other public health inquires. During consultations, the Officer determines if testing by CDC is warranted and facilitates treatment with stockpiled biologics. Over 900 inquiries are logged each year, many of which lead to further investigations and field work.

EIS Officer projects commonly involve collaboration with state and local health departments. Established international partnerships often include collaborations with the Ministry of Health, Ministry of Agriculture, Ministry of Wildlife etc.

Examples:
USDA oversees an oral rabies vaccination program targeting raccoons. EIS Officers often assist with field activities to distribute vaccines via airplane/helicopter. Officers work with state partners to investigate unintentional human and domestic animal exposures to oral vaccines.

The Peruvian Ministry of Health requested assistance in the development of a standardized approach to dog population estimation, in the face of a multi-year rabies outbreak. An EISO would join a diverse team to develop this protocol and work with Peruvian partners on implementation.

A current EISO is leading a working group of partners from the Florida Department of Health, CDC, and USDA to investigate a potential outbreak of rabies in stray cats. The EISO is coordinating targeted sampling of animals suspected to have rabies, and phylogenetic analysis to understand transmission dynamics.

Three EISOs worked alongside DoD colleagues in an investigation of an increase in vaccine adverse events in vaccines at a military base, US

Proposed Surveillance Project:
These proposed projects will be conducted in Atlanta and could include phone-based discussion with state and local partners and in-person discussions with local stakeholders. Projects include evaluation of surveillance for 1) Laboratory exposures that resulted in poxvirus infections 2) prevalence of rabies in neurologic livestock (USDA collaboration), 3)Smallpox vaccine distribution and administration in the U.S., and 4) Serious adverse events and non-serious adverse events from the lyophilized Imvamune Smallpox vaccine used in the Democratic Republic of Congo.

- Evaluation of the introduction of an eHealth surveillance tool to improve real-time rabies investigation decision-making (Haiti and India): Since August 2018 over 2,000 rabies investigations have been conducted using an eHealth tool formatted for tablets in Haiti and India. The EIS Officer will develop a protocol based upon the surveillance system evaluation MMWR to identify gaps and novel methods for expanding implementation. This may include field evaluation, but could be conducted from headquarters with existing data.
- Laboratory-based surveillance for monkeypox at regional labs in DRC

Current Position Data:
Databases are immediately available for analysis and include database of human rabies clinical and diagnostic case information; adverse event data for an ongoing monkeypox vaccine project in DRC; monkeypox surveillance data, DRC; human and animal exposure to oral rabies vaccine bait surveillance data; poxvirus on-call databases; and large administrative databases such as national mortality and hospitalization datasets.
Examples:
- Rabies in animals is reportable to CDC, over 1 million observations, dating back to 1938 are available.
- PRB utilizes a mobile tool to track dog vaccinations. We have the world's largest repository for geo-coded data from a single country (Haiti)

Position Strengths: DHCPP has interdisciplinary working relationships with epidemiologists, clinicians, veterinarians, ecologists, biologists, microbiologists, virologists, and statisticians. Branch and division leadership are comprised of EIS alum and staff familiar with EIS training and actively seek out opportunities to enhance EIS Officers' experience. The Officer will be surrounded by a network of other Officers in NCEZID. Completion of all

EIS requirements early during training has been easy to accomplish and officers have been encouraged to pursue their own project interests in addition to those suggested by their supervisors.
Staff & Resources: Staff include EIS alum and interdisciplinary groups as mentioned previously. The branch and division offer support for statistical analyses (R, SAS, Epi-Info), GIS capabilities, database design and manipulation, diagnostic testing and interpretation, animal surveillance, molecular epidemiology and phylogenetics, and training in manuscript writing and media messaging. Strong administrative support at the Branch and Division level facilitate day-to-day activities essential to the Officer's productivity like travel to conferences and trainings. Branch and Division leadership view EIS Officers as a critical and important part of the team and enjoy mentoring and interacting with EIS Officers.
Special Skills Useful for this Position: The officer should have an interest in zoonotic diseases. Additionally, interests in clinical epidemiology, One Health, predictors of disease outcome, and development of clinical guidance to manage disease in animals and humans. Foreign language skills (French, Spanish) are helpful but not mandatory for international projects. Prior experience with Microsoft Access, SAS or R, and GIS may enable the officer to build on these skills and tackle more complex analyses but are not required as officers will learn the needed skills on-the-job.
Domestic Travel: 5% **International Travel:** 20%

NCEZID-DHCPP-VSP-Georgia-2019-01

Primary Supervisor: Mary Choi, Medical Officer, EIS 2012

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Secondary Supervisor(s):

- Trevor Shoemaker, Epidemiologist
- Beth Ervin, Epidemiologist

Background: The Division of High Consequence Pathogens and Pathology (DHCPP) aims to prevent illness and death caused by many viral, bacterial, and prion diseases of high consequence (i.e. highly lethal, potential for epidemics, few treatments or vaccines) in the United States and throughout the world.

Viral Special Pathogens Branch (VSPB) is a national and international reference center for zoonotic viral hemorrhagic fevers (VHF), with emphasis on those caused by arenaviruses (Lassa fever, Lujo virus, Lymphocytic Choriomeningitis virus/LCMV, and the South American hemorrhagic fevers); bunyaviruses (Crimean-Congo hemorrhagic fever, Hantavirus pulmonary syndrome, Rift Valley fever); tick-borne flaviviruses (Central European and Far-Eastern tick-borne encephalitis, Kyasanur Forest disease, Alkhurma virus, and Omsk hemorrhagic fever); and filoviruses (Marburg and Ebola hemorrhagic fevers); and unknown agents responsible for VHF-like diseases. The EIS officer in this position will focus on high-hazard viral disease epidemiology and will participate in epidemiologic field responses and studies, provide consultation on the clinical and epidemiologic management of suspected cases and/or epidemics of these diseases to clinicians in the U.S. and abroad, develop educational materials on the detection, prevention and control of these highly hazardous viral disease, and interface with colleagues in international and domestic settings.

Current Work: Developed study protocol, coordinated sample collection, and processed PBMCs from EVD survivors in Liberia to evaluate risk factors for Ebola persistence in semen; assessed VHF surveillance system in Uganda; led a multi-state investigation following an imported case of Andes virus; developed educational materials on Lassa fever, Nipah, and Hantavirus.
Proposed Initial Projects: EVD outbreak response in DRC, Uganda, or Rwanda; Indian Health Service hantavirus medical records abstraction (protocol has been drafted as is awaiting IRB approval); Liberia Ebola virus serosurvey at the Firestone plantation (protocol has been drafted, project is scheduled to start fall 2019);

development of educational materials on CCHF, Rift Valley Fever, and other pathogens; additional projects are likely to be developed as interests and needs arise.

Proposed Analytic Project:

Potential analytic projects include: in-depth, real-time analysis of data collected from the 2018 EVD outbreak in North Kivu to support the DRC Ministry of Health manage the outbreak response, Indian Health Service hantavirus medical records abstraction (protocol has been drafted as is awaiting IRB approval); Liberia Ebola virus serosurvey at the Firestone plantation (protocol has been drafted, project is scheduled to start fall 2019). Additional projects are likely to be developed as interests and needs arise.

Proposed Field Investigation Project:

Potential opportunities include: VHF outbreak response (foreign and domestic), to include the current EVD outbreak in North Kivu; Liberia EVD serosurvey at Firestone Plantation. In addition, our branch is supportive of our EISOs participating in Epi-Aids and emergency response deployments. All previous EIS officers have been able to fulfill the field investigation CAL through opportunities within our branch (West Africa EVD outbreak, Marburg outbreak, domestic outbreaks: Seoul virus, Andes virus).

EISO will interact with public health partners through outbreak field investigations, both domestic and international. Outside of outbreak/field investigations, EISO will have the opportunity to interact with public health partners in the course of clinical consultations for suspected cases of BSL-4 pathogens.

Proposed Surveillance Project:

EISO will be able to evaluate one of VSPBs ongoing international surveillance activities. One activity is ongoing prospective enhanced zoonotic surveillance of Crimean-Congo hemorrhagic fever and Rift Valley fever in animal and human populations in Uganda. Another is ongoing surveillance of South American hemorrhagic fevers and Hantaviruses in Columbia. Both involve field-based evaluation of site selection, case identification, data collection methods and program implementation. Secondary data analysis will include determining incidence rates, epidemiological and clinical risk factor analysis, sensitivity of case definitions, and general descriptive statistics.

Current Position Data:

Sierra Leone Ebola Death Database (compilation of databases related to the 2014 Ebola outbreak in Sierra Leone to include a database of alerts received, safe and dignified burials, laboratory reports, and data collected by Ebola Treatment Units) , datasets from previous viral hemorrhagic fever outbreaks, Hantavirus Pulmonary Syndrome reported cases in the United States, data collected from Liberia's national semen testing program,

Position Strengths: EIS officers have been involved in high-profile investigations, including the West Africa Ebola epidemic, Hantavirus Pulmonary Syndrome (HPS) in Yosemite National Park, multistate LCMV outbreaks in the U.S., Nipah virus outbreaks in Malaysia and Bangladesh, Rift Valley fever outbreaks in Saudi Arabia, Uganda, and Kenya, multi-state outbreak of Seoul Virus in the U.S., and Marburg and Ebola outbreaks in Angola, Uganda, and DRC. EIS officers are involved in case patient interviews, environmental investigations, data analysis, and new project development. VSPB also provides subject matter expertise regarding imported suspected cases of VHF and bioterrorism response planning.

Staff & Resources: Statistical, data management, graphic design, and geographical information system support.

Special Skills Useful for this Position: Interest in zoonotic viral infections.

Domestic Travel: 10% **International Travel:** 20%

NCEZID-DHQP-ERIB-Georgia-2019-01

Primary Supervisor: Nora Chea, Medical Epidemiologist, EIS 2013

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Secondary Supervisor(s):

- Nicola Thompson, Epidemiologist, Team Lead, EIS 2006

- Francisca Abanyie-Bimbo, Medical Officer, EIS 2012

Background: The mission of the Division of Healthcare Quality Promotion (DHQP) is to promote patient and healthcare worker safety across healthcare settings. Key activities include:

- Detecting and containing new and emerging drug-resistant infections.
- Investigating outbreaks and adverse events in healthcare facilities, including healthcare-associated infections (HAIs); adverse drug events; blood, organ, and tissue safety; and vaccine safety.
- Managing the National Healthcare Safety Network (NHSN), the national surveillance system for monitoring and preventing HAIs.
- Promoting appropriate use of antibiotics.
- Playing a critical role in public health emergencies (e.g., Ebola, Middle East Respiratory Syndrome [MERS]).

The Epidemiology Research and Innovations Branch (ERIB) develops innovative projects and analytic strategies to address knowledge gaps critical to the prevention of HAIs and other adverse events. ERIB's Office of Prevention Research and Evaluation leads the division's analytic work in designing and conducting case-control, cohort, and mathematical modeling studies. The Office of Surveillance and Epidemiology leads population-based surveillance for CDIs, invasive methicillin-resistant and methicillin-susceptible Staphylococcus aureus (MRSA/MSSA) infections, and drug-resistant gram-negative bacterial infections; special studies to identify modifiable risk factors and populations at risk; periodic prevalence surveys of HAIs and antimicrobial use; and projects to advance the science of HAI and antimicrobial use surveillance.

Current Work: Determining demographic and socioeconomic factors associated with community-associated Clostridioides difficile infections (CDIs); Estimating attributable mortality of mediastinitis among coronary artery bypass graft surgery patients; and investigating multiple outbreaks including undetermined risk factors for bacterial and fungal infections among people who inject drugs in New York, 2018.

Proposed Initial Projects: 1) Describe factors associated with increased prevalence of HAIs in a large cohort of nursing homes

2) Evaluation of whether rates of specific events within National Healthcare Safety Network (NHSN) Ventilator-Associated Event (VAE) surveillance can be proxy measures of the quality of antimicrobial prescribing in critical care locations

3) Determine relationship between community antibiotic use and community-associated MRSA prevalence

4) Compare epidemiology of ESBL-producing and carbapenem-resistant Enterobacteriaceae

Proposed Analytic Project:

Officers will work closely with epidemiologists, statisticians, and mathematical modelers from PRB, ERIB, CEMB, and other groups within DHQP to conduct analyses that address infection prevention, healthcare epidemiology, molecular epidemiology, and antimicrobial resistance. These data sources allow officers to move beyond descriptive epidemiology and explore analytic epidemiology techniques. Experts in advanced analytic techniques such as mathematical modeling are available to assist officers. Opportunities in the DHQP/PRB and DHQP/ERIB positions will be available to all the officers in these positions. Please refer to the two positions in DHQP-PRB for additional projects that will be available for this position.

- Analysis of factors associated with increased prevalence of HAIs in a large cohort of nursing homes
- Evaluation of whether rates of specific events within National Healthcare Safety Network (NHSN) Ventilator-Associated Event (VAE) surveillance can be proxy measures of the quality of antimicrobial prescribing in critical care locations
- Determine relationship between community antibiotic use and community-associated MRSA prevalence
- Compare epidemiology of extended-spectrum beta-lactamase (ESBL)-producing and carbapenem-resistant Enterobacteriaceae

Proposed Field Investigation Project:

EIS officers have numerous opportunities to lead or participate in outbreak investigations in a variety of healthcare settings. Investigations typically involve 1--2 weeks in the field and include many activities that

generate primary data, such as staff and patient interviews, medical chart reviews, environmental assessments, and infection control observations. Officers design case-control studies, develop data systems, conduct data analyses, present findings, provide recommendations, and follow up with healthcare facilities and relevant partners (e.g., state or local health departments, international organizations, or ministries of health) to track improvement. Officers work closely with laboratory experts to perform on-site environmental sampling to support epidemiologic analyses. Field investigations typically lead to presentation and/or publication. Examples of recent DHQP domestic investigations fulfilling the Field Investigation CAL:

- Undetermined risk factors for bacterial and fungal infections among people who inject drugs"”New York, 2018
- Undetermined risk factors for colonization with Candida auris"”New York, 2018.
- Undetermined source of carbapenamase-producing carbapenem-resistant Pseudomonas aeuroginosa among multiple healthcare facilities"”Texas, 2018
- Investigation of multiple clusters of toxic anterior segment syndrome in outpatient surgery centers"”Washington, 2018
- Undetermined burden of healthcare-associated infections in the patient population treated at Indian Health Service Hospital"”Great Plains Area 2017--2018
- Undetermined source and risk factors for rash illness and respiratory symptoms among healthcare personnel at a Veterans Affairs acute care facility"”West Virginia, 2017--2018
- Undetermined risk factors for contaminated organ transplant preservation solution"”Iowa, 2016
- Undetermined mode of transmission, risk factors, and mitigation measures for Pseudomonas infections among NICU patients"”Maryland, 2016

Officers work closely with groups across the division, serving as expert consultants from headquarters or through deployment to provide on-site expertise, working closely with state and local health departments and healthcare facilities and clinicians with support and guidance from nationally-recognized experts. Officers also work with other federal agencies (e.g., the Food and Drug Administration, Indian Health Service), professional societies, and non-profit organizations (e.g., World Health Organization). Opportunities for international field experiences through DHQP's International Infection Control Program will be made available as they arise, and officers may also have opportunities to collaborate with international NGOs and ministries of health in initial planning, data collection in healthcare settings, data analyses, and formulation of recommendations.

Officers rotate as the on-call duty officer, serving as a rapid, centralized point of contact for local and state health departments investigating potential HAI outbreaks and infection control breaches to request CDC assistance. Officers lead the management and response for these requests, coordinating DHQP's (and often CDC's) efforts. This includes managing information from a multidisciplinary team of CDC staff, including medical officers, epidemiologists, laboratorians, and infection preventionists. Officers are involved with the implementation of recommendations (e.g., training healthcare personnel on standard and transmission-based precautions) and the follow-up with partners to monitor progress. Officers have played critical roles in the response to the recent Ebola virus outbreaks in Africa. Officers serve as subject matter experts and provide technical guidance and advice to implementing partners with appropriate support of project leads.

Proposed Surveillance Project:

Officers will have the opportunity to evaluate any of the following public health surveillance systems or others:

1) Population-based surveillance system for CDIs
2) Population-based surveillance system for invasive MRSA and MSSA
3) Population-based surveillance system for ESBL-producing organisms
4) Pediatric Ventilator-Associated Event (VAE) surveillance

Current Position Data:

- National Healthcare Safety Network: HAI and antimicrobial resistance data reported by~25,000 healthcare facilities which includes diverse healthcare settings such as acute care hospitals, dialysis centers, and long term care facilities

- Emerging Infections Program: surveillance data collected by a network of state health departments and academic partners to investigate emerging HAI threats, advanced infection tracking methods, and antibiotic resistance in the United States
- CDC Antibiotic Resistance Laboratory Network: Data collected through a CDC initiative to coordinate national surveillance for multi-drug-resistant organisms, which includes labs in 50 states, 5 cities, and Puerto Rico
- Healthcare administrative databases

Position Strengths: This position offers strong, interdisciplinary training including collaborations with state and local public health partners and connections to clinical medicine and academia. Officers lead outbreak investigations, gain technical expertise in healthcare-associated infections, and acquire skills in public health surveillance evaluation, descriptive analysis, and multivariable and mathematical modeling. Officers have gone on to positions in state and federal public health institutions, academia, clinical medicine, and industry.

A two-week orientation covers epidemiologic methods, data management, and laboratory techniques and environmental sampling. Biweekly seminars enrich the breadth of prevention topics. Weekly seminars provide additional opportunities to discuss ongoing projects and analytic approaches.

Staff & Resources: Officers work closely with epidemiologists and statisticians focusing on measuring and reporting healthcare-associated events and developing novel surveillance tools to address emerging issues involving infection control, healthcare epidemiology, and antimicrobial use and resistance. DHQP staff are diverse with an assortment of skills, expertise and backgrounds including clinical medicine, epidemiologic methods, surveillance, data management, infection prevention, outbreak response, policy, and behavioral science.

Special Skills Useful for this Position: Open to new experiences; willingness to learn and adapt to a diversity of topics and settings; excellent communication skills; team player who is also capable of independent work. Officers with a wide range of educational backgrounds and prior work experience have been very successful in DHQP and contributed to the diversity of knowledge within the division.

Domestic Travel: 20% **International Travel:** 5%

NCEZID-DHQP-ISO-Georgia-2019-01

Primary Supervisor: John Su, Medical Officer, EIS 2006

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Secondary Supervisor(s):

- Maria Cano, Medical Officer, EIS 1999
- Tom Shimabukuro, Deputy Director, EIS 2004

Background: The mission of CDC's Immunization Safety Office (ISO) is to monitor and assess the safety of vaccines administered to children, adolescents and adults. ISO's comprehensive approach to post-licensure vaccine safety monitoring includes active and passive surveillance to detect possible increased risk for adverse events (AEs) following vaccination and conducting focused research studies. The three main surveillance systems in ISO are: 1) the Vaccine Adverse Event Reporting System (VAERS), a large spontaneous (or passive) surveillance system that serves as the nation's front-line, early warning, vaccine safety monitoring system. and can detect rare AEs that may not have been detected during pre-licensure clinical trials; 2) the Vaccine Safety Datalink (VSD), a collaboration between ISO and 8 large integrated health care organizations, which incorporates health records in large-linked databases for >10 million covered individuals and is used to perform active surveillance for vaccine safety and to conduct epidemiologic research studies to assess associations between vaccines and potential AEs and quantify risk; 3) the Clinical Immunization Safety Assessment (CISA) Project: A collaboration between ISO and 7 academic medical research centers that conducts clinical studies of vaccine safety and

individual-level case reviews, including causality assessment, for persons who experienced AEs following immunization.
Current Work: Self-controlled case series analysis of risk of shoulder bursitis after inactivated influenza vaccines; descriptive epidemiology of adverse events reported after novel adjuvanted herpes zoster vaccine, and of shoulder injury related to vaccine administration reported to the Vaccine Injury Compensation Program.
Proposed Initial Projects: Within the first month of assignment (i.e., end of August 2019), the EISO can begin their surveillance evaluation. With advanced communication (e.g., after the Match), preliminary work on analytic projects could also begin, including the following:

- Self-controlled case series analyses of acute demyelinating encephalomyelitis after adolescent vaccines (e.g., HPV), AEs after varicella vaccine in children who are on chronic aspirin therapy, and AEs after multiple concurrent (vs singly administered) vaccines.
- Comparative risk analyses, including risk of graft rejection or Central Sensitivity Syndromes (e.g., chronic fatigue syndrome, fibromyalgia) after vaccination, and AEs after vaccination among persons with mitochondrial disorders.

Proposed Analytic Project:
VAERS lends itself to descriptive analysis, which provides ample opportunity to learn about hypothesis-driven analyses, cleaning, coding, and analyzing data, as well as drafting a manuscript as first author, and presenting at conferences. Being often the earliest and the most sensitive means of identifying potential safety concerns, this type of descriptive review of VAERS data often leads to more in-depth analytic projects in other databases. One example is a descriptive review of Shoulder Injury Related to Vaccine Administration: a similar such review at a sister agency led to a self-controlled case series analysis examining the risk of shoulder bursitis after inactivated influenza vaccines using VSD data. Other analytic projects for an incoming EISO might include the following: 1) self-controlled case series analyses of a variety of topics, including acute demyelinating encephalomyelitis after adolescent vaccines (e.g., HPV), AEs after varicella vaccine in children who are on chronic aspirin therapy, and AEs after receipt of multiple, concurrent (vs singly administered) vaccines; 2) comparative risk analyses, including risk of graft rejection after recommended vaccines, Central Sensitivity Syndromes (e.g., chronic fatigue syndrome, fibromyalgia) after vaccination, and AEs after vaccination among persons with mitochondrial disorders. These projects follow established protocols and methodologies: the time that an EISO would spend developing analytic approaches and protocols is expected to be minimal.

Please note that while examples are provided, EISOs are encouraged to develop their own hypotheses and analyses based on their interests and aptitudes.

Proposed Field Investigation Project:
Interest in vaccine safety has grown in recent years, leading to increasing opportunities to lead and participate in field investigations compared to past years. Typically, such Epi-Aids involve review of medical records and the basics of field epidemiology (e.g., line lists, the basic interrogatives of who, what, where, when); interviews with case patients, frequent communications and providing updates with other partners to stakeholders, and drafting reports of investigation findings. ISO's current EISO led an Epi-Aid where she collected and analyzed data, spent 2 weeks in the field, worked with multiple stakeholders, and offered recommendations based upon her analyses of the data. She was the CDC vaccine safety subject matter expert on a joint DoD/CDC Epi-Aid that investigated myopericarditis after smallpox vaccination
Also, ISO is situated within the Division of Healthcare Quality Promotion (DHQP), which has significant activity in field investigations ensuring all EISOs are afforded opportunity to participate in field investigations. In addition, ISO works closely with the National Center for Immunization and Respiratory Diseases, Immunization Services Division, which is another potential source for field investigations.

The Advisory Committee on Immunization Practices (ACIP) meets periodically throughout the year, and sets national policy regarding vaccination. Data on vaccine safety are provided to ACIP and are critical for optimizing these vaccination recommendations. EISOs can participate in collaborative projects with other federal agencies:

past examples include the Health Resources and Services Administration, reviewing Shoulder Injury Related to Vaccine Administration following receipt of inactivated influenza vaccines and ways to prevent vaccine administration errors, and field investigation with Department of Defense collaborators to evaluate a cluster of myopericarditis cases following smallpox vaccination in service personnel. Opportunities for the EISO to collaborate with the Food and Drug Administration on VAERS projects are also available because VAERS is co-managed by FDA and ISO.

Proposed Surveillance Project:

A number of potential opportunities for a surveillance evaluation exist within ISO, such as:

- Evaluation of the reports submitted to VAERS to determine the quality of the reports by the type of reporter (e.g., patient or parent, vaccine provider, vaccine manufacturer) and completeness of the data fields with the reports

- Site visit to the contractor for VAERS data to learn the process of the surveillance system, i.e., from the time reports are received, coded using the international medical terminology dictionary for vaccine adverse events, and data entry. The end result of these efforts is anticipated to be a body of data that will require secondary (desk-based) analysis, the results of which can then be presented (i.e., during Fall Course).

Current Position Data:

To date, VAERS has over 620,000 reports of AEs after vaccination, offering a rich environment in which to explore and develop hypotheses. VSD averages 10 million covered members annually, and has access to medical records; because denominator data are readily available, VSD data are amenable to risk estimates. Additionally, ISO can access MarketScan data, allowing for analyses using "big data".

Position Strengths: ISO offers experience in vaccine safety monitoring available nowhere else (specifically, at the national level), including access to vaccinologists with combined decades of expertise. Response to public inquiries affords a unique opportunity to explore multiple aspects of vaccines, from AEs to basic science to public perception. Statisticians are available to assist with data analysis.

Staff & Resources: Several EIS alumni serve within ISO, including all EISO supervisors. A robust data management team facilitating data retrieval and queries, data manipulation and IT support for computing needs resides within the ISO. Administrative staff are available to streamline arrangements for travel (e.g., conferences, public health responses). Coworkers come from diverse backgrounds, including nursing, public health, statistics, and varied specialty fields of medicine. As ISO is located off the Roybal campus, parking is adjacent to the building and readily available, a CDC Lifestyle Center is within walking distance (Building 1825, Century Center), and multiple amenities are minutes away.

Special Skills Useful for this Position: Strong interpersonal skills are greatly desired, as is a desire to learn. Familiarity with medical and public health terminology and strong written and verbal communication skills are also desirable. While not required, a medical background (e.g., MT, RN, MD) would be helpful. Also useful would be previous experience with epidemiologic study design, data analysis, SAS programming skills (or a desire to learn them), and some proficiency with Microsoft Office Suite (e.g., Word, Excel) and perhaps EpiInfo.

Domestic Travel: 5% **International Travel:** 0%

NCEZID-DHQP-PRB-Georgia-2019-01

Primary Supervisor: Shannon Novosad, Medical Officer, EIS 2015

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Secondary Supervisor(s):

- Alison Laufer Halpin, Team Lead, EIS 2011

- Allison Brown, Team Lead, EIS 2010

Background: The mission of the Division of Healthcare Quality Promotion (DHQP) is to promote patient safety and healthcare personnel safety across healthcare settings. Key activities include:

- Detecting and containing new and emerging drug-resistant infections.
- Investigating outbreaks and adverse events in healthcare facilities, including healthcare-associated infections (HAIs); adverse drug events; blood, organ, and other tissue safety; and vaccine safety. Managing the National Healthcare Safety Network (NHSN), the national surveillance system for monitoring and preventing HAIs
- Promoting appropriate use of antibiotics
- Playing a critical role in public health emergencies (e.g., Ebola, Middle East Respiratory Syndrome [MERS]).

DHQP's Prevention and Response Branch (PRB) is offering 2 EIS positions in collaboration with DHQP's Clinical and Environmental Microbiology Branch (CEMB). PRB strives to improve the safety and quality of healthcare by investigating outbreaks of HAIs and antimicrobial-resistant pathogens. PRB designs and implements best practices for preventing HAIs and transmission of resistant organisms, measures the impact of HAI prevention efforts, and promotes antimicrobial stewardship. PRB maintains a strong connection to clinical medicine and laboratory science, and works closely with regulatory agencies. CEMB provides expertise that allows the integration of laboratory and epidemiologic data to assist in HAI outbreaks and address emergent antimicrobial resistance.

Current Work: PRB officers led or participated in multiple investigations, including determining the source of Burkholderia infections in lung transplant patients, estimating the burden of bacterial and fungal infections among injection opioid users, and employing regional containment of carbapenemase-producing Pseudomonas. Officers conducted analyses involving healthcare-associated infections (HAIs), antimicrobial-resistant pathogens, and antimicrobial use.

Proposed Initial Projects: Possible projects with immediately available data include:

- Describing variability in the use of contact precautions and isolation strategies among persons with MDRO-positive cultures
- Identify geographic determinants (environmental factors) associated with increased incidence of community-associated CDIs by conducting spatial analysis using ArcGIS
- Modeling environmental factors to predict persistence of pathogens in the healthcare setting
- Assess opportunities for diagnostic stewardship for hospitalized patients with CDIs

Proposed Analytic Project:

Officers will work closely with epidemiologists, statisticians, and mathematical modelers from PRB, ERIB, CEMB, and other groups within DHQP to conduct analyses that address infection prevention, healthcare epidemiology, molecular epidemiology, and antimicrobial resistance. These data sources allow officers to move beyond descriptive epidemiology and explore analytic epidemiology techniques. Experts in advanced analytic techniques such as mathematical modeling are available to assist officers. Opportunities in the DHQP/PRB and DHQP/ERIB positions will be available to all the officers in these positions. Please refer to the other position in DHQP-PRB and the position in DHQP-ERIB for additional projects that will be available for this position.

- Identifying geographic determinants (environmental factors) associated with increased incidence of community-associated Clostridium difficile infection (CDI) by conducting spatial analysis using programs like ArcGIS.
- Describing variability in the use of contact precautions and isolation strategies among persons with multi-drug-resistant organism (MDRO) positive cultures
- Assessing opportunities for diagnostic stewardship for C. difficile among hospitalized inpatients

- Modeling environmental factors to predict persistence of pathogens in the healthcare setting

Proposed Field Investigation Project:
EIS officers have numerous opportunities to lead or participate in outbreak investigations in a variety of healthcare settings. Investigations typically involve 1-2 weeks in the field and include activities that generate primary data, such as staff and patient interviews, medical chart reviews, environmental assessments, and infection control observations. Officers can expect to design and perform epidemiologic studies, conduct data analyses, present findings, provide recommendations, and follow up with healthcare facilities and partners (e.g., state or local health departments, international organizations, or ministries of health) to track improvement. Officers work closely with laboratory experts to perform on-site environmental sampling to support epidemiologic analyses. Field investigations typically lead to presentation and/or publication. Examples of recent DHQP domestic investigations fulfilling the Field Investigation CAL:

- Undetermined risk factors for bacterial and fungal infections among people who inject drugs"”New York, 2018
- Undetermined risk factors for colonization with Candida auris"”New York, 2018
- Undetermined source of carbapenamase-producing carbapenem-resistant Pseudomonas aeuroginosa among multiple healthcare facilities"”Texas, 2018
- Investigation of multiple clusters of toxic anterior segment syndrome in outpatient surgery centers"”Washington, 2018
- Undetermined burden of healthcare-associated infections in the patient population treated at Indian Health Service Hospital"”Great Plains Area 2017--2018
- Undetermined source and risk factors for rash illness and respiratory symptoms among healthcare personnel at a Veterans Affairs acute care facility"”West Virginia, 2017--2018
- Undetermined risk factors for contaminated organ transplant preservation solution"”Iowa, 2016
- Undetermined mode of transmission, risk factors, and mitigation measures for Pseudomonas infections among NICU patients"”Maryland, 2016

Officers rotate as the on-call duty officer, serving as a rapid, centralized point of contact for local and state health departments investigating potential HAI outbreaks and infection control breaches to request CDC assistance. Officers lead the management and response for these requests, coordinating CDC's efforts. This includes managing information from a multidisciplinary team of CDC staff, including medical officers, epidemiologists, laboratorians, and infection preventionists. With support and guidance from nationally recognized subject matter experts, officers serve as expert consultants from headquarters or through deployment to provide on-site expertise, working closely with state and local health departments and clinicians. Officers are involved with the implementation of recommendations (e.g., training healthcare personnel on standard and transmission-based precautions) and the follow-up with partners to monitor progress.

Officers also work with other federal agencies (e.g., the Food and Drug Administration, Indian Health Service), professional societies, and non-profit organizations (e.g., World Health Organization). Opportunities for international field experiences through DHQP's International Infection Control Program will be made available as they arise, and officers may also have opportunities to collaborate with international NGOs and ministries of health in initial planning, data collection in healthcare settings, data analyses, and formulation of recommendations.

Proposed Surveillance Project:
Officers will have the opportunity to choose from surveillance projects related to HAIs, antimicrobial resistance, and antimicrobial stewardship. These projects will involve review of the literature for the disease under surveillance, interviews with surveillance staff (CDC-based and field staff), summarizing results (written reports and presentations), and presentation of results to appropriate partners including surveillance site staff.

Proposed surveillance projects include:

- Determine the likelihood of repeated patient-specific healthcare-associated infections among acute care, long-term care and inpatient rehabilitation hospitals
- Investigate differential antibiotic susceptibility among select organisms reported to NHSN
- Evaluate pediatric ventilator-associated event (VAE) surveillance

Current Position Data:
Multiple sources of HAI data are available including:

- National Healthcare Safety Network (NHSN): HAI and antimicrobial resistance data reported by ~25,000 healthcare facilities including acute care hospitals, dialysis centers, and long-term care facilities
- Emerging Infections Program (EIP): surveillance data collected by a network of state health departments and academic partners to investigate emerging HAI threats, advanced infection tracking methods, and antibiotic resistance
- CDC Antibiotic Resistance Laboratory Network (ARLN): data collected through a CDC initiative to coordinate national surveillance for multi-drug-resistant organisms, includes labs in 50 states, 5 cities, and Puerto Rico
- Healthcare administrative databases

Position Strengths: This position offers strong, interdisciplinary training including collaborations with state and local public health partners and connections to clinical medicine and academia. Officers lead outbreak investigations, gain technical expertise in healthcare-associated infections, and acquire skills in public health surveillance evaluation, and multivariable and mathematical modeling. Officers have gone on to positions in state and federal public health institutions, academia, clinical medicine, and industry.
Staff & Resources: The DHQP orientation for incoming officers covers epidemiologic methods, data management, and media training. Hands-on training in laboratory techniques and environmental sampling is also provided. Biweekly seminars provided by subject matter experts enrich the officer's understanding of HAI prevention topics. Weekly work-in-progress seminars provide additional opportunities to discuss ongoing projects and analytic approaches with the entire division.
Statistical expertise and support from DHQP staff is readily available. DHQP staff are diverse with an assortment of skills, expertise and backgrounds including clinical medicine, epidemiologic methods, surveillance, data management, infection prevention, outbreak response, policy, and behavioral science.

Special Skills Useful for this Position: Open to new experiences; willingness to learn and adapt to a diversity of topics and settings; excellent communication skills; team player who is also capable of independent work. Officers with a wide range of educational backgrounds and prior work experience have been very successful in DHQP and contributed to the diversity of knowledge within the division.
Domestic Travel: 20% **International Travel:** 5%

NCEZID-DHQP-PRB-Georgia-2019-02

Primary Supervisor: Matthew Crist, Medical Officer

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Secondary Supervisor(s):

- Snigdha Vallabhaneni, Medical Officer, EIS 2013

Background: The mission of the Division of Healthcare Quality Promotion (DHQP) is to promote patient safety and healthcare personnel safety across healthcare settings. Key activities include:

- Detecting and containing new and emerging drug-resistant infections
- Investigating outbreak and adverse events in healthcare facilities, including healthcare-associated infection (HAIs); adverse drug events, blood, organ, and other tissue safety; and vaccine safety. Managing the National Healthcare Safety Network (NHSN), the national surveillance system for monitoring and preventing HAIs
- Promoting appropriate use of antibiotics
- Playing a critical role in public health emergencies (e.g., Ebola, Middle East Respiratory Syndrome [MERS])

DHQP's Prevention and Response Branch (PRB) is offering 2 EIS positions in collaboration with DHQP's Clinical and Environmental Microbiology Branch (CEMB). PRB strives to improve the safety and quality of healthcare by investigating outbreaks of HAIs and antimicrobial-resistant pathogens. PRB designs and implements best practices for preventing HAIs and transmission of resistant organisms, measures the impact of HAI prevention efforts, and promotes antimicrobial stewardship. PRB maintains a strong connection to clinical medicine and laboratory science, and works closely with regulatory agencies. CEMB provides expertise that allows the integration of laboratory and epidemiologic data to assist in HAI outbreaks and address emergent antimicrobial resistance.

Current Work: PRB officers led or participated in multiple investigations, including determining the source of Burkholderia infections in lung transplant patients, estimating the burden of bacterial and fungal infections among injection opioid users, and employing regional containment of carbapenemase-producing Pseudomonas. Officers conducted analyses involving healthcare-associated infections, antimicrobial-resistant pathogens, and antimicrobial use.

Proposed Initial Projects: Possible projects with immediately available data include:

(1) Defining and implementing cut-offs for identification of transmission events during Pseudomonas aeruginosa outbreaks
(2) Describe clinical outcomes of persons receiving fecal microbiota transplants for CDIs
(3) Layering analyses of whole genome sequencing, antimicrobial susceptibility, epidemiology, and clinical data to describe carbapenem-resistant Pseudomonas aeruginosa
(4) Leveraging whole genome sequencing to describe the molecular epidemiology of Vancomycin-resistant Enterococcus in the United States

Proposed Analytic Project:
Officers will work closely with epidemiologists, statisticians, and mathematical modelers from PRB, ERIB, CEMB, and other groups within DHQP to conduct analyses that address infection prevention, healthcare epidemiology, molecular epidemiology, and antimicrobial resistance. These data sources allow officers to move beyond descriptive epidemiology and explore analytic epidemiology techniques. Experts in advanced analytic techniques such as mathematical modeling are available to assist officers. Opportunities in the DHQP/PRB and DHQP/ERIB positions will be available to all the officers in these positions. Please refer to the other position in DHQP-PRB and the position in DHQP-ERIB for additional projects that will be available for this position.

- An analytic approach to outbreaks: Definition and implementation of cut-offs for identifying transmission events during Pseudomonas aeruginosa outbreaks
- Molecular epidemiology of carbapenem-resistant Pseudomonas aeruginosa in the US: Layering and analyses of whole genome sequencing, antimicrobial susceptibility, epidemiology, and clinical data
- A Broad View: Leveraging whole genome sequencing to describe the molecular epidemiology of Vancomycin-resistant Enterococcus in the United States

- Describing clinical outcomes of persons receiving fecal microbiota transplants (FMT)

Proposed Field Investigation Project:
EIS officers have numerous opportunities to lead or participate in outbreak investigations in a variety of healthcare settings. Investigations typically involve 1-2 weeks in the field and include activities that generate primary data, such as staff and patient interviews, medical chart reviews, environmental assessments, and infection control observations. Officers can expect to design and perform epidemiologic studies, conduct data analyses, present findings, provide recommendations, and follow up with healthcare facilities and partners (e.g., state or local health departments, international organizations, or ministries of health) to track improvement. Officers work closely with laboratory experts to perform on-site environmental sampling to support epidemiologic analyses. Field investigations typically lead to presentation and/or publication. Examples of recent DHQP domestic investigations fulfilling the Field Investigation CAL:

- Undetermined risk factors for bacterial and fungal infections among people who inject drugs"”New York, 2018
- Undetermined risk factors for colonization with Candida auris"”New York, 2018
- Undetermined source of carbapenamase-producing carbapenem-resistant Pseudomonas aeuroginosa among multiple healthcare facilities"”Texas, 2018
- Investigation of multiple clusters of toxic anterior segment syndrome in outpatient surgery centers"”Washington, 2018
- Undetermined burden of healthcare-associated infections in the patient population treated at Indian Health Service Hospital"”Great Plains Area 2017--2018
- Undetermined source and risk factors for rash illness and respiratory symptoms among healthcare personnel at a Veterans Affairs acute care facility"”West Virginia, 2017--2018
- Undetermined risk factors for contaminated organ transplant preservation solution"”Iowa, 2016
- Undetermined mode of transmission, risk factors, and mitigation measures for Pseudomonas infections among NICU patients"”Maryland, 2016

Officers rotate as the on-call duty officer, serving as a rapid, centralized point of contact for local and state health departments investigating potential HAI outbreaks and infection control breaches to request CDC assistance. Officers lead the management and response for these requests, coordinating CDC's efforts. This includes managing information from a multidisciplinary team of CDC staff, including medical officers, epidemiologists, laboratorians, and infection preventionists. With support and guidance from nationally recognized subject matter experts, officers serve as expert consultants from headquarters or through deployment to provide on-site expertise, working closely with state and local health departments and clinicians. Officers are involved with the implementation of recommendations (e.g., training healthcare personnel on standard and transmission-based precautions) and the follow-up with partners to monitor progress.

Officers also work with other federal agencies (e.g., the Food and Drug Administration, Indian Health Service), professional societies, and non-profit organizations (e.g., World Health Organization). Opportunities for international field experiences through DHQP's International Infection Control Program will be made available as they arise, and officers may also have opportunities to collaborate with international NGOs and ministries of health in initial planning, data collection in healthcare settings, data analyses, and formulation of recommendations.

Proposed Surveillance Project:
Officers will have the opportunity to choose from surveillance projects related to HAIs, antimicrobial resistance, and antimicrobial stewardship. These projects will involve review of the literature for the disease under surveillance, interviews with surveillance staff (CDC-based and field staff), summarizing results (written reports and presentations), and presentation of results to appropriate partners including surveillance site staff.

Proposed surveillance projects include:

- Conduct state-based healthcare-associated infection trend analyses
- Assess the fit for LabID event reporting as a proxy for healthcare-associated infections for both methicillin-resistant Staphylococcus aureus (MRSA) bloodstream infections and Clostridium difficile infection in locations in which both types of reporting were in plan
- Use the NHSN database to determine similarities and differences in antibiotic resistance across healthcare facility types

Current Position Data:

Multiple sources of HAI data are available including:

- National Healthcare Safety Network (NHSN): HAI and antimicrobial resistance data reported by ~25,000 healthcare facilities including acute care hospitals, dialysis centers, and long-term care facilities
- Emerging Infections Program (EIP): surveillance data collected by a network of state health departments and academic partners to investigate emerging HAI threats, advanced infection tracking methods, and antibiotic resistance
- CDC Antibiotic Resistance Laboratory Network (ARLN): data collected through a CDC initiative to coordinate national surveillance for multi-drug-resistant organisms, includes labs in 50 states, 5 cities, and Puerto Rico
- Healthcare administrative databases

Position Strengths: This position offers strong, interdisciplinary training including collaborations with state and local public health partners and connections to clinical medicine and academia. Officers lead outbreak investigations, gain technical expertise in healthcare-associated infections, and acquire skills in public health surveillance evaluation, and multivariable and mathematical modeling. Officers have gone on to positions in state and federal public health institutions, academia, clinical medicine, and industry.

Staff & Resources: The DHQP orientation for incoming officers covers epidemiologic methods, data management, and media training. Hands-on training in laboratory techniques and environmental sampling is also provided. Biweekly seminars provided by subject matter experts enrich the officer's understanding of HAI prevention topics. Weekly work-in-progress seminars provide additional opportunities to discuss ongoing projects and analytic approaches with the entire division.

Statistical expertise and support from DHQP staff is readily available. DHQP staff are diverse with an assortment of skills, expertise and backgrounds including clinical medicine, epidemiologic methods, surveillance, data management, infection prevention, outbreak response, policy, and behavioral science.

Special Skills Useful for this Position: Open to new experiences; willingness to learn and adapt to a diversity of topics and settings; excellent communication skills; team player who is also capable of independent work. Officers with a wide range of educational backgrounds and prior work experience have been very successful in DHQP and contributed to the diversity of knowledge within the division.

Domestic Travel: 20% **International Travel:** 5%

NCEZID-DHQP-OD-Georgia-2019-01

Primary Supervisor: Amber Vasquez, Physician (Public Health), EIS 2015

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Secondary Supervisor(s):

- Aditya Sharma, Physician (Public Health), EIS 2013

Background: The mission of the Division of Healthcare Quality Promotion (DHQP) is to promote patient and healthcare worker safety across healthcare settings. Key activities include:

- Detecting and containing new and emerging drug-resistant infections.
- Investigating outbreaks and adverse events in healthcare facilities, including healthcare-associated infections (HAIs); adverse drug events; blood, organ, and tissue safety; and vaccine safety.
- Managing the National Healthcare Safety Network (NHSN), the national surveillance system for monitoring and preventing HAIs.
- Promoting appropriate use of antibiotics.

The International Infection Control Program (IICP) was established within DHQP to address three main categories of HAI in international settings: 1) infections with outbreak potential (e.g., Middle East Respiratory Syndrome [MERS], Ebola); 2) device-associated and surgical site infections; and 3) antimicrobial resistance (AMR). IICP collaborates with domestic and international partners to conduct outbreak investigations, implement and evaluate HAI and AMR surveillance, conduct research on healthcare epidemiology and AMR, monitor and evaluate the implementation of infection prevention and control (IPC) programs, and develop and promote antimicrobial stewardship efforts. The IICP EIS officer will work on international programs, research projects, and international outbreaks, and will also participate in or lead domestic healthcare outbreaks under supervision of DHQP's Prevention and Response Branch.

Current Work: IICP EISOs have worked on various global programs, including establishing surveillance for antimicrobial resistance in Thailand and Ethiopia, evaluating healthcare-associated infection surveillance systems in Senegal and Georgia, and investigating international outbreaks (e.g., neonatal sepsis in South Africa, hepatitis C in Mongolia, and Ebola in the Democratic Republic of the Congo).
Proposed Initial Projects: The following projects are available to begin immediately upon assignment:

1. AMR surveillance evaluation in Kenya or Vietnam
2. Concordance analysis of HAI surveillance case definitions in India
3. Assessment of adherence to best practices and cost-effectiveness analysis of an environmental toolkit in South Africa
4. Analysis of antibiotic use data from a population-based infectious disease surveillance survey in Kenya

Proposed Analytic Project:
International analytic projects available to an incoming EIS officer include:

1. Kenya -- analysis of antibiotic use data from a population-based infectious disease surveillance survey performed bi-weekly from 2008 to 2014. Analysis would include multivariate and logistic regression modeling to identify and describe patient characteristics that lead to increased likelihood of unregulated antibiotic use.
2. India -- evaluate the performance of a 28-hospital HAI surveillance system's case definitions and its ability to detect HAIs in comparison with U.S. case definitions. The project would involve descriptive and concordance analysis.
3. South Africa or Kenya -- evaluate the impact of implementing an IICP-designed environmental toolkit in a handful of pilot facilities through a cost-effectiveness analysis.
4. Thailand -- frequency analysis and logistic regression modeling of national antibiotic prescribing data to guide improved antibiotic use.

Each of these projects have protocols in development and would be available at the time of or shortly after the EIS officer's matriculation. A myriad of domestic analytic projects are also available if the IICP officer were interested.

Proposed Field Investigation Project:
IICP EIS officers will have abundant opportunities to fulfill the Field Investigation CAL and perform primary data collection in the field. As described above, the analytic project in India comparing the India HAI surveillance definitions with U.S. case definitions would require travel to several participating sites for chart review.

Evaluation of an environmental toolkit in South Africa or Kenya would include interviews and site assessments to determine adherence to best practices at pilot facilities.

IICP would prioritize the EIS officer's involvement in international outbreaks as they arise and is supportive of involvement in agency-wide emergency response deployments. The IICP officer will also participate in one or more domestic Epi-Aids under the auspices of the Prevention and Response Branch.
IICP collaborates with Ministries of Health, the World Health Organization, and non-governmental partners in 18 countries. Examples include on-site and remote technical assistance to implementation partners (e.g., PATH, American Society for Microbiology, Oxford University Clinical Research Unit) in multiple countries, Pan American Health Organization in Latin America, and academic universities (e.g., the Ohio State University, Johns Hopkins University) in Ethiopia, India, and South Africa. Technical assistance typically involves training of healthcare or ministry staff in-country, hospital infection control assessments, surveillance evaluation, program planning, project development, and assistance with data collection and analysis for a variety of healthcare-related programs.

Recent public health partner collaborations by IICP EISOs include on-site technical assistance provided to the Infection Control Africa Network and the Bill and Melinda Gates Foundation in Johannesburg, South Africa, for a neonatal sepsis prevention project. IICP EISOs have also deployed to Uganda to assist the Ministry of Health and World Health Organization in Ebola preparedness due to the ongoing Ebola outbreak in neighboring Democratic Republic of the Congo. IICP EIS officers have opportunities to interact with local and state departments of health and other U.S. federal agencies (e.g., Food and Drug Administration) during domestic on-site outbreak response and from CDC headquarters as the HAI outbreak duty officer.
Proposed Surveillance Project:
Several surveillance evaluations are available to an incoming IICP EIS officer. In Kenya, the EISO would conduct an evaluation of the AMR surveillance system in model healthcare facilities that refer their data and specimens to a national reference laboratory. In Vietnam, the EISO would conduct an evaluation of the 16-laboratory AMR surveillance network, which utilizes WHONET software to report monthly AMR data to the Ministry of Health. This evaluation would include an external validation check to assess data completeness and accuracy. Evaluations would require international travel to complete hands-on evaluation of surveillance practices, gain stakeholder feedback, and review data at one or more participating sites.
Current Position Data:
Datasets available through our international collaborations include HAI and AMR surveillance data from Vietnam, India, Thailand, and Georgia; large data sets of antimicrobial use are available in Thailand and Kenya. Through IICP's collaboration with domestic branches of DHQP, the officer would also have access to HAI, AMR and antimicrobial use surveillance data from the National Healthcare Safety Network (NHSN); Clostridiodes difficile, MRSA, drug-resistant gram-negative bacteria, and HAI prevalence data through the Emerging Infections Program; and various administrative datasets for inpatient and outpatient healthcare settings.
Position Strengths: IICP is an interdisciplinary group working at the forefront of public health issues. A deep staff roster and large breadth of subject matter allows the IICP experience to be tailored to the EISO's interests. Officers have the opportunity to balance both international and domestic activities as well as programmatic work and outbreak response. Staff have strong analytic, writing, and presentation skills and promote the same in their officers. This interdisciplinary training opportunity expands officers' career opportunities, and former DHQP officers have gone on to positions in state and federal public health, academia, clinical medicine, and industry.
Staff & Resources: An IICP officer would benefit from experienced staff, including EIS-trained public health physicians, nurses, and PhD scientists. Additional subject matter expertise within IICP include microbiologists, infection preventionists, and environmental engineers. IICP also benefits from close collaboration with subject matter experts throughout the division. Statistical support is readily available through the surveillance and epidemiology research branches of DHQP. Officer orientation encompasses epidemiologic methods, data management, media training, and some hands-on training in laboratory techniques. Weekly seminars provide

additional opportunities for in-depth discussion covering a wide-range of healthcare subject matter, behavioral science, and analytic approaches.
Special Skills Useful for this Position: IICP seeks intellectually curious, highly motivated, and flexible officers who are able to work both independently and closely within a team. Prior international experience in low and middle-income countries would be a plus, but is not required. Due to our international work, fluency in another language, especially French or Spanish, would be useful but is not required.
Domestic Travel: 5% **International Travel:** 30%

NCEZID-DVBD-ADB-Colorado-2019-01

Primary Supervisor: Susan Hills, Medical Epidemiologist

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Secondary Supervisor(s):

- Carolyn Gould, Medical officer
- Stacey Martin, Epidemiologist

Background: Arboviral Diseases Branch is located in Fort Collins, Colorado and works on viruses that are transmitted to humans by infected mosquitoes, ticks, and other arthropod vectors. Different vectors, animal hosts, and tissue tropisms contribute to variations in distribution, disease incidence, and clinical manifestations. West Nile virus is the leading domestic cause of arboviral disease. However, other arboviruses cause sporadic cases and outbreaks, including Colorado tick fever, eastern equine encephalitis, La Crosse, and Powassan viruses. Chikungunya, Japanese encephalitis, yellow fever, and Zika viruses are important causes of disease internationally. New or emerging arboviruses include Cache Valley, Heartland, and Bourbon viruses.

The EISO's primary responsibility will be to participate in surveillance, research, and outbreak investigations of domestic, international, and travel-related arboviral diseases. The EISO will serve as the epidemiologist on a multidisciplinary team that may include entomologists, biologists, laboratory scientists, statisticians, and health education specialists.

Arboviral Diseases Branch is in the Division of Vector-Borne Diseases. There will likely be opportunities to collaborate with other branches in the Division, including Bacterial Diseases Branch in Fort Collins, Dengue Branch in Puerto Rico, and Rickettsial Diseases Branch in Atlanta. Although the branch is located in Colorado, the position is not considered a field position.

Current Work: 1. Enhanced arboviral disease surveillance, American Samoa
2. Colorado tick fever investigation, Oregon
3. Heartland/Bourbon virus infection in tickborne disease patients
4. Cost-effectiveness of West Nile virus vaccine in elderly populations
5. St. Louis encephalitis virus epidemiology
6. Chikungunya vaccine acceptability, USVI
7. First transplant-associated eastern equine encephalitis virus infections

Proposed Initial Projects: 1. In addition to assessing surveillance for La Crosse virus (LACV) disease cases in the United States, the EISO will conduct a broader review of the changing epidemiology of LACV disease. The officer will review ArboNET data to describe disease epidemiology and draft a manuscript for publication. This activity will provide experience in the important skills of database management, interpretation of epidemiologic data, and writing.
2. Investigate accuracy and utility of reporting of asymptomatic Zika virus infections among pregnant women in the United States.

3. Evaluate diagnostic testing and reporting practices for Colorado tick fever virus disease cases.

Proposed Analytic Project:

1. Conduct a clinical evaluation and validation of the Zika virus microsphere immunoassay for diagnosis of Zika virus infection; sensitivity, specificity and positive predictive value will be determined using traditional techniques and possibly composite reference standards and latent class analysis (LCA) modeling.
2. Design a representative survey to assess regional seroprevalence of Jamestown Canyon virus infection using blood bank samples. Conduct the analysis using methods appropriate for the selected survey design.
3. Evaluate diagnostic testing and reporting practices for Colorado tick fever virus disease (CTF) cases using data on cases reported to state health departments and by conducting an analysis using an administrative database, to better understand CTF epidemiology and help determine whether CTF should be nationally notifiable.
4. Design and implement a study to investigate performance and utility of dried blood spots for detecting chikungunya and Zika virus RNA, and if applicable, conduct field testing in a Pacific Island nation.
5. Summarize the epidemiology of La Crosse virus disease cases reported to ArboNET.
6. Investigate trends, accuracy, and utility of reporting of asymptomatic Zika virus infections among pregnant women in the United States to inform testing recommendations and possible Zika virus case definition changes.
7. Investigate feasibility of a study to evaluate non-inferiority of a fractional versus full dose of the U.S-produced yellow fever vaccine.

Proposed Field Investigation Project:

Typically, there are ample opportunities for field investigations for EISOs, both within and across branches. At least one domestic or international arboviral disease field investigation will be undertaken. Future outbreaks and investigations cannot be predicted, but recent investigations include Colorado tick fever in Oregon, plague in Madagascar (cross-branch collaboration), arboviral disease surveillance in American Samoa, Bourbon virus infection in Missouri, Zika virus in Federated States of Micronesia, and microcephaly due to Zika virus in Brazil. We support EISOs participating in Epi-Aids and other emergency response deployments.

ADB maintains close ties with multiple external partners, such as state and local health departments, universities, and international organizations, affording many opportunities for collaborative projects and investigations. EISOs interact on a regular basis with state and local health department staff to provide technical assistance on diagnosis and reporting of arboviral diseases, and during specific investigations such as possible arboviral transplant or transfusion events. EISOs have also conducted collaborative projects with state health departments such as investigating local hotspots of West Nile virus disease burden and developing a protocol to evaluate the incidence of Heartland and Bourbon virus in a region. Most of the EISOs in this position respond to at least one Epi-Aid request for assistance from a state or local health department. In recent international investigations and projects, EISOs have had the opportunity to work directly with national and local Ministry of Health staff. In larger responses such a recent EISO deployment to Madagascar for a plague response, interaction with World Health Organization, UNICEF, nongovernment organizations, and other international organizations would occur.

Proposed Surveillance Project:

Evaluate surveillance for La Crosse virus disease in US states, using data from the national arboviral disease surveillance system, ArboNET, and arboviral disease laboratory database, ADBDiag. Interaction with a selection of state vector-borne disease coordinators and other staff, such as database managers, will be required to gain an understanding of system features including usefulness, flexibility, and acceptability.

Current Position Data:

ArboNET: National arbovirus surveillance system that captures information on human disease cases, veterinary cases, and infections in sentinel animals, dead birds, and mosquitoes;
ADBDiag: Database of arboviral diagnostic testing performed at CDC.

These databases are accessible and readily available for analytic projects.

Position Strengths: Diversity: Wide variety of project types and pathogens, including viruses with domestic and international relevance.

Strong supervision: Maximum of two EISOs to six senior epidemiologists.
Location: Center-level CDC-experience with the recreational and lifestyle advantages of Colorado.

Staff & Resources: CDC Fort Collins has >200 personnel, including epidemiologists, microbiologists, statisticians, and IT support. The Arboviral Diseases Branch Epidemiology Team has 10 staff, including six senior epidemiologists, two surveillance officers, and two EISOs. We have video conferencing with Atlanta for EIS events and other training.
Special Skills Useful for this Position: Enthusiasm to learn and adapt to a variety of topics and settings; willingness to accept challenges and opportunities; good communication skills; team player who is also capable of independent work. We will work with you to develop skills you do not have while drawing upon your current skills. Our team has successfully worked with EISOs with differing backgrounds and expertise.
Domestic Travel: 15% **International Travel:** 10%

NCEZID-DVBD-DB-Puerto Rico-2019-01

Primary Supervisor: Laura Adams, Epidemiologist, EIS 2012

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Secondary Supervisor(s):

- Gabriela Paz-Bailey, Team Lead, EIS 2000
- Tyler Sharp, Health Scientist, EIS 2010

Background: Dengue is the world's most common mosquito-transmitted viral disease, and is endemic throughout the tropics where an estimated 390 million infections occur annually. CDC Dengue Branch's mission is to reduce morbidity and mortality due to dengue in the US and worldwide, and support disease surveillance and prevention activities for chikungunya and Zika viruses in Puerto Rico and the U.S. Virgin Islands. Although much of the Branch work is focused in the Caribbean, project opportunities in the US and globally are common.

Dengue Branch has ~90 employees and is composed of five teams: Epidemiology, Laboratory, Entomology, Communications, and Administration. The EISO will be assigned to the Epidemiology Team; however, cross training with all teams will occur. Prominent activities of the EpiTeam include: 1) The Communities Organized to Prevent Arboviruses (COPA) project, an ongoing prospective cohort study of the seroincidence of dengue, chikungunya, and Zika virus infection in PR, which is being used to evaluate novel approaches to vector control; 2) The Sentinel Enhanced Dengue Surveillance System (SEDSS), which conducts surveillance for acute febrile illness at three clinical sites in Puerto Rico and tests for 16 different pathogens; and 3) Outbreak investigations in Puerto Rico, American Samoa, Jamaica, and other countries.

Current Work: Investigation of a dengue outbreak in American Samoa; Zika and Guillain-Barre syndrome case-control studies; establishing dengue surveillance (Burkina Faso); dengue outbreak investigations (Fiji/Kenya/Tanzania/Haiti/Florida/Texas/Arizona); fatal dengue, chikungunya and leptospirosis in Puerto Rico; evaluation of surveillance system during the Zika epidemic in Puerto Rico; chikungunya serosurvey in regions with ongoing mosquito interventions.
Proposed Initial Projects: Use Google data to assess population level mobility and compare it with COPA interview data among community members.
Lead a collaboration with a vaccine developer to analyze a phase 3 multi-national prospective cohort to describe severe dengue epidemiology.
Establish a consortium of international dengue cohort studies to conduct an aggregate analyses on generalizable risk factors for severe dengue.

Collaborate with the SEDSS study team to conduct a prospective evaluation of the dengue rapid diagnostic tests in the SEDSS site (to be initiated during the next dengue epidemic).

Proposed Analytic Project:
Conduct analyses of data from a large vaccine trial (more than 30,000 participants) to evaluate factors associated with hospitalization and severe dengue. Conduct multivariate analyses to identify risk factors for infection and development of severe disease among patients recruited through SEDSS. Conduct geospatial analyses to identify hotspots for arboviral disease, and correlate findings with mosquito surveillance data. Analyze Google data to assess population level mobility and compare it with COPA interview data among community members. Conduct an aggregate analysis to combine data from multiple international dengue cohort studies and identify risk factors for severe dengue.
Proposed Field Investigation Project:
Multiple opportunities will be available to fulfill the field investigation CAL. Dengue outbreak investigations, both in Puerto Rico and internationally, occur regularly and offer opportunities to lead field investigations in diverse settings. Additionally, COPA and SEDSS are both ongoing initiatives involving data collection in southern Puerto Rico, and could be modified to fit an EIS officer's project needs, including answering new analysis questions, responding to outbreak needs, or evaluating new rapid diagnostic tests.
Dengue Branch works closely with Puerto Rico Department of Health on a routine basis, providing the EISO an opportunity to gain both "Center" and "State" based experiences. The Branch's major projects (i.e., COPA, SEDSS) are dependent on cooperative agreements with academic and clinical partners in Puerto Rico, and the EISO will gain experience in effectively maintaining and growing these partnerships. Interaction with state, territorial, and international health authorities occurs both during remote consultations (i.e., phone, email) as well as during field investigations.
Proposed Surveillance Project:
Dengue Branch receives data from three large arboviral surveillance systems, and an updated, detailed evaluation of any of them would provide valuable and actionable information to improve surveillance. The COPA cohort study, which performs surveillance for arboviruses in multiple communities in southern Puerto Rico, was implemented in 2018 and has not yet received a systematic evaluation. SEDSS is a clinic-based acute febrile illness surveillance program, and ArboNET is the national arboviral surveillance system where dengue cases are reported. All three evaluations would necessitate interviews with stakeholders at CDC and Puerto Rico Dept of Health, as well as with hospital partners.
Current Position Data:
Dengue Branch houses multiple data sources available for analysis by EISOs. This includes the Passive Dengue Surveillance System (>40 years of data); Sentinel Enhanced Dengue Surveillance System (7 years); ArboNET (10 years); COPA cohort data; and outbreak and serosurvey databases.
Position Strengths: This position offers a combination of exciting outbreak investigations, short and long-term research studies, high-profile investigations of high-impact illnesses, and access to robust arboviral surveillance systems, with work in Puerto Rico and abroad. EISOs work closely with the Puerto Rico Department of Health and gain strong mentoring from recognized international experts in dengue. This position will provide the benefits of working on the cutting edge of Zika and dengue investigations, while enjoying beautiful rain forests and tropical beaches.
Staff & Resources: Molecular epidemiology and immuno-diagnostic laboratories are available on site, as well as experts in mosquito surveillance and control. Additional resources are also available within the branch and division for biostatistics, modeling, database management, data entry, and administrative/logistical support.
Special Skills Useful for this Position: Interest in vector-borne disease epidemiology/ecology and international health is required. Background in epidemiology, immunology, or virology is desired. Spanish language competency is strongly recommended.
Domestic Travel: 10% **International Travel:** 10%

NCEZID-DVBD-BDB-Colorado-2019-01

Primary Supervisor: Kiersten Kugeler, Epidemiologist
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Secondary Supervisor(s):
- Grace Marx, Medical Officer, EIS 2016
- Christina Nelson, Medical Officer

Background: This position is based in the Bacterial Diseases Branch (BDB), one of four branches within CDC's Division of Vector-Borne Diseases (DVBD). The overarching goals of the Division are to identify vector-borne pathogens that cause human illness, better understand where, when, and how people are exposed to these pathogens, and in turn, prevent exposure and minimize consequences of infection. Although located in Fort Collins, Colorado, the position is considered in-house, i.e., an "Atlanta" position, and not a field position.

BDB is responsible for surveillance, control, and prevention of plague, tularemia, Lyme disease, tick-borne relapsing fever, and cat-scratch disease. These diseases constitute a particularly diverse set of vector-borne and zoonotic infections that pose unique public health challenges. Lyme disease is among the most common of all nationally notifiable conditions in the United States. Plague and tularemia are uncommon but life-threatening diseases caused by Tier 1 biological threat agents, and plague still poses a threat in many under-resourced areas of the world. Officers will work domestically and internationally to gain a broad understanding of vector-borne diseases and public health practice, and they will interact daily with an enthusiastic and supportive team of physicians, epidemiologists, microbiologists, entomologists, and ecologists.

Current Work: Tickborne relapsing fever among occupational cavers""Austin, Texas, 2017
Qualitative assessment of 2017 Lyme disease surveillance case definition change
Antimicrobial treatment patterns among US plague cases
Animal contact among US plague cases
Data management and analysis from Ugandan acute febrile illness study
Risk factors for human-tick encounters in northeastern US

Proposed Initial Projects: In addition to a surveillance project (assessment of alternative data source for Lyme disease surveillance), we'd suggest starting with a straightforward project such as a case series of unusual clinical manifestations of Francisella and/or Yersinia infections; both would be valuable additions to the literature. While these are suggestions for the first month, we are flexible and want to work with an officer to identify projects that reflect their expertise at the outset as well as their interests. We'd fully support field opportunities early in the assignment; field investigations in Uganda, if desired, would realistically begin late September at the earliest.

Proposed Analytic Project:

This position supports both descriptive and analytic epidemiologic projects, and there is substantial expertise within the team to support complex analyses. Some specific analytic projects for which data are available include:

- Assessment of antimicrobial prescription patterns associated with Lyme disease diagnoses in a large insurance claims-based dataset (MarketScan). This could include multivariable regression analysis to understand factors such as geography or patient age that may be linked to differences in prescribed duration of therapy.
- Longitudinal analysis of the association between frequency of tick bites and changes in self-reported prevention practices. This project includes analysis of survey data from a long-term intervention trial. Does having a tick bite lead to improved prevention practices?
- Analysis of factors associated with self-reported support for tick-borne disease prevention options. This project includes multivariable analysis of survey data to identify factors associated with willingness to pay more or less for certain potential interventions, such as repellents, or chemical acaricide application to yards.

- GIS-based analysis of continued geographic spread of human Lyme disease. This is a follow up analysis to that documented in Kugeler et al, "Geographic distribution and expansion of human Lyme disease"”United States" (https://wwwnc.cdc.gov/eid/article/21/8/14-1878_article) which covered 4 five-year time periods through 2012 to document if regions with high incidence of Lyme disease are continuing to expand.

Proposed Field Investigation Project:
This position supports opportunities for original data collection through long-standing collaborative work in northwestern Uganda to combat plague through 1) active surveillance and intervention, 2) clinical training, 3) public education, and 4) research into improved diagnostics. In addition to data collection associated with planned and ongoing projects, opportunities abound for independently conceived "spin-off" projects.

This position supports EISO participation in Epi-Aids and response deployments. Recent EISO Epi-Aids and deployments include: relapsing fever among occupational cavers in Austin, tularemia among National Park workers in WY, increasing Lyme disease laboratory reports in Arkansas, and numerous Ebola and Zika virus disease response deployments. Additional field opportunities such as tick collections and case investigations have occurred outside of official "deployment" channels.

Field investigation opportunities for this position will also be supported by other branches in DVBD as possible, including the Arboviral Diseases Branch, co-located in Fort Collins and the Rickettsial Zoonoses Branch, in Atlanta. Recent examples of field investigations from these branches include Colorado tick fever in Oregon, arboviral disease surveillance in American Samoa, Bourbon virus infection in Missouri, and Rocky Mountain Spotted Fever on Native American lands in Arizona.

DVBD's Bacterial Diseases Branch (BDB) maintains extensive external collaborations with state public health, university, and international partners. The BDB Epidemiology and Surveillance Team serves as the primary point of contact for inquiries from clinicians and public health partners regarding case investigations, prophylaxis, diagnosis, testing, and prevention for Lyme disease, plague, tularemia, and relapsing fever. The EISO typically takes a lead role in all facets of these core activities. Robust relationships with state-based public health partners allow opportunity for site visits, field investigations, and collaborative scientific publications, as desired and appropriate.

The BDB team is actively involved in relevant vector-borne surveillance, education, and response activities at state health departments funded through CDC's Epidemiology and Laboratory Capacity (ELC) cooperative agreement. Additionally, the team oversees the TickNET research collaboration with four state/university programs through CDC's Emerging Infections Program (EIP), an applied research platform to improve methods for surveillance and prevention of Lyme and other tickborne diseases. The BDB team provides ongoing technical expertise to the university-based Vector-borne Diseases Centers of Excellence (CoE). There are numerous opportunities to serve in a coordinating or consultant role in ongoing or new activities through any of these partnerships. Current efforts include planning community intervention trials, surveys, and a multi-center effort to examine prescribing practices for Lyme disease through electronic medical records.

Lastly, the officer will have the opportunity to interact with CDC-Uganda and the Uganda Virus Research Institute on ongoing efforts to improve capacity to diagnose and prevent plague in Uganda.

Proposed Surveillance Project:
Lyme disease poses a number of unique public health surveillance challenges. This team has been involved in multiple efforts to innovate Lyme disease surveillance, and these efforts are ramping up in 2019. These reflect efforts to improve traditional passive surveillance as well as examine novel ways to assess disease burden and

the variety and frequency of organisms causing illness. Use of multiple data sources balances gaps and provides a more complete public health picture of Lyme disease in the US. Evaluation of individual and collective Lyme disease surveillance improvements is a priority for this team in the near term. Specific potential projects include:

- Analytic comparisons of insurance claims data to passive surveillance data. Analysis would include comparison of demographics, clinical manifestations, and geography.
- Quantitative comparison of laboratory-based surveillance to traditional passive surveillance in states with high-incidence of Lyme disease
- Evaluation of molecular surveillance
- Evaluation and validation of National Syndromic Surveillance Program algorithms for Lyme disease or tick bites in emergency departments. Analysis would include evaluation of predictive values in syndromic surveillance algorithms and would inform optimal application of syndromic surveillance as a complementary surveillance system for Lyme disease.

Current Position Data:

National surveillance datasets for three nationally-notifiable conditions, plague, tularemia, and Lyme disease (~300,000 records)
TickNET datasets including geo-located intervention trial involving >2700 households, survey of national laboratories, prospective intervention trial
Tularemia case report form data with clinical and exposure information
Detailed clinical and epidemiological data on human plague cases in the United States (1900-2018)
MarketScan-detailed medical claims searchable by ICD9 and ICD10 code for ~38 million Americans
Syndromic surveillance data for emergency department visits associated with tick bites
Ongoing Advanced Molecular Detection (AMD) projects including demographic, clinical, geographic, and laboratory findings""collaborative work with branch diagnostic lab and state health partners

Position Strengths: This position is unique for its close collaboration with a multidisciplinary team of in-house epidemiologists, physicians, microbiologists, entomologists, and ecologists. This is a CDC position located in Colorado, with opportunity to work at state, national, and international levels on very diverse public health issues. Beautiful Fort Collins, Colorado, has been repeatedly named one of America's best places to live and visit. The college town 1 hour north of Denver is home to Colorado State University and to diverse eateries, microbreweries, innumerable outdoor recreational opportunities, and a vibrant local music scene.

Staff & Resources: Epidemiology team comprised of 6 FTEs and several fellows with diverse expertise, including extensive skills in SAS, R, JMP, ArcGIS, Epi Info
Statistical support from 2 doctorate-level statisticians
Administrative support for travel
Computer/IT support staff on site

Special Skills Useful for this Position: - Strong work ethic

- A "self-starter" attitude
- Strong organizational skills
- Good interpersonal skills
- Scientific writing experience
- A sense of humor!

Domestic Travel: 10% **International Travel:** 10%

NCEZID-DVBD-RZB-Georgia-2019-01

Primary Supervisor: Cara Cherry, Veterinary Epidemiologist, EIS 2014

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Secondary Supervisor(s):

- Amy Peterson, Team Lead, EIS 2010
- Paige Armstrong, Medical Officer, EIS 2015

Background: The Rickettsial Zoonoses Branch (RZB) is in the Division of Vector-Borne Diseases and is located in Atlanta, GA. RZB provides surveillance, field investigation, and laboratory support for epidemiologic and ecologic investigations of Rocky Mountain spotted fever (RMSF) and other spotted fever group rickettsia (SFGR), ehrlichiosis, anaplasmosis, Q fever, and typhus fevers, both domestically and internationally. The mission of the Division of Vector-borne Diseases is to reduce illness and death due to vector-borne diseases. Our vision is to create a future where vector-borne diseases no longer threaten public health.

Current Work: Interventions in Sonora, Mexico to control RMSF in a high incidence community; Data analysis of Q fever endocarditis cases reported to CDC; Canine RMSF serosurvey along US-Mexico border; Investigations of fatal RMSF case on tribal lands; Field investigations of multiple Q fever outbreaks; Update clinical guidance on tickborne rickettsial diseases.

Proposed Initial Projects: In the first month of the program, the EISO will begin work on the surveillance evaluation and analytic project. The EISO will also complete trainings and medical clearances to be eligible to assist in the fall Rocky Mountain Spotted Fever Collaring Campaigns where she or he will be able to provide direct assistance in collecting data on numbers of dogs, tick burden on the dogs, presence of existing collars, and also to directly provide education to clinical providers and to community members. The EISO will also become familiar with available data sources for the proposed analytic project.

Proposed Analytic Project:

A variety of data are available for analytic projects. RZB has access to several healthcare encounter databases, including IBM MarketScan, the Indian Health Service National Patient Information Reporting System, the Healthcare Cost and Utilization Project (HCUP) and Department of Veterans' Affairs databases. The EISO can conduct patient-based analysis on inpatient and outpatient visit records coded with an International Classification of Diseases, 9th or 10th revision, Clinical Modification (ICD-9-CM; ICD-10-CM) code for a rickettsial disease. These data are de-identified and analysis using these data is considered non-research and can begin when the EISO arrives. The EISO will assist in project design and creation of an analysis plan.

Proposed Field Investigation Project:

Several rickettsial pathogens (Coxiella burnetii, Rickettsia typhi, R. prowazekii) cause outbreaks and the spread of rickettsial diseases into new areas or new vectors necessitates field investigations. In prior outbreaks, EISOs have conducted patient interviews, collected human, animal, and environmental samples, reviewed medical charts, and collected ticks. The Epi-Aids allow the EISO to work closely with state and local public health partners. Because rickettsial outbreak work does not happen consistently, we support our EISOs responding to emergency response deployments and other Epi-Aids. Our most recent EISO conducted primary data collection, worked with international partners, planned and conducted field work, and published preliminary results from the RMSF prevention intervention project in Sonora, MX; deployed to Liberia for Ebola response; and participated in a Seoul virus Epi-Aid.

Twice a year, team members from RZB travel to certain tribal nations in Arizona to provide technical assistance in the bi-annual Rocky Mountain Spotted Fever Collaring Campaigns. This innovative prevention program integrates tick control on free-roaming dogs (via tick collars), environmental tick control (via pesticide application), and educational outreach. This collaborative project involves tribal leaders, tribal animal control, tribal community health workers, Indian Health Service environmental staff, AZ state and local public health officials, students from surrounding universities, and many others.

Additionally, the EISO will join the on-call schedule and will assist public health department, clinicians, and the general public with rickettsia-related inquiries. Additional opportunities to educate clinical care providers are possible including webinars, Clinician Outreach and Communication Activity (COCA) calls, and trainings for regional meetings or to fulfill state requests for tickborne disease surveillance trainings. RZB team members also assist in vectorborne disease workshops for public health partners during the CSTE annual meeting.

Proposed Surveillance Project:

Q fever (Coxiella burnetii) is a nationally notifiable disease, both in its acute and chronic forms. The serologic laboratory component of the chronic Q fever case definition might be overly restrictive, leading to cases of apparent chronic Q fever not being captured by surveillance. Occasionally, state health departments reach out to RZB to discuss the challenges of how to report medically managed chronic Q fever cases that do not meet the requirements of the current reporting requirements. Additionally, some of apparent chronic Q cases are misclassified as acute cases. The surveillance analysis will be focused on determining how often state reported cases are not counted and for what reasons, as well as how many chronic cases are being reclassified to acute. The EISO will conduct phone interviews with several key state public health stakeholders to understand the challenges states face in interpreting the case definition. Lessons learned and data acquired from this analysis will be an important first step in proposing surveillance case definition changes to the appropriate CSTE working group. Findings from this analysis will be reported in a concise public health report.

Current Position Data:

National surveillance data for RMSF and other SFGR, ehrlichiosis, anaplasmosis, and Q fever are nationally notifiable diseases and state and local health departments collect and report information through Case Report Forms and the National Notifiable Diseases Surveillance System. Data are available for analysis and 5 year summary reports will begin soon. RZB has access to IBM© MarketScan© Commercial databases; healthcare utilization data from Healthcare Cost and Utilization Project (HCUP) is available also.

Position Strengths: Wide range of activities from outbreak investigations, fieldwork, epidemiologic research, provider education, and data analysis. Strong interaction among laboratory and epidemiology programs within the branch. Flexible degree of travel. National surveillance from 2017 showed the highest cases to date for all of our reportable diseases. Your work here will have a direct public health impact!

Staff & Resources: EISOs work closely with mentors with diverse backgrounds that include surveillance, outbreak investigations, statistical methods, laboratory diagnostics, and communications. The division also offers statistical support.

Special Skills Useful for this Position: A variety of educational backgrounds are suitable for this position. The ideal EIS officer in this position is flexible, willing to travel up to 10% of their time, and comfortable (though not necessarily experienced) working with domestic and/or wild animals. Spanish language skills are a bonus.

Domestic Travel: 5% **International Travel:** 5%

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention

Every year, millions of Americans are infected with HIV, viral hepatitis, sexually transmitted diseases (STDs), or tuberculosis (TB). Tens of thousands die or experience debilitating complications because of these infections. HIV, viral hepatitis, STDs, and TB often share overlapping risk factors and disease interactions and disproportionately affect racial and ethnic minorities, men who have sex with men, persons who inject drugs, and other vulnerable populations. The Divisions in NCHHSTP work with a variety of partners, including health departments, school-based programs, academic institutions, and international partners. EIS officers in the NCHHSTP have the opportunity to do impactful work that saves lives, protects people, and reduces health disparities by preventing and controlling these infections domestically and internationally. Our center has a rich tradition of providing exceptional supervision and training of EIS officers, and is known for its diversity of epidemiologic, clinical, biological, psychosocial/behavioral, policy, and other public health approaches. This year, NCHHSTP is recruiting for positions in HIV, STDs, and TB, and adolescent health.

NCHHSTP-DASH-SBSB-Georgia-2019-01

Primary Supervisor: Heather Clayton, Health Scientist, EIS 2010

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Secondary Supervisor(s):

- Richard Lowry, Medical Officer, EIS 1990
- Zewde Demissie, Team Lead, EIS 2010

Background: The mission of the Division of Adolescent and School Health (DASH) is to promote environments where teens can gain fundamental health knowledge and skills, establish healthy behaviors for a lifetime, connect to health services, and avoid becoming pregnant or infected with HIV or sexually transmitted diseases (STDs). Surveillance of priority health risk behaviors is one strategy used to achieve that mission. Priority surveillance areas include sexual health behaviors, alcohol and other drug use, violence victimization/bullying, and mental health/suicidality. Risk behaviors in these areas are interrelated, often initiated during adolescence, and may lead to HIV infection and other STDs, unplanned pregnancies, and serious injuries or death. DASH provides financial and technical assistance to 49 states plus the District of Columbia, 28 large urban school districts, and 1 territory to conduct school-based surveillance through the Youth Risk Behavior Survey (YRBS) and the School Health Profiles (Profiles). For further information, see https://www.cdc.gov/healthyyouth/.
Current Work: Projects include: analyzing state-level Youth Risk Behavior Survey (YRBS) data to describe initiation patterns of prescription opioid misuse and other substance use; examining associations between prescription opioid misuse and heroin use; and participation in an Epi-Aid investigating increases in HIV diagnoses among persons who inject drugs in the Cincinnati area.
Proposed Initial Projects: 1) Examine how sexual and substance use behaviors that increase risk for HIV and other STDs are associated with other types of health risk behavior (e.g., violence victimization and mental health/suicidality-related behaviors/experiences) among sexual minority U.S. high school students, using the 2017 national YRBS. Significant associations can be assessed for effect modification and mediation effects through the introduction of covariates that are possible mediators of associations between exposure variables and outcomes.
2) Examine relationships between school district policies and health behaviors of high school students using the linked 2016 School Health Policies and Practices Study (SHPPS)/2017 school district YRBS data.
Proposed Analytic Project:
EISOs will have the opportunity to analyze large national, state, and local datasets to examine associations between sexual health behaviors, substance use behaviors, mental health, and/or experiences of violence victimization. Current work within the Division includes examining risk behaviors associated with nonmedical

use of prescription opioids, risk factors for suicide ideation and violence victimization, behavioral health disparities among sexual and gender minority students, and examination of secular trends in the prevalence of health risk behaviors/experiences over time.

With access to large, robust datasets that contain a wide range of priority risk behaviors/experiences, multivariable modeling techniques can be utilized to assess associations of health risk behaviors/experiences through calculation of adjusted prevalence ratios (aPRs) and adjusted odds ratios (aORs) with corresponding 95% confidence intervals. Significant associations can be assessed for effect modification and mediation effects through the introduction of interaction terms and covariates that are possible mediators of associations between exposure variables and outcomes. Officers will also have the opportunity to conduct state of the art secular trend analyses that examine linear and non-linear (quadratic, cubic, etc.) changes in the prevalence of a wide range of health risk behaviors over the past 27 years (1991-present). Well established analytic methods are fully developed and routinely employed to assess and compare trends in health risk behaviors and experiences among a variety of demographic and behavioral subgroups of youths.

Proposed Field Investigation Project:

DASH fully supports EISOs participating in Epi-Aids and emergency response deployments. Our current EISO participated in an Epi-Aid investigating ongoing clusters of newly identified HIV infection occurring among people who inject drugs, in the northern Kentucky/Cincinnati, OH metropolitan area. Earlier DASH EISOs also participated in Epi-Aids (e.g., West Nile Virus outbreak, Pertussis outbreak) and emergency response deployments (e.g., Rabies vaccination of first responders).

EISOs will primarily interact with public health partners through field investigations. However, Officers will also have the opportunity to work with public health and education professionals in state and local public health departments and education agencies in the analysis of public health surveillance data collected by our funded partners. Our current EISO is collaborating with staff in the Virginia Department of Public Health to conduct epidemiologic analyses of the misuse of prescription opioids among high school students, using data from the Virginia Youth Risk Behavior Survey. Travel to a grantee site or other funded program site or participation in reverse site visits may be possible depending on the project focus area developed by the EISO. Attendance at national conferences for the purpose of presenting EISO's research projects is also encouraged.

Proposed Surveillance Project:

Examples of surveillance evaluations include the following:

1) Assess the surveillance system implications of moving the Youth Risk Behavior Survey (YRBS) from an in-classroom, paper and pencil survey to an on-line survey.

2) Evaluate the School Health Profiles (Profiles) surveillance system, which monitors school health-related policies and practices at the state, local, and territorial levels; for example, evaluate the prevalence and characteristics of school health policies and practices that facilitate the provision of confidential sexual health services to high school students (e.g., types of services provided, types of service providers and sites utilized, confidentiality provisions, financial/billing provisions for services provided, etc.).

3) Conduct an evaluation of the gender identity/expression and sexual identity/same-sex behavior components of the national, state, or local YRBSS; for example, evaluate current methods of assessing sexual and gender minority youth in a school-based surveillance system.

Interaction with state and local departments of education and health, and national organizations that offer school- and community-based educational programs to reduce the prevalence of adolescent health risk behaviors will occur through conference calls and attendance at national meetings. Travel to a grantee site or other funded program sites (or reverse site visits) as well as participation in surveillance training meetings with funded partners may be possible depending on the surveillance project focus area developed by the EISO.

Current Position Data:

Available datasets include: 1) biennial national, state, and local school-based YRBS datasets during 1991-present; 2) a sexual minority dataset that combines YRBS data from large urban school districts and states from 1995-present; 3) state and local Profiles datasets during 2006-present, which assess school health policies and

practices in states, large urban school districts, and territories; 4) SHPPS datasets during 1994-2016, which assess school health policies and practices at the state, district, school, and classroom levels; 5) a linked 2016 SHPPS/2017 school district YRBS data, which can be used to examine associations between school policies and student behaviors.
Position Strengths: An ideal position for those interested in "˜large dataset analysis, behavioral epidemiology, and analysis of secular trends in health risk behaviors at the national, state, and local levels. There is also an opportunity to conduct meaningful analyses of school health policies and practices in middle and high schools. The team supporting the EISO (i.e. supervisors) is very invested in developing a top notch scientist, while tailoring the DASH EIS experience to the EISO's interests and career objectives.
Staff & Resources: Supervision is provided through close interaction with career staff and consultants with expertise in the areas of epidemiology, maternal and child health, preventive medicine, school health education, research psychology, community health, survey research, public health law, statistics, and data processing. There are 5 full-time EIS alumni staff in the School-Based Surveillance Branch who are available to consult with EISOs, including Primary/Secondary Supervisors, Team Leads, and Branch Chief. Also, there is currently a first year EISO in the branch.
Special Skills Useful for this Position: Interest in school health, behavioral epidemiology, and the population of school-aged youth, as well as strong data analysis interest and skills, are important for this position. EIS Officers who have prior experience with, or an interest in learning, SAS and SUDAAN should do well in this position.
Domestic Travel: 5% **International Travel:** 0%

NCHHSTP-DHPSE-EB-Georgia-2019-01

Primary Supervisor: Kate Buchacz, Team Lead, Epidemiology Research Team, EIS 2002

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Secondary Supervisor(s):

- Robyn Neblett Fanfair, Team Lead, Health Services Prevention with Positives Team, EIS 2010
- Jun Li, Epidemiologist, EIS 2006

Background: This EIS position will be in DHAP's Epidemiology Branch, shared between the Epidemiology Research Team (ERT) and the Health Services Prevention with Positives Team (PWP). The mission of ERT is to investigate and synthesize behavioral, clinical and social outcomes data to characterize the U.S. HIV epidemic and its determinants to improve prevention and treatment services, especially for disproportionately affected and at-risk communities. This includes investigating and characterizing novel modes of HIV infection and unusual or sentinel clusters of HIV infection. The mission of the PWP is to conduct implementation science to improve access to and delivery of HIV care in order to improve health outcomes of HIV-infected persons and prevent onward transmission of HIV.

DHAP's Epidemiology Branch has a long history of excellence in training EISOs (with 6 EISOs since 2014). EISOs and scientific staff in the Branch have had prominent roles in domestic and international emergency outbreak response including the Zika Response and HIV outbreaks associated with opioid injection drug use in West Virginia, Massachusetts and Kentucky/Ohio. Officers have been able to work on projects across Teams in the Branch, elsewhere in the Division and Center, and with external partners, for a variety of field, analytic, and program opportunities.
Current Work: Analyzed HIV post-exposure prophylaxis use among men who have sex with men (MSM) in New York City; investigated three separate epidemiologic HIV clusters associated with transmission via injection drug use (IDU) in West Virginia, Massachusetts and Kentucky/Ohio; analyzed resilience, condom use self-efficacy, internalized homophobia, and condomless sex among Black MSM

Proposed Initial Projects: 1. Analyses of CoRECT data project data to examine clinic variables, cost, barriers to care or standard of care over time.
2. Analyses of chart abstraction or qualitative data from persons who inject drugs in Massachusetts, focused on access and utilization of services, risk reduction practices.
3. Analyses of behavioral, social and structural determinants of HIV risk in geographic areas with high rates of disease in a MARI project.

These are some possible initial projects, however, we also encourage EISOs to propose and address new research questions relevant to HIV prevention and care.
Proposed Analytic Project:
Current projects on ERT (see #1-3 below) and PWP (see # 4-6 below) with analytic opportunities for an EISO during 2-year timeframe include:

(1) HIV Outpatient Study (HOPS), a large prospective multi-site U.S. HIV cohort, continuously recruiting since 1993 and partnering with the international HIV cohort collaboration (NA-ACCORD)
(2) The Minority HIV/AIDS Research Initiative (MARI) to build capacity for HIV prevention research in highly affected minority communities
(3) Qualitative data surveys from persons who inject drugs (MA Epi-Aid).
(4) The Cooperative Re-Engagement Controlled Trial (CoRECT) of a joint health department-provider model to identify HIV+ patients who are out-of-care and intervene to improve linkage, retention and HIV viral load suppression
(5) Improving HIV prevention and treatment outcomes by integrating community pharmacists and clinical sites with patient-centered HIV care
(6) Revising the Framework for Elimination of Perinatal HIV Transmission in the US

The HOPS and NA-ACCORD projects contain comprehensive longitudinal data on diagnoses, treatments and labs. These large observational databases enable research on infectious or chronic conditions, and various aspects of care and management of HIV. EISOs would examine confounding and effect modification and perform multivariable modeling (e.g., Cox proportional hazards models or Poisson regression).

The CoRECT multisite trial represents a collaborative effort between CDC and three health departments, Connecticut, Massachusetts, and Philadelphia. Secondary analyses may involve exploring barriers to care, changes in standard of care, or cost analysis using combination of HIV surveillance and program data.

MARI project analyses are frequently cross-sectional and involve logistic regression.

See also "Proposed Initial Projects"□.
Proposed Field Investigation Project:
DHAP's Epidemiology Branch works closely with the HIV surveillance branches and shares responsibility for investigation of emerging clusters of HIV infection. During 2017-2018, three EISOs in the Branch led or participated in the Epi-Aid responses of HIV transmission through injection drug use in West Virginia, Massachusetts, and Kentucky/Ohio. These projects involved collaboration with state and local health departments, EISO-led protocol development and project implementation, data analyses and results dissemination.

During the Massachusetts Epi-Aid, the activities included constructing and analyzing sexual and injection-drug use partner networks and HIV molecular cluster data, designing surveys and conducting qualitative interviews, and abstracting medical chart data for HIV-infected persons linked to the outbreak. The EISOs collected original primary data by interviewing people who inject drugs about their injection practices, use of syringe services programs and medication-assisted therapy, and various social determinants of health. They also interviewed

local stakeholders (clinical providers and public health authorities) about harm reduction programs and HIV and hepatitis screening and treatment services. The EISOs are presently completing analyses of qualitative data with support of DHAP subject matter experts and finalizing the main manuscript.

International and other field projects have also occurred. One recent EISO participated in the Zika Response by deploying with the Pregnancy and Birth Defects Task Force to Bogota, Colombia. Another recent EISO led a multidisciplinary NCHHSTP team in a series of conference calls and an invited in-person consultation to a tribal health authority in the Northeastern US to strengthen harm reduction services in response to an opioid epidemic.
EISOs in the Branch have opportunities to collaborate with local and state health department partners, by leading or assisting in HIV outbreak investigations (Epi-Aids). EIS Officers are members of DHAP's Outbreak Coordination Unit.

If working on analyses of the HOPS or NA-ACCORD data (see naaccord.org), the EISO would have an opportunity to work closely with academic partners (HIV clinicians) and industry (HOPS contractor) on analyses to understand and improve care and management for chronic HIV infection in the US.

The CoRECT multisite trial represents a collaborative effort between the CDC and three health departments, Connecticut Department of Public Health/Yale School of Medicine, Massachusetts Department of Public Health and the Philadelphia Department of Public Health. The project is finishing data collection. It would afford the EISO opportunities to interact with these partners and attend site visits and be involved in the dissemination of the results and lessons learned for increasing re-engagement in HIV care. See:
https://clinicaltrials.gov/ct2/show/NCT02693145

Support to the MARI project would involve working with research partners in academia (CDC grantees) serving in Black and Latino communities on HIV prevention research in these communities to address pertinent and community-driven research questions, and may offer opportunities to attend site visits.

There are no specific international activities on ERT or PWP teams, but an EISO desiring some international experience will be supported in identifying international projects through the Epi Branch's Clinical Trials Team (sites in Kenya and Thailand), or gaining international field experience through the work of other Divisions at CDC.
Proposed Surveillance Project:
The surveillance evaluation project will focus on improving assessment of the HIV care continuum. Engagement in HIV care is necessary for patients to receive HIV medications that suppress HIV and reduce the risk of HIV transmission to others. Correctly identifying persons who have fallen out of HIV care, and re-engaging them in care, is a challenge for local health departments and clinicians. The proposed project will assess the combined utility of HIV surveillance and other ancillary databases to more accurately identify persons who had fallen out of care, so that health department re-engagement efforts can be more targeted and efficient. Although, traditionally, a gap in routine laboratory tests results in HIV surveillance has been used as a sole proxy for disengaging from HIV care, this approach may fail to account for patients who have moved out of jurisdiction, died, or needed less frequent HIV laboratory monitoring. Local health departments, however, have other data sources (e.g., STD partner services data, pharmacy refills) that can be used to develop a combined approach to better predict which patients have truly fallen out of HIV care. This project will build upon lessons learned from the CoRECT project, the first RCT to analyze the effectiveness of a combined health department-health provider data-to-care model for re-engaging patients in care. In addition to reviews of surveillance and epidemiologic reports in collaboration with the local health department staff, the project would likely involve a site visit to one health department participating in the CoRECT study.
Current Position Data:

Data are available from existing large U.S.-based cohorts of persons with HIV (HOPS and NA-ACCORD); Minority HIV/AIDS Research Initiative (MARI)-related projects; ongoing and prior clinical trials and other projects in the Branch (e.g., CoRECT); a large health service records database (Marketscan), and quantitative and qualitative secondary data from recently completed Epi-Aids.
Position Strengths: EIS officers are valued team members and mentoring is a priority. EIS training in the Epidemiology Branch dates back to the beginning of the HIV epidemic and alumni are in senior public health positions. The Branch is highly productive scientifically (75 publications in 2018). EISOs work closely with senior and mid-level scientific staff, including statisticians and data managers. There is a focus on HIV prevention efforts with disproportionately affected communities. EISOs gain expertise in epidemiologic research and project implementation skills that are transferrable and prepare for leadership positions in many areas of public health research and practice.
Staff & Resources: DHAP's Epidemiology Branch is focused on domestic HIV/AIDS epidemiology, prevention and health services research. It has four scientific Teams, and approximately 60 full-time scientists and support staff, most based in Atlanta, with a small number of field staff stationed in Kenya and Thailand. Although most work will be done with ERT and PWP core projects, the EISO will be able to work with staff across the Branch, to include data managers and statisticians for training in analyses and SAS programming. Travel to the field for outbreak responses and visits to domestic sites, and possibly international sites occurs, as opportunities present.
Special Skills Useful for this Position: EISOs with a variety of skills have successfully worked in the branch, including Ph.D. Epidemiologists, Infectious Disease Physicians, Internists and Pediatricians. An interest in HIV care and epidemiology is essential, and interest in investigation of HIV clusters is desirable. A willingness to learn SAS data programming and analysis, and also some qualitative analytical skills, is helpful.
Domestic Travel: 10% **International Travel:** 5%

NCHHSTP-DSTDP-EB-Georgia-2019-01

Primary Supervisor: Ginny Bowen, Epidemiologist, EIS 2013

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Secondary Supervisor(s):

- Kristen Kreisel, Epidemiologist

Background: Gonorrhea, chlamydia, and syphilis"”the three most common nationally notifiable diseases in the U.S."”have all increased over the past 4 years. The Division of STD Prevention (DSTDP) is charged with preventing, controlling, and monitoring these STDs"”among others"”and we need your help to do it! As we think about increasing numbers, we recognize the changing U.S. healthcare landscape, where fewer people seek care at specialty STD and Family Planning clinics and women may receive preventive services, such as Pap smears, less frequently. Advances in HIV treatment, pre-exposure prophylaxis for HIV, and changes in sexual behavior also challenge the way we think about traditional STD prevention and control. We need your brainpower as we explore factors contributing to STD increases and evaluate the programmatic solutions that will bring these rates down again. In addition to working with traditional STD pathogens, DSTDP has forged partnerships and plays a role in investigating less-traditional pathogens where sexual transmission is involved, including Ebola and Zika. Although domestic STD response is our primary responsibility, DSTDP supports international efforts related to gonorrhea antimicrobial resistance monitoring and elimination of congenital syphilis. Recent EIS Officers have worked in Haiti, Liberia, Malawi, Peru, and the US-Affiliated Pacific Islands.
Current Work: Responded to syphilis, HIV, & meningitis outbreaks; analyzed neuro-/ocular-syphilis data and complex survey data about STD sequelae; implemented surveillance system to monitor antibiotic resistance in extragenital gonorrhea; led national STD Treatment Guidelines section revisions; evaluated prenatal syphilis screening; evaluated novel syphilis rapid test; analyzed program data to optimize STD investigations.

Proposed Initial Projects: To select an initial project, the supervisors will assess the new Officer's background in data analysis and the skills that the Officer wishes to learn, and work with the Officer to select an initial project. Analyses using data from the National HIV Behavioral Surveillance (NHBS) surveys, Sentinel Surveillance Network (SSuN) project, and STD case reports are clean and ready to be analyzed beginning within the first month. Fieldwork may occur at the end of the first month if the Officer selects a surveillance evaluation project that necessitates accessing state or local records.

Proposed Analytic Project:

Initial project ideas include:

1) Using data from a venue-based survey of men who have sex with men (MSM) to evaluate STD prevalence and prevalence of certain sexual behaviors by length of time in which respondents have been sexually active with men (referred to by some as "˜gay age'). Data from this survey have already been collected and cleaned, but the EISO would be responsible for developing an analytic plan before beginning analysis;

2) Using existing data from 30+ STD clinics in the U.S. (participating in the STD Surveillance Network [SSuN]) to analyze incidence and repeat infection rates of chlamydia or gonorrhea among heterosexual male and female patients. This project can also be expanded to include multivariate analyses evaluating risk factors for or prediction of repeat infection;

3) Using existing data from 30+ STD clinics participating in SSuN to investigate STD prevalence and risk behaviors among pregnant teens;

4) Working with a local health department to develop procedures for matching female syphilis records with Vital Statistics (birth and infant death) records to determine how much"”if any"”congenital syphilis may be "˜missed' by current surveillance approaches. Several local health departments have already completed this exercise and have shared protocols and code with the Division. The EIS officer may travel to a health department in order to advance this analysis.

Proposed Field Investigation Project:

DSTDP Officers typically participate in 2--3 field investigations during their 2-year training program. Although STDs are often endemic, STD outbreak investigations and exploratory field work are quite common. Because STD outbreaks can be complex and multifaceted, DSTDP field investigations often entail several months of planning, last anywhere from 1--3 weeks "˜in the field,' and often focus on identification of programmatic solutions. Recent investigations include a syphilis knowledge, attitudes, and practices (KAP) survey among MSM and their providers following a syphilis increase in Alaska; a chart-abstraction-based investigation of prenatal syphilis screening coverage at a large delivery hospital in Guam; a chart-abstraction investigation assessing treatment adequacy following an increase in syphilis cases among MSM in Oregon; a record-abstraction investigation describing risk factors for ocular syphilis in North Carolina; a case-control study exploring the role of geospatial "˜hook-up' apps among MSM in Oregon; response to a multi-state heterosexual syphilis outbreak on an American Indian reservation in the Central Plains; and a chart-abstraction-based examination of STD screening among American Indians at an urban Indian Health Service Hospital in Arizona. DSTDP Officers also participate in other outbreaks where sexual transmission is implicated, including HIV, Zika, meningitis, and Ebola outbreaks. The Division is fortunate to have DSTDP epidemiologists sitting in 8 state and local STD Programs throughout the U.S., which helps facilitate field experiences.

DSTDP is somewhat unique in that it provides direct funding to support STD Programs in all 50 states, 7 independently-funded cities, and 2 U.S. territories. In addition, the Division funds STD Program functions in the U.S.-affiliated Pacific Islands. Because of these long-standing relationships, the EIS Officer will have ample opportunity to interact and engage with STD partners from across the country. Most commonly, EIS Officers are invited to participate in the provision of technical assistance (T.A.) on issues related to surveillance or prevention programming. The current EIS Officer has helped to implement a new surveillance system"”monitoring

antimicrobial resistance of extragenital gonorrhea'"”which has afforded her numerous opportunities to interact with local health departments in the course of providing trainings and technical assistance about the new system. Prior Officers have visited DSTDP's field epidemiologists and funded partners to conduct surveillance evaluations, assist with site visits, or to conduct specific analyses that require on-site access to data systems. The EIS Officer will have the opportunity to attend a national Pelvic Inflammatory Disease (PID) Consultation that the Division is hosting this fall, which will draw national and international experts from academia, state/local health departments, and public health agencies to develop a research agenda for PID and related STD sequelae.
Proposed Surveillance Project:
1) Evaluate Lymphogranuloma Venereum (LGV) surveillance to identify methodologies for national surveillance. The evaluation will include a site visit to an area reporting high levels of LGV and may assist DSTDP with refining the current chlamydia case definition.

2) Evaluate active versus passive approaches to congenital syphilis surveillance to determine how different approaches may lead to differences in reported case-counts. The evaluation will involve working with a health department that began active follow-up of female syphilis cases to assess whether active female follow-up improved congenital syphilis reporting.

3) Assess the completeness and validity of congenital syphilis case report data and better describe the proportion of reported cases meeting maternal or infant criteria for congenital syphilis. The evaluation will likely involve collaborating with 1--2 health departments and on-site review of medical and interview records.

4) Evaluate national chancroid surveillance to provide recommendations to the Council of State and Territorial Epidemiologists (CSTE) on national surveillance strategies.
Current Position Data:
National gonorrhea, chlamydia, chancroid, adult syphilis, and congenital syphilis case report data; National Health and Nutrition Examination Survey (NHANES) data on chlamydia, herpes, trichomonas, pelvic inflammatory disease, infertility, and sexual behaviors; National Survey of Family Growth (NSFG) data on STDs, screening, sexual behaviors, pregnancy, and contraception; data from the STD Surveillance Network (SSuN) monitoring STDs, HIV, and behavioral data; data from sentinel surveillance systems monitoring gonococcal antimicrobial resistance (GISP, eGISP); STD clinic and surveillance data from eight field sites; National Job Training Program Data; STD prevalence and screening data from the National HIV Behavioral Surveillance (NHBS) venue-based survey; and more.
Position Strengths: Fun, smart people committed to improving sexual health. Many EIS alumni in the Division invested in mentoring the next generation of public health leaders. Opportunities to learn about epidemiologic methods and surveillance in a position straddling two Branches. Cross-divisional work to investigate sexual transmission of other organisms, including N. meningitidis and Shigella. Robust epidemiologic opportunities'"”including outbreak response'"”alongside the opportunity to learn programmatic interventions that work (and don't work) to prevent and control STDs. Brainstorming and problem-solving with colleagues from diverse backgrounds. Project leadership opportunities. Support for trainings and presentations at national conferences. Did we mention fun people?
Staff & Resources: DSTDP has many former EIS Officers and staff from a wide range of backgrounds who will work with you, including: Epidemiologists, Behavioral Scientists, Programmers/Data Managers, Administrative Support, Economists, Mathematical Modelers, Evaluators, Health Communications, and Statisticians. Introductory seminars provide an orientation to multiple STDs and an overview of interesting work in the Division. The Center offers training in scientific and abstract writing for EIS Officers. Officers are encouraged but not required to attend the 2-week "˜Principles of STD/HIV Research' course at the University of Washington in the summer (but seriously, 2 weeks in Seattle in the summer, why wouldn't you go?).
Special Skills Useful for this Position: Ability to work with multidisciplinary groups. Clinical or analytic expertise. Creativity. Curiosity. Sense of humor.
Domestic Travel: 10% **International Travel:** 5%

NCHHSTP-DTE-SEOIB-Georgia-2019-01

Primary Supervisor: Rebekah Stewart, Nurse Epidemiologist, EIS 2015

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Secondary Supervisor(s):

- Julie Self, Epidemiologist, EIS 2015
- Adam Langer, Team Lead, EIS 2006

Background: The Surveillance, Epidemiology, and Outbreak Investigations Branch (SEOIB) in DTBE is committed to eliminating TB in the United States through collaborative prevention and control efforts with our domestic and international partners. EIS officers are integral to this work, supporting all aspects of the branch's work including leading TB outbreak investigations, conducting analytic studies to identify and assess focus areas, and improving TB surveillance. SEOIB has mentored EISOs in this work since the resurgence of TB in the early 1990s. We provide onsite and remote epidemiologic support to state and local TB programs for outbreak investigations, giving officers diverse opportunities to gain field epidemiology experience. We also maintain the National TB Surveillance System (NTSS), a national TB registry of over 350,000 TB case reports from 1993 to the present, which are systematically linked to over 120,000 genotyping results from the National TB Genotyping Service (NTGS) launched in 2004. We now conduct whole genome sequencing on isolates from every culture-confirmed TB case in the country, leading to many new opportunities for ground-breaking work. Epi-Aid field investigations led by our EIS officers have included TB outbreak investigations in community and healthcare settings, homeless shelters, and correctional and detention facilities.

Current Work: Division of Tuberculosis Elimination (DTBE) EIS officers recently led diverse projects, including: TB outbreak investigations throughout the United States; assessing TB control practices among persons experiencing homelessness; evaluating surveillance for large TB outbreaks; analyzing TB-related mortality data; and assessing TB trends among persons with socio-demographic risk factors for TB.

Proposed Initial Projects: The EIS officer can immediately begin work on the surveillance evaluation and most of the analytic projects that they choose, as the data are readily available. Field investigations will take priority when they occur, but most other projects can be started in the meantime. If desired, the EIS officer can plan to submit an abstract based on their research to the EIS conference within months of beginning the assignment.

Proposed Analytic Project:

TB-HIV Co-Infections in the United States

Since 2011, ~80% of TB patients have had an HIV test result, although testing differs by population.. The most recent analysis of NTSS data on TB-HIV co-infections is > 10 years old and many questions remain unanswered, including drug resistance patterns and severity of disease among recent patients. NTSS includes >100,000 case records reported since 1993, allowing for exceptional statistical power. Readily available data include patient characteristics, infecting organism, and treatment outcomes that easily support multivariable modeling, assessment of confounding and effect modification, and other advanced statistical methods.

Assessment of new US Preventive Services Task Force (USPSTF) Screening Recommendations and Latent TB Infection (LTBI) surveillance in the United States

In the United States, approximately80% of TB cases are the result of untreated latent TB infection (LTBI). The USPSTF recommends screening for LTBI in populations at high risk for TB; CDC recommends treating persons with TB infection. This project would utilize a mixed-methods approach to assess public health capacity and readiness to implement new LTBI screening recommendations. EISO would participate in design, data collection, analysis and presentation.

World TB Day Trends in Tuberculosis MMWR report

High-impact first-author publication within eight months of starting position reporting TB counts and rates based on TB cases reported during the previous year. These analyses include trends over time and descriptive epidemiology for populations of interest in TB prevention and control. EISO conducts analyses and collaborates to communicate key findings, recommendations for upcoming year, and priorities for TB elimination activities.

Proposed Field Investigation Project:

EIS Officers in SEOIB never have trouble fulfilling the Field Investigation CAL. Each year, SEOIB assists state and local partners with on-site technical assists and/or Epi-Aids to investigate and mitigate TB outbreaks. Based on interest and availability, our EIS Officers lead or participate in these efforts. Recent field investigations include a large TB outbreak in a rural setting among U.S.-born persons, a large outbreak among persons experiencing homelessness in an urban city, an outbreak of multidrug-resistant TB among older non-U.S.--born adults, and a TB investigation in Alaska. Primary data collection opportunities may also be available for other projects, such as evaluating barriers to effective LTBI diagnosis and management. We also support our officers to pursue opportunities outside of DTBE for additional field investigation experience if they choose and assist our officers in finding opportunities to conduct international field work. Recent DTBE officers have contributed to important international efforts combatting Zika and Ebola.

Nearly all of the work we conduct in SEOIB involves collaborating with our state and local partners. Any TB outbreak investigation will include integrating with the affected state and local health department and/or community organizations such as homeless services providers. The EIS officer will support SEOIB efforts to build strong relationships with our partners, including regular telephone and email communication with TB programs around the country to discuss TB clusters with outbreak potential and provide technical assistance. During field investigations (Epi-Aids and on-site technical assistance), EIS Officers have opportunities to collaborate in-person with local TB programs and other public health partners such as healthcare facilities and community organizations, depending on the nature of the investigation. During the annual Outbreak Detection Working Group meeting, the EIS officer can engage with state and local TB partners to discuss current issues and best practices for outbreak detection and investigation. Additional activities not listed elsewhere may include collaborations with the CDC Centers of Excellence, which are funded by CDC to provide training, education, and medical consultation to support TB control and prevention efforts.

Proposed Surveillance Project:

DTBE conducts routine molecular surveillance for all culture-confirmed cases of TB in the United States. The objective of this surveillance system is to detect clusters of possible recent transmission, which are assessed systematically each week to help determine when to prioritize public health action. Since 2011, DTBE has defined a cluster as two or more TB cases diagnosed during a 3-year time period with Mycobacterium tuberculosis isolates that match by genotype. These conventional genotyping methods represent approximately 1% of the TB genome. In 2018, CDC established the National TB Molecular Surveillance Center to perform whole-genome sequencing (WGS) for all culture-confirmed TB cases. WGS provides added resolution for examining genetic relatedness of M. tuberculosis isolates, which may have an impact on cluster assessment and prioritization outcomes.

Using the CDC surveillance evaluation framework, the incoming EIS officer can conduct an evaluation to assess the impact of WGS and phylogenetic analysis on DTBE's cluster review and prioritization process. The project findings may be used to improve CDC's cluster assessment and prioritization process, document the impact of next generation sequencing on public health practice, and demonstrate the potential uses of WGS in trainings for state and local TB programs. Julie Self, Ben Silk, and Rebekah Stewart will mentor the officer to complete this project.

Current Position Data:

National TB Surveillance System and National TB Genotyping Service provide linked datasets that are recognized nationally for their quality and timeliness. Tuberculosis Epidemiologic Studies Consortium (TBESC) data are available for analysis on strategies and tools to increase diagnosis and treatment of latent tuberculosis infection

(LTBI) in high-risk populations. Officers also gain experience in primary data collection during outbreak field investigations.

Position Strengths: This position supports a diverse set of public health experiences addressing significant domestic public health problems and allowing completion of the CALs without needing any supplemental experiences. Officers lead impactful field and analytic investigations that inform targeted public health interventions while honing skills in applied epidemiology. Enthusiastic mentors, many of whom are EIS alumni and all of whom are experts in their field, from a variety of backgrounds, provide support for diverse training opportunities.

Staff & Resources: DTBE's staff consists of medical professionals, epidemiologists, statisticians, laboratory specialists, public health associates, and more! Support for all aspects of the position is available within the branch, and staff can provide specialized support for data analysis, SAS or R programming, scientific communication, medical consultation, and policy-making. Two supervisors are recent EIS graduates with an understanding of what makes EIS a successful and productive two years; the third has 13 years of CDC experience and has mentored several EISOs. The EISO will be supported by a team of people with decades of collective EIS supervision experience to ensure a successful assignment.

Special Skills Useful for this Position: Past officers have come from a wide variety of clinical and nonclinical academic backgrounds; some have had doctoral-level epidemiology training while others have started their epidemiology careers in DTBE. The most important qualities for success are intellectual curiosity about tuberculosis and programs to prevent it, eagerness to listen to and learn from a variety of partners (including patients and frontline health department staff), and willingness to challenge oneself to lead public health investigations.

Domestic Travel: 15% **International Travel:** 0%

National Center for Health Statistics

The National Center for Health Statistics (NCHS) is the nation's principal health statistics agency, providing data to address health issues. These health statistics track the health status of the U.S. population, measure the impact of major policy initiatives, characterize access to and use of the health care system, monitor trends in health indicators, and Identify disparities in health status and health care use. NCHS uses a variety of data collection mechanisms to obtain accurate information from multiple sources to provide a broad perspective to understand the prevalence of health conditions and adverse outcomes for the overall population and at-risk populations. Data sources include birth and death certificates, patient medical records, personal interviews, standardized physical examinations and laboratory tests, and health care facilities and providers. The Center focuses on providing objective, independent interpretation and dissemination of the data it collects.

NCHS-DHNES-OD-Maryland-2019-01

Primary Supervisor: Susan Lukacs, Science Advisor, EIS 2001

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Secondary Supervisor(s):

- Jody McLean, Geneticist
- Mark Eberhardt, Senior Epidemiologist, EIS 1983

Background: The National Health and Nutrition Examination Survey (NHANES) is the premier source of health examination information in the United States for over 50 years. It collects physical examination, laboratory, and questionnaire information from ~5,000 persons annually who comprise a nationally representative community--based sample of the US population. It collects data on 1) risk factors including environmental exposures, physical activity, nutrition, and other health behaviors; 2) dental, sensory, reproductive and other health status measures, and 3) infectious and chronic disease health outcomes. NHANES is unique in that it combines personal interviews with standardized physical examinations and includes a blood draw and urine collection for analysis in laboratories. NHANES has a biorepository that stores samples available for future research. The NHANES DNA biorepository is the only nationally representative DNA bank. Resulting genetic data from research is available. The officer will have the opportunity to assess the relationship between genetics and chronic conditions, health status and environmental exposures; impute additional SNP data; and assess oral microbiome data. This position will focus on genetics, bioinformatics, and NHANES data. NHANES has sponsors from CDC, NIH, USDA, and private and academic sectors. The officer may have the ability to collaborate with scientists from these sectors.

Current Work: Examination of the prevalence and patterns of marijuana use among NHANES participants with select health conditions; anemia prevalence and trends among adults aged 65 years and older; human exposure to organophosphate pesticides, insufficient sleep and obesity among US adults; attempts to lose weight among US adolescents.

Proposed Initial Projects: The officer would begin by becoming familiar with NHANES, how it is designed, conducted, and analyzed. Next, become familiar with the biospecimen program for genetic data and other big data, the Genetics Data Repository and then how these data can be analyzed and the process for analyses. This would lead the officer into beginning their own analytic project and also a surveillance project.

Proposed Analytic Project:

The officer will be able to use linear regression models to test for associations between genetics and chronic disease, health status, and environmental exposures using data from NHANES. The opportunity is available to impute additional SNP data using novel genetic software programs. The officer may also have the opportunity to learn novel data visualizations techniques to present these data.

Proposed Field Investigation Project:
Generally, there are no opportunities instigated by NCHS to fulfill a field investigation; however, the Center and Division are very supportive of EISOs participating in Epi-aids or emergency deployments originating from other CIOs as they may arise. Examples of previous or current EISO field investigations include evaluating pseudomonas infections at a hospital neonatal intensive care unit; reviewing state mortality records for youth suicide, validating hospital neonatal abstinence syndrome records for a State Health Department, and assisting CDC investigations of Ebola and Zika.
The position is in the Washington, DC area at a world-renowned research institution that has strong relationships with Atlanta CDC colleagues, researchers at the National Institutes of Health (e.g. NIDDK, NCI, NHLBI, and NEI) and collaborators at other Federal agencies. The Officer will conduct epidemiologic research with direct implications aimed at public health improvements, while gaining an in-depth understanding of a national community-based survey, which has served as a model for other countries.

Proposed Surveillance Project:
Evaluate feasibility of doing testing for microbiome on a national health survey. Evaluate NHANES to monitor total burden of a chronic disease, i.e. undiagnosed conditions, such as undiagnosed diabetes, undiagnosed hypertension, or undiagnosed infectious diseases (for example HPV). During any surveillance assessment, the officer could conduct interviews with stakeholders, or visit the NHANES mobile exam center as feasible.

Current Position Data:
National Health and Nutrition Examination Survey (NHANES) Genetic Data Repository for the years 1991-2008; NHANES oral microbiome dataset for the years 2009 to 2012, NHANES survey data 1999 -2018 and previous NHANES.
Position Strengths: The incoming EIS Officer will work with readily available novel datasets and combine data with traditional NHANES data to be at the forefront of analyzing national representative big datasets. The officer will have opportunities to learn how large national survey data are designed, collected, and analyzed by working alongside those people who make that happen. By working in the Washington, DC area there are opportunities to learn about the CDC Washington office and other HHS agencies that may be of interest.
Staff & Resources: The Division has a full staff of epidemiologic researchers and statisticians (including 5 physicians, 14 PhDs, and 3 nurses, 1 geneticist) with clinical, epidemiologic, and computer science expertise who are available to consult with the EIS officer. In addition, nine current or former EIS Officers are in the Division, who are keenly aware of the EIS experience. Off network scientific computer available for big data analysis.
Special Skills Useful for this Position: Suggested/willing to learn: SAS, R
Desirable: Plink, or other genetic statistical software packages.

Domestic Travel: 0% **International Travel:** 0%

NCHS-DHNES-AB-Maryland-2019-01

Primary Supervisor: Craig Hales, Medical Epidemiologist

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Secondary Supervisor(s):

- Cynthia Ogden, Branch Chief, EIS 1994

Background: The National Health and Nutrition Examination Survey (NHANES) is the cornerstone for national nutrition monitoring to inform nutrition and health policy. NHANES has been collecting thorough data on diet,

nutritional status, and chronic disease in cross-sectional surveys with nationally representative samples since the early 1970s. It is the only nationally representative survey that combines demographic, socioeconomic and dietary interview data with physical examination data such as biochemistries and body measurements. Data from NHANES are used for epidemiologic scientific research, such as the association of diet, dietary factors, foods, and nutrients with biomarkers and health outcomes. Dietary data are critical to describe food and nutrient intakes by the US population, development of the US Dietary Guidelines for Americans and diet quality indexes such as the Healthy Eating Index and the MyPlate icon for healthy eating. NHANES body measurement data were used to create the growth charts used by pediatricians and monitor blood folate levels after mandatory food fortification.

The focus of this position will be the analysis of NHANES data related to obesity and nutrition (e.g., body measurement, diet, laboratory measures), including the evaluation of health and nutrition disparities.
Current Work: Trends in weight loss among US adolescents; Disparities in short sleep duration; Association between active transportation and cardiovascular disease risk factors; Prevalence and patterns of marijuana use among NHANES participants with select health conditions; and Disparities in tap and bottled water consumption among U.S. adults.
Proposed Initial Projects: Using currently available NHANES data, the incoming EISO can begin with an analysis of associations between WIC (Special Supplemental Nutrition Program for Women, Infants, and Children) participation and obesity.
Proposed Analytic Project:
Using currently available data, the incoming EISO can choose from one of these projects, or propose their own based in their background and interest: 1) Examine the association between diet and the prevalence of chronic disease risk factors (e.g. iron deficiency anemia, cholesterol, obesity) among U.S. adolescents; 2) Explore differences and trends in dietary intake among non-Hispanic Asians compared to other race/Hispanic origin groups; 3) Examine differences in body fat distribution (using Dual X-ray absorptiometry) by race/Hispanic origin, and trends over time; and 5) Describe the demographic and health characteristics of the U.S. population with obesity and extreme obesity.
Proposed Field Investigation Project:
EIS officers assigned to this position will have the opportunity to participate in Epi-Aids, field investigations, or emergency response deployments with other CDC centers, as generally NCHS does not lead Epi-Aids. Previous EIS officers have deployed to Puerto Rico as part of the Zika emergency response and participated in an Epi-Aid to Utah for and investigation of fatal and nonfatal suicidal behaviors among adolescents.
The officer will have the opportunity to see NHANES operations in the field. Opportunities exist for collaboration with NIH and other CDC centers on analytic projects. Previous EIS officers have regularly guest-lectured and networked with EIS alums at Johns Hopkins, George Washington, and George Mason Universities. The officer may work on pilot projects for new or updated content within NHANES. The officer will be able to participate in federal meetings and attend Congressional hearings of the officer's interest.
Proposed Surveillance Project:
The EIS officer can choose among a range of health conditions or health risk behaviors, such as obesity, diet (e.g., fruit and vegetable intake), food security, or physical activity. EIS Officers have the opportunity to interact with NHANES field staff, as well as other federal agencies (e.g., NIH) and external stakeholders (e.g., universities) who fund various components of NHANES (e.g., environmental exposure measures, biospecimen program). Recent surveillance projects include: 1) Evaluation of the National Biomonitoring Program for surveillance of human exposure to organophosphate pesticides; and 2) Adult body weight surveillance in the United States using the National Health and Nutrition Examination Survey (NHANES).
Current Position Data:
NHANES data are already collected, cleaned and ready to analyze. New data for 2017-2018 will become available during Fall 2019. In addition to publicly available data, the EIS officer will also have access to data that is otherwise available only through the Research Data Center under restricted conditions. Other surveys at

NCHS include the National Health Interview Survey, National Vital Statistics System, and National Health Care Surveys.
Position Strengths: EIS officers will have flexibility to develop a project in their area of interest or begin with a proposed initial project. The officer will learn about obesity and nutritional epidemiology by working with subject matter experts in the field and gain a strong foundation in analyzing complex survey data by working with experienced survey statisticians.
Staff & Resources: The branch includes epidemiologists, statisticians, a nutritionist, and physicians - all are available for consultation.
Special Skills Useful for this Position: Prior knowledge of SAS, STATA, or R statistical software helpful but not required.
Domestic Travel: 0% **International Travel:** 0%

NCHS-DVS-WCDS-Maryland-2019-01

Primary Supervisor: Erin Nichols, Senior Epidemiologist, Global CRVS Team Lead, EIS 2009

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Secondary Supervisor(s):

- Kate Brett, Epidemiologist, EIS 1991
- Brian Munkombwe, Health Statistician/Service Fellow

Background: This position is a unique headquarters position within the Division of Vital Statistics at the National Center for Health Statistics (NCHS) in the suburbs of Washington, DC. The EIS officer who serves in this position will be an integral part of a small but influential unit that is making a large impact on the availability and quality of natality and mortality data sourced from Civil Registration and Vital Statistics (CRVS) systems""data that are essential for health planning and evaluation in low resource countries. As a partner of the Bloomberg Philanthropies Data for Health Initiative, we draw from NCHS's domestic expertise and supports work in multiple countries, including India, Kenya, Morocco, South Africa, and Zambia. Based within a federal health statistics agency, our unit uniquely contributes to the development of global standards and implementation guidance, and we participate in multiple global partnerships with experts from WHO and other UN agencies, academia, and country governments. This position offers a combination of applied/field epidemiology, analysis, and reporting/publications, with flexibility to pursue individual interests. With options for domestic and international projects, the EIS officer will gain expertise in CRVS that can be readily applied to almost any other area of public health.
Current Work: We do not currently have an officer. However, in 2014 we supervised an officer to conduct an "Evaluation of the Western Cape Mortality Surveillance System, South Africa" for the Medical Research Council and City of Cape Town to determine the added value of the WCMSS compared to national registration data.
Proposed Initial Projects: The following projects are expected to be ready to begin as soon as the officer is established in the position and suitable travel arrangements can be made: mortality surveillance system evaluation in Zambia; data analysis to support the national cause of death validation study in South Africa; analysis of India's National Health Resource Repository; and/or field investigation to verify road traffic deaths in Mumbai, India.
Proposed Analytic Project:
- Developing and implementing a methodology for combining data on cause of death from two sources: medical certificates of cause of death for deaths taking place in health facilities and verbal autopsy results for community deaths; factors to consider inc

Proposed Field Investigation Project:
- Field testing to asses the performance and acceptability of a recently updated WHO verbal autopsy

questionnaire that is used to collect information on cause of death, where there is no physician to certify the death; results will be utilized by the

All of the work of the Global CRVS Team is done in collaboration with partners. Our country technical assistance work is done in collaboration with and at the request of country governments (e.g., national and local health, statistics, and registration offices). The team collaborates with other technical assistance partners, including Vital Strategies, the Swiss Tropical and Public Health Institute, the University of Melbourne, and Johns Hopkins University. UN agency collaborators include WHO, UN Economic Commission for Africa, UN Economic and Statistical Commission for Asia and the Pacific. The team also collaborates with CDC offices in countries where we work and with other CDC programs and initiatives, including the Global Immunizations Division, Division for Global HIV/TB (PEPFAR), the Division of Reproductive Health, and the Child Health and Mortality Preventions Surveillance (CHAMPS) initiative.

Proposed Surveillance Project:

This project will evaluate the mortality surveillance system in Lusaka, Zambia, where efforts are currently underway by the CDC Zambia office to strengthen HIV mortality and case-based surveillance. Creating a model for other country systems, this surveillance evaluation will consider inputs from both civil registration and surveillance mechanisms, and it will demonstrate how use of information from both mechanisms can be optimized. The evaluation will include a desk review of the system as well as country travel with stakeholder interviews and workshops to map and understand system processes, strengths, and weaknesses; if feasible, a review of medical certificate of cause of death data from health facilities and/or verbal autopsy data from community deaths.

Current Position Data:

Much of our analytic and technical support for data analysis takes place in the field, in the countries that we support. While ownership of vital statistics data remains with the foreign governments that we support, we have data sharing agreements that provide access to such data from collaborating countries. We also have qualitative data from verbal autopsy cognitive testing that was supported by NCHS's Collaborating Center for Questionnaire Design and Evaluation Research, along with U.S. mortality data and other data from NCHS's Division of Vital Statistics. Mortality data from the Bill and Melinda Gates Foundation-funded CHAMPS initiative is also available.

Position Strengths: Collaboration with major international partners/initiatives (e.g., WHO, UNICEF, UNECA, country governments, and PEPFAR) and world experts in CRVS and mortality statistics; ideal combination of field and analytic experience; opportunity for autonomy and creative additions to selected projects; support and encouragement to publish findings and contribute to technical guidance.

Staff & Resources: The Global CRVS Team is comprised of five dedicated staff members with decades of global health experience collectively, with specific expertise in field epidemiology, demography, reproductive health, public health surveillance, and verbal autopsy. The EISO will have direct access to NCHS's wealth of knowledge and expertise in survey methodology, analysis, and graphical support. Additional CRVS support is available from NCHS's Division of Vital Statistics; partners at WHO, UNICEF, and the UN Statistics Division; and other international collaborators. Work of the Global CRVS Team is supported by Bloomberg Philanthropies Data for Health Initiative (https://www.bloomberg.org/program/public-health/data-health/).

Special Skills Useful for this Position: Required: flexibility for travel; proactive; strong written and oral communication skills

Ideal, but not required: international experience in health data collection or related areas; foreign language skills (particularly French or Arabic)

Domestic Travel: 5% **International Travel:** 25%

National Center for Injury Prevention and Control

Injuries, drug overdose, and violence kill close to ¼ of a million people each year. Millions more are injured each year and survive. Deaths from opioids continue to rise, leading the Present to declare it a national emergency. The National Center for Injury Prevention and Control (NCIPC) offers exciting opportunities, to study violence, drug overdose, and injury prevention. EISOs will conduct epidemiologic investigations and research the best ways to prevent violence and injury (including drug overdose), applying science for real- world solutions to keep people safe, healthy, and productive. NCIPC consists of 3 divisions. Unintentional Injury Prevention focuses on major contributors to injury mortality, morbidity and disability including opioid overdose, motor vehicle crashes, falls, and traumatic brain injury. Violence Prevention applies science to prevent child abuse and neglect, youth violence, sexual violence, intimate partner violence and suicide. Analysis, Research and Practice Integration focuses on cross-cutting areas including statistics, surveillance, economic and program evaluation and technical assistance to state programs.

NCIPC-DUIP-HSTSB-Georgia-2019-01

Primary Supervisor: Christina Mikosz, Medical Officer, EIS 2011

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Secondary Supervisor(s):

- Debbie Dowell, Chief Medical Officer, EIS 2007
- Gery Guy, Senior Health Economist

Background: The opioid overdose epidemic represents a national crisis. Since 1999, drug overdose deaths have been increasing, with 70,237 deaths in 2017, leading to a decrease in U.S. life expectancy not seen in a century. Opioid-involved deaths in 2017 accounted for over two-thirds of overdose deaths. This evolving epidemic has occurred in three waves with increases in prescription opioid overdose deaths in 1999, heroin deaths in 2010, and synthetic opioid deaths (primarily illicitly-manufactured fentanyl) in 2013. Addressing this epidemic is a priority for CDC. The EISO would be assigned to the Opioid Overdose Health Systems Team within the Health Systems/Trauma Systems Branch, Division of Unintentional Injury Prevention. Within CDC's Division focusing on opioid overdose activities, the branch works to improve data quality and track trends to monitor the overdose epidemic; strengthen state efforts by scaling up effective public health interventions; and supply healthcare providers with data and guidance for evidence-based decision-making to change how opioids are prescribed. This last grouping of clinically-related branch activities is the focus of the Health Systems Team. The EISO will also work closely with the Opioid Response Coordinating Unit (ORCU), which oversees cross-cutting opioid-related work across the entire agency.

Current Work: Analysis of opioid prescribing histories of unintentional fentanyl- and heroin-related overdose deaths; analysis of overdose mortality resulting from combined use of synthetic opioids and other substances; Epi-Aid investigating opioid use and neonatal abstinence syndrome in Native Americans; Epi-Aids examining increases in fentanyl-related overdose deaths in Ohio, Massachusetts, and Rhode Island.

Proposed Initial Projects: Immediately upon arrival, the EISO will have the opportunity to begin an analytic project examining some aspect of opioid prescribing, as directed by the EISO's interest and branch needs. Possibilities may include: 1) evolving trends in the use of opioids for acute pain; 2) patient-level risk factors and comorbidities and their relationship with adverse outcomes of opioid use; 3) trends in opioid prescribing by clinical setting. A project addressing CAL 11 (the "lay audience CAL"?) can likely be begun upon arrival, as our team is highly involved in work translating the recommendations in the CDC opioid prescribing guideline to stakeholders.

Proposed Analytic Project:

The Health Systems Team leads research on opioid prescribing trends and the evaluation of the implementation of the 2016 CDC Guideline for Prescribing Opioids for Chronic Pain (the first evidence-based clinical practice guideline for opioid treatment of chronic pain conditions in primary care settings). Commonly-used and readily available datasets for our research include: pharmaceutical and medical insurance claims data like Marketscan and Optum; pharmacy data like IQVIA; hospitalization and emergency department data from the Healthcare Cost and Utilization Project (HCUP); and data from the National Survey on Drug Use and Health (NSDUH), to name a few. Thus, the EISO will be very well-positioned to conduct nuanced analyses of various aspects of opioid prescribing and associated outcomes including overdose and/or opioid use disorder. The specific analytic questions and methods used will be tailored to the interests of the officer, but might include variable cluster analysis to further analyze the relationship of patient-level factors and opioid harms, or interrupted time-series analysis to investigate the impact of policies and interventions on opioid prescribing practices over time. Additionally, there will be opportunities for collaboration with the branch's Epi/Surveillance Team, which uses data from the National Vital Statistics System to study mortality trends and oversees CDC's Enhanced State Opioid Overdose Surveillance (ESOOS) collecting state-level data on fatal and nonfatal opioid and other drug overdoses, among many other activities.

Proposed Field Investigation Project:

This position offers extensive potential opportunities for state, local, and/or tribal community field work. For example, our branch provides funding for all 50 states and the District of Columbia to support community-level opioid overdose prevention efforts. These efforts include enhancement of state fatal and nonfatal drug overdose surveillance capacity. A new funding opportunity to support overdose surveillance and prevention in tribal communities will expand field opportunities still further. Additionally, the Opioid Response Coordinating Unit -- the program coordinating the CDC-wide cross-cutting opioid crisis response efforts -- is based within our Center, and their newly-launched Opioid Rapid Response Teams are anticipated to provide opportunities to assist with community-level emergency response activities and fieldwork related to 1) identifying and addressing overdose clusters and 2) providing linkages to clinical care following pain clinic closures. Also, our branch has led or supported several Epi-Aids in the past related to fentanyl overdoses or neonatal abstinence syndrome (neonatal opioid withdrawal syndrome). If an Epi-Aid opportunity arises during the EISO's tenure, we would support and encourage participation in a lead role. Lastly, as the opioid overdose epidemic has not only led to a dramatic increase in overdose-related deaths but also become intertwined with many other health issues -- such as increases in infectious disease transmission -- we would fully support and encourage the EISO to participate in any opioid-related outbreak investigations initiated by other divisions if time and interest permit (e.g., Division of HIV/AIDS Prevention or Division of Viral Hepatitis).

Opioid overdose prevention is a high-level CDC and HHS priority activity, and as the lead branch for CDC's opioid overdose activities, our program is rich with federal, state, tribal, and local community collaborative opportunities that the EISO may participate in, depending on interest. Nearly all 50 states receive CDC funding to support opioid overdose prevention activities, for which the EISO may be able to provide technical assistance across a range of scientific activities. Also, our branch is rapidly expanding efforts to support tribal community overdose interventions, another potential avenue for collaborative work. Additionally, branch staff participate in multiple federal workgroups spanning a broad range of overdose-related activities, which may provide an opportunity for the EISO to gain experience in close collaboration with federal partners.

Proposed Surveillance Project:

A few options for surveillance evaluations include:

1) The New York City Department of Health and Mental Hygiene (NYCDOHMH) recently launched a program that dispatches workers to meet with opioid overdose survivors at NYC emergency departments to connect survivors to appropriate supportive services. This initiative serves many needs in overdose prevention, including linkage to clinical care, but importantly can augment data about nonfatal overdoses detected via standard syndromic surveillance methods, as cases identified for outreach are cross-checked against NYC syndromic surveillance data, thus serving as a "real world" check on the utility of NYC's syndromic surveillance case definitions. The EISO, in partnership with the NYCDOHMH, could evaluate this program's effectiveness as a surveillance system.

The EISO could potentially accompany field workers to better understand the process involved in this outreach program.

2) The NAVIPPRO (National Addictions Vigilance Intervention and Prevention Program) surveillance system captures Addiction Severity Index information on patients receiving or being screened for substance use treatment. This system captures route of use for all reported substances, and detailed demographic, legal, employment/financial, housing, psychiatric, substance use, and medical care utilization information. The EISO would evaluate this surveillance system's value in capturing patterns of substance use among individuals seeking substance abuse treatment, trends in poly-substance use, and use of substance abuse treatment. CDC may be interested in adding to this system questions related to emerging substances, which may provide opportunities not only for engagement with workers in the field but also for implementing evaluation results to the NAVIPPRO system.

Current Position Data:

Datasets readily available to the EISO include: pharmaceutical and medical insurance claims data like Marketscan and Optum; pharmacy data like IQVIA; hospitalization and emergency department data from the Healthcare Cost and Utilization Project (HCUP); data from the National Survey on Drug Use and Health (NSDUH); substance use data from NAVIPPRO; and data from the National Ambulatory Medical Care Survey (NAMCS).

Position Strengths: Addressing the opioid overdose epidemic is a top CDC and HHS priority, with increased federal spending and high visibility aimed at improving surveillance and public health response at the national, state, and local levels. Despite our fast-paced, high-profile work, we are an extremely collegial group with an open-door policy and deep commitment to collaborative work. There are numerous opportunities for EISOs to explore their own interests in overdose prevention and to seek specific projects to develop their individualized skill set. The primary and secondary supervisors, as well as the consultants, are highly committed to supporting the EISO's training experience.

Staff & Resources: Our diverse branch is comprised of collegial, highly-trained staff offering a broad range of expertise, including doctoral-level epidemiologists, medical officers, health economists, biostatisticians, health scientists, and communications and policy staff. We also support several trainees in other CDC fellowship programs. Our team has a highly productive health services research focus, and statistical and programming support is readily available. Cross-collaboration occurs regularly and is encouraged. Primary and secondary supervisors, consultants, and Division and Center leadership are committed to supporting EISOs. Despite our branch's rapid growth, leadership at all levels in our Center is approachable and accessible with an open-door policy.

Special Skills Useful for this Position: Special skills useful for this EISO position are the ability to work in a fast-paced environment on high-profile projects; good communication skills; and a high level of enthusiasm. Strong analytic skills using SAS, STATA, and Excel are helpful, but statistical support is easily available. Clinical knowledge and experience is a definite plus but not required.

Domestic Travel: 10% **International Travel:** 0%

NCIPC-DVS-SB-Georgia-2019-01

Primary Supervisor: Shane Jack, Behavioral Scientist, EIS 2007

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Secondary Supervisor(s):

- Marissa Zwald, Epidemiologist, EIS 2016
- Katherine Fowler, Senior Scientist, EIS 2011

Background: The Division of Violence Prevention (DVP) is the largest organization in the world addressing violence as a public health problem. It has been at the forefront of establishing the public health approach to

violence prevention within the United States and abroad. DVP addresses prevention of youth violence, suicidal behavior, child abuse and neglect, sexual violence, intimate partner violence, and elder abuse. These different forms of violence are interconnected and often share similar root causes. Understanding the overlapping causes of violence and the things that protect people and communities can help prevent violence in all forms. DVP's Surveillance Branch leads multiple nationally representative surveys and data systems that are critical to monitoring the incidence of violence, identifying vulnerable groups, and guiding and evaluating local/state/national prevention strategies. The Branch also provides expert consultation to local/state/national/international health agencies on surveillance system design, implementation, and use of surveillance data to describe the burden of violence. Previous EISOs were actively involved in responses to numerous violence-related topics: firearm violence in Delaware; youth suicide in New York, Utah, and among American Indian/Alaska native; physical and sexual violence investigations of children in Tanzania, Swaziland, and Haiti; gender-based violence in Belize; and 2002 sniper attacks in Washington, DC.

Current Work: Recent fieldwork included investigations of suicide clusters, firearm violence, and opioid overdose. Officers trained data collectors for violence surveys and supported data-to-action workshops in multiple countries. Analytic projects included suicide among vulnerable populations (e.g., homeless, LGBT youth, evicted/foreclosed persons), abusive head trauma, and global child abuse and sexual/intimate partner violence.

Proposed Initial Projects: The EISO's initial work will be to identify the scope of the surveillance project, learn about the available data systems, and meet and discuss with supervisors training needs and interests. Several established surveillance systems are available to allow the EISO to rapidly begin the surveillance project. Supervisors have prepared potential projects that an officer can choose from (e.g., using CDC guidelines for evaluating public health surveillance systems to assess the National Violent Death Reporting System) or the officer can develop projects that align with his/her interests. This will be a flexible process and tailored to the needs of the officer.

Proposed Analytic Project:

Supervisors will work with EISO to develop the most relevant projects based on the officer's interests. Analytic projects can use data from various large datasets maintained by DVP that collect violence-related outcomes. For example: 1) Examining characteristics of homicide, suicide, legal intervention, unintentional firearm deaths and/or deaths of undetermined intent from death certificates, coroner/medical examiner and law enforcement through the National Violent Death Reporting System (NVDRS); 2) Examining patterns of intimate partner and sexual violence using the National Intimate Partner and Sexual Violence Survey (NISVS); 3) Examining factors associated with youth suicide using NVDRS; 4) Examining trends in nonfatal violence-related injuries using syndromic surveillance data and/or data from the National Electronic Injury Surveillance System -- All Injury Program (NEISS-AIP); and 5) Examining risk and protective factors associated with violence against children and youth in low- and middle-income countries using Violence Against Children Survey (VACS) data. Opportunities exist for analytic projects to extend beyond descriptive epidemiology and into analytic epidemiology, employing methods such as multivariate or time-series modeling and geographic information system (GIS) mapping technology. For example, advanced analytic projects could include conducting multivariate analysis to examine risk and protective factors associated with sexual violence victimization using NISVS data, or investigating spatial relationships associated with emergency department visits for nonfatal violence-related injuries using syndromic surveillance data. There are also opportunities to work on other health topics that overlap with violence (e.g. opioid use, cancer, reproductive health). Analytic projects will primarily involve data analysis of ongoing projects with established protocols.

Proposed Field Investigation Project:

The EISO will have multiple opportunities to lead and be part of a team to collect, analyze, and publish from field, primary data collection projects. For example, DVP EISOs typically lead one violence-related field investigation (e.g., Epi-Aid). Involvement in additional field investigations are available based on an EISO's interests. Previous DVP EISOs have led or been a team member on multiple Epi-Aids for violence (e.g., suicide, violence against youth, homicide, adverse childhood experiences, intimate partner violence) and other public health topics (e.g., Fentanyl-related overdose, HIV risk, reproductive health). Past field investigations have included domestic (e.g., tribal, county, state level) and global opportunities. Leadership or team membership of

an Epi Aid provides the EISO an opportunity to establish and coordinate work with partners (e.g., mayor, tribal leadership, law enforcement, public health leader, schools, nongovernmental organizations), collect data from multiple sources (e.g., online and in-person surveys, interviews, medical or school chart reviews, media scans), analyze data, develop prevention recommendations, and present findings through conferences, reports, and peer reviewed publications. Previous DVP EISOs have also participated in emergency response deployments (e.g., Zika, Ebola, hurricane, earthquake).

The EISO will be a part of a team that works closely with domestic partners, including funded state and local health departments in addition to federal partners (e.g., National Syndromic Surveillance Program) to monitor violence, identify vulnerable populations and risk/protective factors, and use the data to determine strategies to prevent violence and associated health outcomes. The officer will primarily interact with these public health partners through field investigations or Epi-Aids, and through their surveillance system evaluation CAL. Examples of recent surveillance system evaluation collaborations with public health partners that were led by DVP EISOs included strategies to improve the timeliness of data of the Rhode Island Violent Death Reporting System (VDRS), comparison of medical examiner and police report data sources in the Utah VDRS to improve partnerships and data completeness, and examination of the use and potential benefits of the child abuse and neglect module by states participating in CDC's National Violent Death Reporting System. Past EISOs have conducted site visits to a collaborating state health department to conduct interviews as part of their surveillance system evaluation. Opportunities also exist to engage with state and local health departments to provide epidemiological and other technical assistance and to collaborate with academic partners at funded Injury Control Research Centers on analytic projects.

Proposed Surveillance Project:

The EISO will have the opportunity to conduct a surveillance evaluation for one of the following systems: National Violent Death Reporting System (NVDRS; a system for recording details of all violent deaths in participating states); the National Intimate Partner and Sexual Violence Survey (NISVS; a national telephone survey on physical and sexual violence, psychological aggression, coercive control, and stalking); the Behavioral Risk Factor Surveillance System (BRFSS; a national telephone survey on health conditions and risk behaviors); or National Syndromic Surveillance Program (NSSP; syndromic data from emergency departments, urgent care, ambulatory care, and pharmacies, including violence-related data). Recent surveillance projects conducted by EISOs have resulted in improvements of detection of violent deaths in one state's Violent Death Reporting System, as well as the improvements to a case definition for nonfatal suicidal behavior in emergency department visits. Supervisors will work with the EISO to develop and select the most relevant project based on the officer's interests. Depending on the project and surveillance system chosen, the evaluation could involve either desk-based work at CDC headquarters or site visit(s). Evaluation of NISVS, BRFSS, and NSSP could include input from state and national partners obtained through in-person, phone, and/or internet-based information collection approaches. Evaluations of NVDRS could use a combination of approaches, including site visits.

Current Position Data:

The following are accessible and available within the first month of assignment: 1) National Violent Death Reporting System: collects violent death data (e.g., homicides and suicides) pooled from multiple sources; 2) National Intimate Partner and Sexual Violence Survey: collects intimate partner violence, sexual violence and stalking victimization data; 3) Violence Against Children Surveys: internationally-based household survey that collects emotional, physical, and sexual violence data; 4) National Syndromic Surveillance Program data: used for the early detection of multiple conditions (e.g., suicide attempts, drug overdoses) and events. Other available datasets: Behavioral Risk Factor Surveillance System; Add Health; National Electronic Injury Surveillance System.

Position Strengths: The position offers opportunities to apply epidemiologic techniques in creative ways to determine strategies to prevent violence, which is a leading cause of death and associated almost all other public health issues. The EISO will work with a diverse group of professionals and agencies and be part of a team with vast experience in epidemiology and behavioral science. Activities can be tailored to EISO interests, if desired. Deployments for international emergency response or work in CDC's Emergency Operations Center are

possible. Additionally, several former EISOs work within the division providing opportunities for the incoming officer to benefit from their expertise.
Staff & Resources: Numerous staff of doctoral level epidemiologists, behavioral scientists, medical officers, and over 15 EIS alumni work in the Division of Violence Prevention (DVP). EISO will have access to staff with extensive content and analytic expertise related to violence prevention. The DVP environment is collegial and collaborative in nature, which will allow for ready access to resources. Computer, statistical, and clerical support is available, including the NCIPC's Statistics, Programming and Economics Branch. The position's EISO supervisors are experienced and productive scientists.
Special Skills Useful for this Position: The ideal EISO is creative, hardworking, a strong communicator, and interested in quantitative and qualitative analyses. Experience with SAS, SPSS, or other statistical languages is a plus, but not required. Candidates should have a willingness to work in the field of violence prevention and skills to work with people from diverse personal and professional backgrounds.
Domestic Travel: 10% **International Travel:** 10%

National Center for Immunization and Respiratory Diseases

The National Center for Immunization and Respiratory Diseases (NCIRD) offers exciting opportunities to work with experienced mentors conducting outbreak investigations, surveillance projects, analytic projects, working internationally, experience with policy development and publishing scientific articles. We work on a wide variety of important diseases and pathogens including influenza, pertussis, meningitis, pneumococcus, norovirus, rotavirus, coronavirus, measles, mumps, and acute flaccid myelitis (AFM). NCIRD EIS officers have played critical roles in many high visibility investigations including measles, the Influenza A H1N1 pandemic, adenovirus, AFM, meningitis outbreaks, and MERS coronavirus. Our officers have the opportunity to lead presentations for the Advisory Committee on Immunization Practices (ACIP), and conduct vaccine safety work. We foster a collaborative and welcoming environment for our EISOs and adapt our bi-weekly seminar series to officer interests. Officers in our center are sought after for their expertise in outbreak investigation, experience collaborating with jurisdictional health departments, and leadership skills.

NCIRD-DBD-RDB-Georgia-2019-01

Primary Supervisor: Fernanda Lessa, Medical epidemiologist, EIS 2006

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Secondary Supervisor(s):

- Melissa Arvay, Epidemiologist

Background: The Respiratory Diseases Branch (RDB) focuses on prevention and control of community-acquired bacterial respiratory and neonatal infections, both domestically and internationally. Primary pathogens include Streptococcus pneumoniae, Streptococcus pyogenes (group A Streptococcus--GAS), group B Streptococcus--GBS, and respiratory Chlamydia, Legionella, and Mycoplasma species. RDB strives to make public health impact through: outbreak investigations, design and coordination of national and international surveillance systems, identification of risk factors for disease, and development and evaluation of disease prevention and control strategies. Examples of RDB's work include: assessing current US pneumococcal vaccine policies, supporting future vaccine developments (GAS, GBS), assisting global efforts to accelerate introduction of new vaccines to low- and middle-income countries, providing guidance on and assistance with Legionnaires' disease prevention, and evaluating guidelines to prevent perinatal GBS disease and the global need for a maternal GBS vaccine. RDB's laboratory teams provide strong support for epidemiologic activities; with the advent of whole genome sequencing, novel epidemiologic analyses and field opportunities are now available.
Excellent collaborative relationships exist with medical professional societies, academic institutions, and the units at CDC that focus on global health, immunizations, antimicrobial resistance, healthcare-associated infections, chronic diseases, viral respiratory diseases, and reproductive health.
Current Work: -Conducted pneumococcal carriage studies in Ghana, Indonesia, and Kenya
-Investigated the scope of invasive group A Streptococcus disease in long-term care facilities in Colorado
-Estimated the US burden and healthcare utilization for pneumococcal disease
-Evaluated direct and indirect effects of PCV13 on US pneumonia hospitalizations using hospital administrative data
Proposed Initial Projects: - Analyze whole-genome sequencing and accompanying epidemiological data of group B Streptococcus (GBS) isolates to characterize factors associated with mortality from invasive GBS infection.
- Describe the changes in antibiotic-resistant invasive pneumococcal disease in the era of 13-valent pneumococcal conjugate vaccine.
- Examine psittacosis surveillance through National Notifiable Diseases Surveillance System (NNDSS) and its utility in monitoring disease trends and the impact of changing case definitions.

Proposed Analytic Project:

EISOs will have access to data from the Active Bacterial Core surveillance (ABCs)""an active, population- and laboratory-based surveillance system, tracking select invasive bacterial infections in geographically diverse areas in the United States. Disease information is captured from nearly 40 million people. ABCs provides a unique infrastructure for public health research, such as special studies to identify risk factors for disease, post-licensure vaccine efficacy evaluations, and analyses to monitor the effectiveness of disease prevention policies. Additionally, officers may have opportunities to analyze data collected through our international projects to characterize risk factors for disease and effectiveness of disease interventions, such as vaccines. Substantial time developing protocols will not be required. Currently proposed project include:

- Analyzing whole-genome sequencing and accompanying epidemiological data of group B Streptococcus (GBS) isolates to characterize factors associated with mortality from invasive GBS infection. The analysis will include multivariable analysis.

o This cutting edge analysis integrates ready to go epidemiologic and laboratory data from 2015-2017. The EISO will conduct a multivariable analysis assessing epi factors associated with mortality, separately for infants and adults, and then will partner with a laboratory expert to harness bioinformatics data to characterize strain factors associated with mortality.

- Describing the changes in antibiotic-resistant invasive pneumococcal disease in the era of 13-valent pneumococcal conjugate vaccine

o This analysis integrates epidemiologic and laboratory data, including whole genome sequencing data, on invasive pneumococcal disease from ABCs to describe impact of pneumococcal vaccine introduction on antibiotic resistant strains

Proposed Field Investigation Project:

During the two years, most EISOs will have several opportunities to participate in Epi-Aids to fulfill their Field Investigation CAL. Current and recent EISOs have each participated in 2--4 Epi-Aids, and examples are listed below. EISOs will also have an opportunity to participate in an international project involving primary data collection. In these projects, officers will work closely with partners in-country, such as the CDC office in-country, Ministry of Health, or partnering institutions.

ï,- Investigated invasive group A Streptococcus (GAS) infections among homeless adults in Anchorage, Alaska

ï,- Investigated Legionnaires' disease clusters at two large healthcare facilities

ï,- Assisted in an outbreak investigation of Legionnaires' disease in a veterans' home in Illinois

ï,- Investigated and analyzed IV drug use among persons with invasive GAS infections as reported to Active Bacterial Core surveillance ABCs

EISOs will be expected to lead at least one Epi-Aid, in which officers will be the main point of contact for the state or local public health partners. EISOs work closely with public health partners to plan the investigation, conduct data collection and analysis, and develop follow-up plans. Additionally, EISOs will have opportunities to work on projects that involves on-site and off-site technical assistance to public health partners, such as participating in training or assisting with project implementation. Depending on the nature of the project and the comfort level of the EISO, officers may take a lead role in these activities. Examples from the recent years include the following:

ï,- Provided technical assistance to 2 US hospitals to create a group B Streptococcus clinical decision support tool

ï,- Provided technical assistance to the Guatemalan Ministry of Health on acute response capacity for respiratory outbreaks

ï,- Assisted in protocol development, study design, and implementation of a pneumococcal carriage survey in Ghana to inform national vaccination schedule for the 13-valent pneumococcal conjugate vaccine

ï,- Provided technical assistance to ongoing meningitis surveillance in Haiti

Potential opportunities for incoming EISOs are:

- Evaluate changes in vaccine-type pneumococcal nasopharyngeal colonization among children < 5 years of age hospitalized with suspected pneumonia in Mozambique.
- Contribute to development of guidance for the public health response to pneumococcal disease outbreaks.

Proposed Surveillance Project:

- Examine psittacosis surveillance through National Notifiable Diseases Surveillance System (NNDSS) and its utility in monitoring disease trends and the impact of changing case definitions. In September 2018, CDC was notified of a respiratory illness outbreak among chicken slaughter plant workers at one company's facilities in two states. This outbreak was the largest psittacosis outbreak reported in U.S. chicken slaughter plants in the past three decades. Despite this investigation, many questions remain unanswered given the limited information that is currently available on psittacosis. Psittacosis is a nationally notifiable disease under NNDSS; however, because of diagnostic challenges, underdiagnosis is likely, and very limited information is available on reported psittacosis cases. Currently, psittacosis surveillance is undergoing enhancement as part of the NNDSS Modernization Initiative (NMI), which provides an opportunity to improve our understanding on psittacosis. EISOs will assess how illnesses are currently reported to NNDSS, and how NMI may improve the utility of NNDSS data for disease monitoring and intervention. This will be an Atlanta-based project.

Current Position Data:

Active Bacterial Core surveillance; Nationally Notifiable Disease Surveillance System; Supplemental Legionnaires' Disease Surveillance System

Position Strengths: Tradition of providing balanced, rigorous training, including a mix of pathogens that impact all age groups, domestic and global activities, outbreaks that involve both environmental and person-to-person transmission, well-established surveillance systems, prevention activities (e.g. vaccines, environmental remediation), other interventions (e.g. antibiotics) and health communications with support from EIS-trained epidemiologists and statisticians. Besides having immediate impact through recommendations provided during outbreak investigations, officers have also had the opportunity to impact policies through involvement with the Advisory Committee of Immunization Practices (ACIP). We have several "ready to go" activities allowing for completion within 2 years.

Staff & Resources: A collaborative 30-member Epidemiology Team with a tradition of well-rounded and successful EIS training. The group includes10 senior epidemiologists who are passionate about tackling public health issues in their area of expertise both domestically and internationally, and 5 knowledgeable and supportive statisticians dedicated to the team. Weekly team meetings and RDB EIS orientation lectures help officers learn about the various public health topics that our group covers.

Special Skills Useful for this Position: Interest, motivation, and a willingness to ask questions as needed are the most important skills. Prior experience in infectious disease, research, scientific writing, and data analysis can be helpful, but are not necessary. Foreign language skills (Spanish, French, and Portuguese, in particular) can also be helpful. Flexibility regarding travel is important. Willingness to assist with outbreaks as needed over the course of the 2 years.

Domestic Travel: 10% **International Travel:** 10%

NCIRD-DBD-RDB-Georgia-2019-02

Primary Supervisor: Chris Edens, Epidemiologist, EIS 2014

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Secondary Supervisor(s):

- Chris Van Beneden, Medical Officer, EIS 1995
- Tamara Pilishvili, Epidemiologist

Background: The Respiratory Diseases Branch (RDB) focuses on prevention and control of community-acquired bacterial respiratory and neonatal infections, both domestically and internationally. Primary pathogens include Streptococcus pneumoniae, Streptococcus pyogenes (group A Streptococcus--GAS), group B Streptococcus--GBS, and respiratory Chlamydia, Legionella, and Mycoplasma species. RDB strives to make public health impact through: outbreak investigations, design and coordination of national and international surveillance systems, identification of risk factors for disease, and development and evaluation of disease prevention and control strategies. Examples of RDB's work include: assessing current US pneumococcal vaccine policies, supporting future vaccine developments (GAS, GBS), assisting global efforts to accelerate introduction of new vaccines to low- and middle-income countries, providing guidance on and assistance with Legionnaires' disease prevention, and evaluating guidelines to prevent perinatal GBS disease and the global need for a maternal GBS vaccine. RDB's laboratory teams provide strong support for epidemiologic activities; with the advent of whole genome sequencing, novel epidemiologic analyses and field opportunities are now available.

Excellent collaborative relationships exist with medical professional societies, academic institutions, and the units at CDC that focus on global health, immunizations, antimicrobial resistance, healthcare-associated infections, chronic diseases, viral respiratory diseases, and reproductive health.
Current Work: -Conducted pneumococcal carriage studies in Ghana (2018), Indonesia (2017), and Kenya (2017)
-Investigated invasive group A Streptococcus disease in long-term care facilities in Colorado (2019)
-Estimated the US burden and healthcare utilization for pneumococcal disease
-Evaluated direct and indirect effects of PCV13 on US pneumonia hospitalizations using hospital administrative data
Proposed Initial Projects: - Describe the epidemiology of invasive early-onset neonatal sepsis and perform a multivariable analysis to describe factors associated with deaths using Active Bacterial Core surveillance (ABCs) dataset.
- Investigate the possible association of extreme weather events and Legionnaires' disease using data from the Nationally Notifiable Diseases Surveillance System (NNDSS).
- Examine invasive pneumococcal disease (IPD) surveillance through National Notifiable Diseases Surveillance System (NNDSS) and its utility to establish disease burden and the impact of changing case definitions.

Proposed Analytic Project:
Describe the epidemiology of invasive early-onset neonatal sepsis and perform a multivariable analysis to describe factors associated with deaths using Active Bacterial Core surveillance (ABCs) dataset.
- ABCs is an active, population- and laboratory-based surveillance system, tracking select invasive bacterial infections in geographically diverse areas in the United States. For this project, data from 2015--2018 will be available for analysis, encompassing one of the largest early-onset sepsis case series in recent years. The data include a rich set of variables from the labor and delivery record, as well as the infant hospitalization, and will allow for a nuanced analysis of trends over time, case characteristics and factors associated with mortality. Substantial time developing protocols will not be required.

Investigate the possible association of extreme weather events and Legionnaires' disease using data from the Nationally Notifiable Diseases Surveillance System (NNDSS).
- Data from the NNDSS, encompassing more than 30 years of case reporting, will be used to better understand the impact of extreme weather events on Legionnaires' disease rates. Hurricanes, tornados, floods, and other extreme weather events can result in damage to water systems, a known risk factor for Legionnaires' disease cases and outbreaks. This analysis will utilize county-level case data to determine if these events impact rates of disease over time. This activity will combine case data with weather data from a second data source (e.g., Federal Emergency Management Agency, National Oceanic and Atmospheric Administration) for a more complex analysis. Substantial time developing protocols will not be required.
Proposed Field Investigation Project:
During the two years, most EISOs will have several opportunities to participate in Epi-Aids to fulfill their Field

Investigation CAL. Current and recent EISOs have each participated in 2--4 Epi-Aids, and examples are listed below. EISOs will also have an opportunity to participate in an international project involving primary data collection. In these projects, officers will work closely with partners in-country, such as the CDC office in-country, Ministry of Health, or partnering institutions.
- Investigated invasive group A Streptococcus (GAS) infections among homeless adults in Anchorage, Alaska
- Investigated Legionnaires' disease clusters at two large healthcare facilities
- Assisted in an outbreak investigation of Legionnaires' disease in a veterans' home in Illinois
- Investigated and analyzed IV drug use among persons with invasive GAS infections as reported to Active Bacterial Core surveillance (ABCs)

EISOs will be expected to lead at least one Epi-Aid, in which officers will be the main point of contact for the state or local public health partners. EISOs work closely with public health partners to plan the investigation, conduct data collection and analysis, and develop follow-up plans. Additionally, EISOs will have opportunities to work on projects that involve on-site and off-site technical assistance to public health partners, such as participating in training or assisting with project implementation. Depending on the nature of the project and the comfort level of the EISO, officers may take a lead role in these activities. Examples from the recent years include the following:
- Provided technical assistance to two US hospitals to create a group B Streptococcus clinical decision support tool
- Provided technical assistance to the Guatemalan Ministry of Health on acute response capacity for respiratory outbreaks
- Assisted in protocol development, study design, and implementation of a pneumococcal carriage survey in Ghana to inform national vaccination schedule for the 13-valent pneumococcal conjugate vaccine
- Provided technical assistance to ongoing meningitis surveillance in Haiti

Potential opportunities for incoming EISOs are:
- Assist with development of a protocol to evaluate pneumococcal colonization among children hospitalized with severe pneumonia in Burkina Faso.
- Contribute to development of guidance for the public health response to group A Streptococcus infections.

Proposed Surveillance Project:
Examine invasive pneumococcal disease (IPD) surveillance through the Nationally Notifiable Diseases Surveillance System (NNDSS) and its utility to establish disease burden and the impact of changing case definitions.
- A representative population-based surveillance system is critical for understanding disease burden, and evaluating impact of public health interventions. Active Bacterial Core surveillance (ABCs) is an active population- and laboratory-based system, which operates in select states and counties in the United States. ABCs has established methods for monitoring the incidence of invasive pneumococcal infections. IPD cases are also reported nationally through NNDSS, a passive surveillance system with a broader catchment of the US population than ABCs. EISO working on this project will be expected to compare the two surveillance systems, ABCs and NNDSS, and assess the utility of the passive system to estimate incidence of disease, measure the impact of vaccine introduction, and document changes in pneumococcal strains causing disease. Additionally, EISO will be expected to assess the impact of how the recent change in the Council of State and Territorial Epidemiologists (CSTE) surveillance case definition, incorporating non-culture-based laboratory diagnostics, might impact IPD incidence estimates. This will be an Atlanta-based project.

Current Position Data:
Active Bacterial Core surveillance; Nationally Notifiable Disease Surveillance System; Supplemental Legionnaires' Disease Surveillance System

Position Strengths: Tradition of providing balanced, rigorous training, including a mix of pathogens that impact all age groups, domestic and global activities, outbreaks that involve both environmental and person-to-person transmission, well-established surveillance systems, prevention activities (e.g. vaccines, environmental remediation), other interventions (e.g. antibiotics) and health communications with support from EIS-trained epidemiologists and statisticians. Besides having immediate impact through recommendations provided during outbreak investigations, officers have also had the opportunity to impact policies through involvement with the Advisory Committee of Immunization Practices (ACIP). We have several "ready to go" activities allowing for completion within 2 years.
Staff & Resources: A collaborative 30-member Epidemiology Team with a tradition of well-rounded and successful EIS training. The group includes 10 senior epidemiologists who are passionate about tackling public health issues in their area of expertise both domestically and internationally, and 5 knowledgeable and supportive statisticians dedicated to the team. Weekly team meetings and RDB EIS orientation lectures help officers learn about the various public health topics that our group covers.
Special Skills Useful for this Position: Interest, motivation, and a willingness to ask questions as needed are the most important skills. Prior experience in infectious disease, research, scientific writing, and data analysis can be helpful, but are not necessary. Foreign language skills (Spanish, French, and Portuguese, in particular) can also be helpful. Flexibility regarding travel is important. Willingness to assist with outbreaks as needed over the course of the 2 years.
Domestic Travel: 10% **International Travel:** 10%

NCIRD-DVD-RVB-Georgia-2019-01

Primary Supervisor: Brian Rha, Medical Officer, EIS 2012

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Secondary Supervisor(s):

- Claire Midgley, Epidemiologist, EIS 2014
- Gayle Langley, Team Lead, RSV Team; Medical Officer, EIS 2006

Background: The Respiratory Viruses Branch (RVB) is responsible for the epidemiology, surveillance, research and program activities for the prevention and control of respiratory viruses and picornaviruses, including respiratory syncytial virus (RSV), non-polio enteroviruses (EV), human metapneumovirus, human adenoviruses, parainfluenza viruses, and human coronaviruses such as Middle East respiratory syndrome coronavirus (MERS-CoV).

RSV is the most common etiology of viral pneumonia in infants and children, and the second most commonly identified cause of pneumonia in elderly persons. There are over 40 vaccines and numerous therapeutics under development to prevent and treat RSV. Non-polio enteroviruses are responsible for 10--20 million symptomatic infections per year and manifest as a variety of clinical syndromes. Recent outbreaks of MERS-CoV and EV-D68 have focused efforts on better understanding the epidemiology and prevention of these emerging infections.

Activities are focused on further describing the burden of disease, including severe illnesses and mortality, as well as seasonality. The position sits within the RSV Team, but the EIS Officer will be given considerable latitude and support in developing investigations tailored to his/her areas of interest. Officers will have the opportunity to conduct epidemiologic evaluations in the United States and internationally with partners.
Current Work: Outbreak investigations: MERS-coronavirus in affected countries; RSV in a neonatal intensive care unit; adenovirus in congregate settings.

Epidemiologic studies/projects: RSV burden estimates using capture-recapture techniques; RSV risk factor assessment of pediatric neurologic conditions and adult cardiopulmonary conditions; RSV seasonality in Kenya; technical assistance support to ACIP regarding future RSV vaccines.

Proposed Initial Projects: The EISO could immediately start the surveillance project and begin work on the analytic project to conduct a multivariable epidemiologic analysis to identify disease risk factors and appropriate population targets (e.g. immunosuppressed populations) for RSV immunizations under development. They could also help to gather the data on the RSV cost analysis project (the proposal has already been written).

Proposed Analytic Project:

1. Describe the molecular epidemiology of RSV A and B infections and use multivariable modeling to determine if there are differences in clinical presentations and outcomes by type; 2. Conduct multivariable epidemiologic analysis to identify disease risk factors and appropriate population targets (e.g. immunosuppressed populations) for RSV immunizations under development; 3. Determine the sensitivity and specificity of case definitions for RSV and other respiratory pathogens using existing surveillance systems; 4. Determine the direct costs of RSV infections among infants and young children; 5. Describe racial disparities in RSV disease burden; 6. Describe RSV disease among pregnant women. All projects listed would be using data already collected (#1-3 and 5) or in the process of being collected (#4). For project #6, some additional data may be collected and the EISO would have the opportunity to provide input into the process and content.

Proposed Field Investigation Project:

RVB covers a variety of viral respiratory pathogens that have the potential for outbreak investigations and primary data collection in the form of Epi-Aids, field investigations and other consultations with local and state health departments. Current EISOs have conducted international field investigations of MERS-CoV and have been involved with domestic outbreaks related to other coronaviruses, enteroviruses, human metapneumovirus, adenovirus, and RSV. Although the officer should be able to fulfill this CAL through RVB activities, we have allowed our officers to be involved with responses outside our Branch, including those for acute flaccid myelitis (AFM) as well as one focused on suicides in Ohio.

The EISO's primary interaction with public health partners will likely be through field investigations and responses to inquiries regarding local outbreaks of viral respiratory diseases. We also interact with state health departments through the Emerging Infections Program (EIP) surveillance activities. The EISO will also have opportunities to interact with academic partners who are the primary leads of adult and pediatric surveillance systems for RSV and other viral respiratory pathogens. Most of the analytic projects would involve engagement with these academic partners.

Proposed Surveillance Project:

The surveillance project would be to evaluate the sensitivity and specificity of the case definition for RSV infections using New Vaccine Surveillance Network (NVSN) data that have already been collected from academic centers. Understanding the sensitivity and specificity of case definitions will be used to inform surveillance methods for capturing RSV disease burden in the United States and other countries. This project will involve interaction with investigators and data managers, and there may be opportunity to visit a surveillance site as well. There will likely be opportunities to present these data at international meetings. An alternative surveillance project would be a comparison of RSV seasonality across different surveillance systems that use different methods and have different target populations. This analysis would be critical for understanding the most appropriate timing of implementing immunizations that are under development.

Current Position Data:

The National Respiratory and Enteric Virus Surveillance System (NREVSS), the National Enterovirus Surveillance System (NESS), the National Adenovirus Type Reporting System (NATRS), the New Vaccine Surveillance Network (NVSN) and Emerging Infections Program RSV activities are coordinated through the Branch. These are ongoing national surveillance systems which generate data to guide activities.

Position Strengths: The EISO will work in a well-supported, friendly, collaborative environment. Colleagues within the branch have an extensive breadth of knowledge and backgrounds, including virology, immunology, pediatric and adult medicine, infectious diseases, veterinary medicine, biostatistics, and epidemiology. This provides ample opportunity for multidisciplinary projects to address important public health issues. The teams

are small and responsible for a wide variety of high-burden and emerging viral pathogens, allowing the EISO to lead critical work.
Staff & Resources: The EISO will work closely with members of the Branch's two epidemiology teams, which includes personnel trained in epidemiology, medicine, virology, veterinary medicine, and biostatistics, and multiple former EISOs. As part of a welcoming and collaborative team, the EISO will be well-supported on each project and be provided with the overall mentorship necessary to succeed in the position. In addition, close collaborations with the Branch's laboratory teams provide strong support for epidemiologic activities and the data analysis team within the Division provides excellent data management and statistical support.
Special Skills Useful for this Position: Ability to successfully complete projects involving diverse partners in sometimes challenging environments; flexibility; humility; enthusiasm.
Domestic Travel: 10% **International Travel:** 10%

NCIRD-DVD-VGB-Georgia-2019-01

Primary Supervisor: Aron Hall, Team Lead, EIS 2006

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Secondary Supervisor(s):

- Jacqueline Tate, Team Lead, EIS 2006
- Umesh Parashar, Branch Chief, EIS 1996

Background: The Branch is responsible for epidemiology, surveillance, research, and program activities for prevention and control of gastroenteritis associated with rotavirus and norovirus, as well as other enteric viruses. Rotavirus is the leading cause of severe childhood gastroenteritis worldwide, estimated to cause more than 215,000 deaths each year. New rotavirus vaccines have recently been introduced for routine immunization of young children in many countries, including the United States. The Branch is actively engaged with domestic and international partners in the first evaluations of the post-licensure effectiveness and safety of these vaccines in routine programmatic use and to generate data to accelerate the introduction and use of these vaccines globally. Noroviruses are the most common cause of epidemic gastroenteritis and foodborne disease worldwide, and a major contributor to endemic gastroenteritis across the age spectrum. Norovirus vaccines are currently in the development pipeline, providing an opportunity to develop formative disease burden estimates to guide potential targeting of these candidate vaccines. The Branch assists with norovirus outbreak investigations, coordinates national and international surveillance platforms, identifies risk factors for disease, and develops and evaluates prevention and control strategies for these infections.
Current Work: 1) Assessing impact and effectiveness of rotavirus vaccines in the United States and in early introducer countries in Africa, Asia, and Europe.
2) Assessing safety of rotavirus vaccines with respect to intussusception worldwide.
3) Assessing burden of norovirus disease and potential value of vaccines in the United States and worldwide.
Proposed Initial Projects: The surveillance evaluation will likely be the initial project for the officer due to the time sensitivities of this required activity. A complete description of this proposed project is given above. Additionally, potential field deployment to support rotavirus vaccine evaluations may also occur during the first months of the assignment, depending on specific needs at that time.
Proposed Analytic Project:
1) Analyze national and state data on diarrhea and rotavirus-associated hospitalizations and outpatient visits to monitor impact of rotavirus vaccine introduction in the United States
2) Conduct analyses of national databases and existing domestic and international surveillance platforms, including use of time-series modeling, to better characterize the disease and economic burden of norovirus

3) Analyze surveillance data on viral gastroenteritis outbreaks, including multivariate analysis of genotypic and epidemiologic data, to identify appropriate targets for intervention

4) Develop and conduct studies to determine the risk factors for severe outcomes (including hospitalization and death) from norovirus in vulnerable populations

Proposed Field Investigation Project:

Primary data collection within the Branch occurs predominantly through domestic and international implementing partners. The officer will have opportunity to assist in the collection and analysis of data from domestic surveillance platforms (e.g., NVSN, SUPERNOVA, MAAGE/CAGE) and through international partnerships (e.g., bilateral engagements with Ministries of Health, WHO-led consortia, etc.) Opportunities for field investigation also exist with other branches in the Division responsible for prevention and control of disease caused by herpes viruses (varicella, herpes zoster, cytomegalovirus), measles, mumps, rubella, human papillomavirus, non-influenza respiratory viruses (MERS coronavirus, respiratory syncytial virus, parainfluenza, human metapneumovirus), and picornaviruses, including poliovirus). Finally, recent officers have participated in numerous Epi-Aids and emergency response deployments (e.g., scooter-related injuries, unexplained illness in US personnel working overseas, Zika and Ebola responses) and the position supports their ongoing participation.

1) Develop and conduct studies to evaluate the field effectiveness and safety of rotavirus vaccines with Ministries of Health and the World Health Organization in "early introduction" countries of East Europe, Asia, and Africa

2) Provide technical assistance, subject matter expertise, and oversight (including travel for field site visits) on bilateral partnerships to assess the burden of norovirus disease in Africa, Asia, and Latin America

3) Assist state and local health departments in prevention, surveillance, and response to norovirus outbreaks, including development and dissemination of guidelines, technical consultation, and coordination with federal regulatory partners

Proposed Surveillance Project:

Compare surveillance of norovirus using administrative databases, active and passive surveillance at sentinel healthcare facilities in various networks (New Vaccine Surveillance Network [NVSN], Surveillance Platform for Enteric and Respiratory Infectious Organisms at the Veterans Affairs [SUPERNOVA], Medically-Attended and Community Acute Gastroenteritis [MAAGE/CAGE] studies with Kaiser Permanente), and passive clinical laboratory-based surveillance (National Respiratory and Enteric Virus Surveillance System [NREVSS]) to identify the most efficient and effective surveillance approaches for assessing the endemic disease burden of norovirus.

Current Position Data:

1) National or nationally-representative administrative data (i.e., NCHS, MarketScan, HCUP)

2) Healthcare facility-based surveillance data (i.e., NVSN, SUPERNOVA, MAAGE/CAGE)

3) Outbreak surveillance data (i.e., NORS and CaliciNet)

Position Strengths: 1) Broad opportunities across two epidemiology teams in the Branch, in close collaboration with three Branch laboratory teams, and additional opportunities across the Division

2) Balanced mix of domestic and international projects ranging in scope from outbreak surveillance and disease burden studies to vaccine impact and safety evaluations

3) Considerable latitude in developing opportunities tailored to EIS officer interest, including agency-wide public health response activities

4) Extensive supervisory support from varied professional backgrounds (physicians, veterinarians, and PhD epidemiologists) with proven track record for productive EIS officers

5) Opportunity to rapidly develop subject matter expertise and make immediate public health impacts

Staff & Resources: In addition to the primary supervisor and 2 secondary supervisors, the position has 4 consultants with doctoral level training (3 are also former EIS officers) that support project supervision. Thus, considerable mentoring support is readily available. Teams are passionate, dedicated, and highly productive, while still maintaining strong work-life balances and high degrees of job satisfaction. Excellent support from leadership and collegial work environment. Close collaborations with the laboratory teams in the Branch provide strong support for epidemiologic activities and excellent statistical support is available within the Branch and Division, including a data analytic support team.

Special Skills Useful for this Position: 1) Energy and Enthusiasm
2) Team player
3) Eagerness to learn and contribute to public health
Domestic Travel: 10% **International Travel:** 20%

NCIRD-DVD-VVPDB-Georgia-2019-01

Primary Supervisor: Julia Gargano, Epidemiologist, EIS 2009

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Secondary Supervisor(s):

- Lauri Markowitz, Team Lead and Associate Director of Science for HPV, EIS 1983

Background: Human papillomavirus (HPV) can cause cervical and other genital cancers in women, and anal, oropharyngeal cancers in both women and men, genital warts, and juvenile-onset recurrent respiratory papillomatosis. There are three highly effective HPV vaccines; routine vaccination has been recommended in the United States since 2006 for girls and since 2011 for boys, but HPV vaccine uptake has been lower than target levels. The HPV team, located in the Division of Viral Diseases, is responsible for working on national vaccine policy with the Advisory Committee on Immunization Practices (ACIP), evaluating vaccine impact and effectiveness, investigating the epidemiology of HPV and associated outcomes and collaborating with other groups across the agency working on HPV and HPV vaccine implementation. The team provides subject matter expertise and conducts clinical and epidemiologic research and surveillance on HPV infections, cervical pre-cancers, and other outcomes. Team members have a wide range of expertise in epidemiologic methods, vaccine evaluation, public health policy issues, other sexually transmitted infections, infectious disease outbreaks and public health emergency responses.
Current Work: Analyses of trends in HPV16/18-associated cervical pre-cancers, trends in national HPV prevalence by race, evaluation of HPV-IMPACT surveillance system, planning baseline HPV prevalence survey in Botswana, analysis of HPV vaccine coverage in young men who have sex with men, presentation on vaccine acceptability to Advisory Committee on Immunization Practices (ACIP).
Proposed Initial Projects: Data and documentation to commence a surveillance evaluation are available in-house. Depending on the interests and goals of the officer, an analytic project could be developed using data on cervical pre-cancers from HPV-IMPACT (including HPV typing data and data on demographics, clinical information, and vaccination history); or genital NHANES prevalence, measured continuously since 2003 in females and since 2011 in males. An initial analytic project could be analysis of the latest cycle of NHANES genital HPV prevalence data, 2015-2016, which would provide an officer with opportunity to learn weighted analyses of complex survey data.
Proposed Analytic Project:
Choice of projects is flexible and depends on the skills and interests of the EISO in discussion with supervisors. Potential initial projects include:
(1) Investigate vaccine impact and associations between HPV prevalence and other factors using data from National Health and Nutrition Examination Survey (NHANES) (HPV team manages this biannual surveillance effort and has ready access to data);
(2) Evaluate HPV vaccine effectiveness against cervical pre-cancers by demographic characteristics using test-negative design in HPV-IMPACT surveillance data (data housed with team);
(3) Analyze data on HPV vaccine impact on cervical pre-cancers by birth cohort (HPV-IMPACT);
(4) Analyze data on HPV vaccine uptake from national surveys (data available, and could collaborate with another division in NCIRD);
(5) Analyze HPV prevalence data from a monitoring project in men who have sex with men;

(6) Analyze large insurance claims database (MarketScan) to evaluate trends in HPV-related diagnoses, HPV vaccination, or screening (data accessible in Division).
Available datasets (e.g. NHANES, HPV-IMPACT, and MarketScan) are large and suitable for complex analyses, including evaluation of confounding and effect modification, as needed to meet analytic CAL.
Proposed Field Investigation Project:
The team is committed to making sure EISO has opportunities for field work and original data collection within the team or in collaboration with other groups. Field investigations within this team may include: (1) Site visits for HPV-IMPACT, a population-based laboratory surveillance system that has monitored cervical pre-cancer incidence and vaccine types in tissue specimens in 5 geographically diverse U.S. communities (in CA, OR, NY, TN, CT) since 2008. HPV-IMPACT recently added invasive cervical cancers to the surveillance system. EISO may have the opportunity to travel to one or more sites to do an in-depth review of reasons (e.g. lack of prior screening, delays in treatment, social factors) that may explain why cancer was not prevented, and/or evaluate other aspects of surveillance. (2) Work with partners in Botswana, where team is launching a vaccine impact study, on a vaccination program evaluation or related project.
Opportunities may also arise to collaborate with partners to collect data for evaluation of vaccine introductions. Additionally, we encourage officers to participate in outbreak investigations of other viral diseases housed in the Division, including measles, mumps, MERS, AFM, etc. as opportunities arise; or participate in other Epi-Aids and public health responses in the agency. Previous EISOs have completed the field investigation CAL through participation in outbreak investigations (with other teams) and HPV vaccine-related field work, such as a current project in Botswana.

Officer will have opportunities to work with partners in state health departments and universities through analytic and/or evaluation projects with HPV-IMPACT, a 5-site surveillance system for cervical pre-cancers that is part of the Emerging Infections Program. This could involve participation in site visits, attendance at investigator meetings, and collaboration on specific studies.
The HPV team is partnering with the University of Botswana, the Botswana Ministry of Health and Wellness, and CDC Botswana on a baseline HPV prevalence survey, and the EISO could have opportunities to interact with international study partners through conference calls and/or site visits.
There are also opportunities to work with partners in 3 state/local health departments (Seattle, NYC, Philadelphia) for an ongoing project to monitor HPV prevalence in men who have sex with men.
The HPV Team collaborates across CDC with 5 centers working on different aspects of HPV and HPV vaccine.
There are numerous opportunities to provide education, information, and technical assistance about HPV and HPV vaccine to local health departments and other partners.
There may also be opportunities to assist with vaccine policy by working with the HPV Team to provide evidence for the Advisory Committee on Immunization Practices (ACIP) deliberations.

Proposed Surveillance Project:
The HPV Team is engaged in diverse surveillance efforts, providing an EISO with a variety of options.
(1) Evaluate oral HPV surveillance through National Health and Nutrition Examination Survey (NHANES). HPV-associated oropharynx cancer incidence has increased over the past decades. Beginning with the 2019-2020 NHANES cycle the CDC HPV team will manage oral HPV DNA typing in NHANES. Prior to that (2009-2016), oral HPV monitoring through NHANES was managed by a grant-funded university research group. The surveillance evaluation will include interaction with the CDC HPV laboratory where HPV testing and typing will be done, as the laboratory is critical for HPV vaccine impact evaluation efforts.
(2) Evaluate incorporation of invasive cancer in HPV-IMPACT at one site (involves site visit);
(3) Evaluate surveillance for recurrent respiratory papillomatosis (RRP);
(4) Evaluate a surveillance project for anal HPV in men who have sex with men, a 3-site surveillance system.

Current Position Data:

The HPV Team is a data-rich EIS assignment! Ongoing surveillance through HPV-IMPACT is coordinated by the HPV team, and our officer would have ample opportunity to conduct analyses with this rich data source (>30,000 cervical pre-cancers, with HPV typing data on two-thirds). In addition, many years of nationally representative data on genital HPV DNA prevalence (females, males), HPV serology, demographics, and sexual behaviors gathered through NHANES are available for analysis based on the EISO's interests. Data from other surveillance and research projects are housed here, and our collaborations across the agency afford access to others.
Position Strengths: This small team provides a nurturing and supportive environment, strong mentoring in epidemiology, and opportunities for the officer to take the lead on important projects with high visibility. Recent officers have presented to ACIP, traveled to national and international conferences, participated in EOC responses, published original work in high-impact journals, and collaborated with state and international partners. Officers can learn about other viral diseases through branch and division-level seminars and possible investigations. Center offers ongoing training in epidemiology and biostatistics through weekly seminar series.
Staff & Resources: The Team includes three EIS alumni and other epidemiologists who enjoy collaborating with and supporting EISOs, and have ample experience with EIS supervision, including Commissioned Corps expertise and experience mentoring both PhD and medical officers. HPV team staff have expertise in HPV and sexually transmitted infection-related subject matter, and many years of combined experience in surveillance, epidemiologic and statistical methods, and vaccine policy. Additional support is available from other epidemiologists in the branch and the Data Management and Statistics Activity within DVD. EISO can also interact with HPV and vaccine experts outside division through regularly scheduled CDC--wide meetings.
Special Skills Useful for this Position: Team player with ability to collaborate with multidisciplinary groups, and solicit and synthesize high-level input from a variety of sources. Interest in infectious disease, vaccine preventable diseases, adolescent or reproductive health, sexual health. An EISO with clinical experience and/or data analysis experience can use current skills and develop new ones in this position. There is ample opportunity to publish, so strong writing skills are a plus. Surveillance and analytic projects can be tailored to match the current and desired skills of the EISO. MDs, DVMs, and PhDs are all welcome on the HPV team!
Domestic Travel: 5% **International Travel:** 5%

NCIRD-DVD-VVPDB-Georgia-2019-02

Primary Supervisor: Tatiana Lanzieri, Medical epidemiologist

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Secondary Supervisor(s):

- Mariel Marlow, Epidemiologist, EIS 2015
- Paul Gastanaduy, Medical officer, EIS 2011

Background: Our team is responsible for epidemiology, surveillance and research programs for measles, mumps, rubella, domestic polio, varicella, herpes zoster and cytomegalovirus. The diverse pathogen mix includes vaccine preventable and non-vaccine preventable diseases and spans congenital, childhood and elderly populations. For some of our pathogens, endemic transmission has been eliminated in the US, but global burden remains with threats of importation. We are frequently involved in outbreak response and have numerous ongoing epidemiologic studies. Recently, we led multistate responses to AFM, mumps and measles outbreaks. We collaborate with our laboratory teams for outbreak investigations and research studies, as well as with the Division's Communications Team on health messaging and outbreak communications. We are leading the Advisory Committee on Immunization Practices (ACIP) workgroup this year for herpes zoster vaccine; this is an opportunity to understand evaluations, data and policy that inform national decisions on vaccination. Given the breadth of subject matter expertise, the team is frequently involved in international projects that the EISO could participate in.

Current Work: Acute Flaccid Myelitis (AFM, "polio-like illness"?) surveillance, 2018; development of AFM case series/case-control study; Herpes zoster risk in immunocompromised populations (ACIP); Measles-like illness investigations in the US; Mumps surveillance system evaluation"”Kosrae, Micronesia; Knowledge, Attitudes, and Practices Survey for 3rd MMR dose; Epi-Aids: Mumps (Micronesia), Newborn Hearing Detection/Intervention (Texas).

Proposed Initial Projects: - Syndromic surveillance to enhance early detection of acute flaccid myelitis (AFM);

- Growth curve modeling to compare trajectory of hearing loss related to congenital CMV and genetic causes.
- First analysis of the ELC Mumps Enhanced Surveillance data to determine if changes are needed to the Council of State and Territorial Epidemiologists (CSTE) case definition for mumps, and assess barriers to national reporting and laboratory testing
- Risk for infertility following testicular atrophy caused by mumps infection using a large patient insurance claims database (MarketScan)

Proposed Analytic Project:

The EISO will have the opportunity to work with a subject matter expert on high-impact projects that inform national policy, several of which use large de-identified datasets and do not require further IRB review, including, but not limited to:

- Syndromic surveillance to enhance early detection of acute flaccid myelitis (AFM);
- Efficacy of new shingles vaccine (Shingrix) among persons with autoimmune disease;
- Growth curve modeling to compare trajectory of hearing loss related to congenital CMV and genetic causes.
- Modeling risk of measles importation into the US and factors associated with increased transmission in Canada, Brazil, and the US;
- Risk for infertility following testicular atrophy caused by mumps infection using a large patient insurance claims database (MarketScan);
- Modeling the resurgence of mumps among highly vaccinated populations;
- Meta-analyses and estimating the global burden of emerging diseases (AFM and mumps).

Proposed Field Investigation Project:

The MMRHP Team is frequently involved in outbreak response (measles, mumps, AFM) and have numerous ongoing epidemiologic studies (CMV, varicella, herpes zoster), with opportunities for primary data collection through surveys, interviews and chart reviews. The EISO can also participate in several projects that will launch this year including:

- Case-control study to determine risk factors for AFM;
- National provider survey on barriers to mumps testing and reporting;
- Early uptake of Shingrix among persons on biologics.

We also support EISOs participation in Epi-Aids and emergency response deployments. Our EISOs and team members participated in the following Epi-Aids and responses: Mumps (Arkansas); Mumps (Micronesia); Mumps/Varicella (detained migrants in ICE custody); Zika (Micronesia), AFM (Arizona); Newborn Hearing Detection and Intervention (Texas); Measles (Washington). Several of these were used by officers to satisfy requirements of the field investigation CAL.

The EISO will have an opportunity to collaborate with public health partners through field investigations and multistate outbreak responses coordinated by the MMRHP Team, and also to participate on several projects that require collaboration with public health partners and across different Centers at CDC, including, but not limited to:

- Developing the epidemiology response component of the national polio response plan;

- Advisory Committee on Immunization Practices (ACIP) working groups for Herpes Zoster that includes internal and external medical and public health experts, public and private stakeholders, and consumer representatives;
- Collaboration with the National Center on Birth Defects and Developmental Disabilities and National Center for Environmental Health for evaluating current and proposed approaches to newborn CMV screening to inform policy;
- Epidemiology and Laboratory Capacity (ELC) mumps activities with 23 health departments.

Proposed Surveillance Project:
National AFM surveillance -- Given the recent surge in cases, and media attention, resources have been provided to create national surveillance for AFM. However, as the etiologic agent that causes AFM remains unknown, the surveillance case definition for AFM requires complicated reporting mechanisms and extensive clinical history that is not always available. The EISO will have the rare opportunity to evaluate a novel national surveillance system for an illness with unknown etiology. This will require the EISO to integrate with the AFM team and collaborate with state and local health departments, academic centers, and laboratories.

Alternate project: Integrated epidemiologic and laboratory data platform for mumps surveillance -- a mumps workgroup has recently highlighted the need for timely integration of epidemiologic and laboratory databases housed in different surveillance systems. This surveillance evaluation is unique in that the EISO will have the opportunity to evaluate the application and adoption of existing data integration platforms used by other CDC teams for use with DVD pathogens.

Current Position Data:
The MMRHP Team has access to a variety of databases, including but not limited to: MarketScan data; National Health and Nutrition Examination Survey data; New Vaccine Surveillance Network; Longitudinal data for children with congenital CMV infection; longitudinal data for children with hearing loss (AudGenDb); ELC Enhanced Mumps Surveillance.
Position Strengths: 1) Diversity of expertise among supervisors and mentors who are committed to training as evidenced by a long history of successful EISOs, 2) Variety of pathogens including several of major public health significance and media attention, 3) Frequent interaction with local and state health departments, 4) Flexibility for involvement in activities outside the team.
Staff & Resources: Several team members are EIS alumni or have collaborated with EISO on various surveillance and research projects in the past. The combined skills of the MMRHP Team members, including mentoring, data management, data analysis, epidemiology and public health, risk communication, outbreak response, and scientific writing, along with opportunities to collaborate with public health partners, offer an excellent opportunity for the EISO to thrive.
Special Skills Useful for this Position: Ability to handle multiple priorities and be flexible to work on projects that will build upon different subject matter expertise, including vaccine preventable and non-vaccine preventable diseases.
Domestic Travel: 5% **International Travel:** 5%

NCIRD-ID-EB-Georgia-2019-01

Primary Supervisor: Carmen Arriola, Epidemiologist, EIS 2013
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Secondary Supervisor(s):
- Matthew Biggerstaff, Epidemiologist

Background: This position is one of two positions in the Influenza Division's Epidemiology and Prevention Branch. The branch objectives are to detect and respond to influenza threats and to create the evidence base for, support the development and implementation of, and improve the impact of influenza control and prevention programs in the U.S. and globally. Additionally the branch is engaged in the Influenza Vaccine Improvement Initiative with multiple new surveillance and research platforms in development.
The EISO will work in a collegial atmosphere with support from clinicians, epidemiologists and laboratory scientists who are working on innovative influenza research. EISOs will have the opportunity to gain experience in a variety of activities including studies of vaccine effectiveness, antiviral use, disease burden, surveillance, modeling, forecasting, pandemic preparedness and response, health communications through media interviews and educational outreach programs, and domestic field activities. In addition, EPB has a large international focus, with active collaborations in >40 countries. The EISO will have opportunities for international research and field activities if desired. In addition, the EISO may investigate outbreaks during seasonal influenza epidemics or of novel influenza A viruses, such as avian influenza H5 and H7 viruses and variant (swine-origin) influenza viruses as they occur.

Current Work: -Evaluation of Detection and Response to Respiratory Threats (DARRT) Pilot Surveillance System in Thailand (2018);
- Pilot of national-level severity assessment and burden estimation methods at the state-level""Utah and Minnesota (2018)
- Enhanced Surveillance for influenza at US Customs and Border Patrol Facilities -- El Paso, Texas (2019)

Proposed Initial Projects: Here are just some of the projects that are ready for an EISO to take on when they start in EPB:
1) Evaluate the usefulness of automatically transmitted influenza rapid test result data from outpatient clinics for influenza surveillance
2) Describe vaccine effectiveness by subtype and lineage for pediatric age groups using data from the US VE Network
3) Determining the association between neighborhood-level poverty and pneumonia and sepsis in those hospitalized with influenza

Proposed Analytic Project:
EISOs in EPB have a wide range of analytic projects to choose from. Because we own or have direct access to datasets from many sources, supervisors in EPB work with EISOs from the beginning of the fellowship to select from a list of projects that are ready for analyses. Additionally, statistical support is readily available from the branch's statistics unit.

Analytic projects include (but are not limited to):
- Describe influenza testing and antiviral treatment among patients hospitalized with acute respiratory illness;
- Describe viral shedding and asymptomatic detection of influenza and other respiratory viruses from household-based community surveillance;
- Determine the relative risk of influenza hospitalization by select underlying conditions among adults;
- Evaluate the antibody response to influenza vaccination in young children;
- Determine the association between the social vulnerability index with rates of influenza-associated hospitalization and mortality during or after hospitalization;
- Estimate influenza vaccine effectiveness studies applying multivariate modeling;
- Estimate the influenza disease burden in low and middle-income countries;
- Model the impact of influenza vaccination in low and middle-income countries;
- Estimate the cost-effectiveness of influenza vaccination in low- and middle-income countries

Please visit the Influenza Division table for detailed descriptions and a list of additional projects.

Proposed Field Investigation Project:
The Influenza Division has staff in 11 countries and supports influenza coordinators in all 50 states in the U.S. International projects are possible in any country with branch-supported staff. International projects could include surveillance evaluations, health utilization surveys, and disease burden and severity assessments. EISOs may also work in the field in the US on rapid assessments during flu season, enhanced data collection to better understand severity of disease, implement case-control studies of novel influenza viruses, or implement and evaluate surveillance in shelters for migrants or people displaced by disasters. In the past, field investigations led by EISOs in our team included investigating a respiratory outbreak among unaccompanied minors from Central America (in collaboration with HHS); investigating an increase of human infections with avian influenza virus in Cambodia; investigating transmission of novel influenza virus H7N9 detected in China; leading an outbreak investigation of influenza among cats in an animal shelter in New York; investigating influenza vaccination barriers in Puerto Rico; leading a multi-State investigation of influenza-associated parotitis; and supporting the 2009 pandemic investigation, including describing the epidemiology and clinical course of disease caused by the pandemic virus, measuring the burden in the population, and estimating the impact of interventions. Additionally, supervisors are supportive of EISOs working on epi aids with groups outside of EPB.
All of the field work done by the Influenza Division is in collaboration with state and local governments, universities, US government agencies, Ministries of Health, NGOs, the World Health Organization, or other United Nation agencies. EISOs have opportunities to interact with these organizations on field investigations. In addition, Influenza Division works closely with other divisions within NCIRD, such as Division of Viral Diseases and the Immunization Services Division. EISO may have the opportunity to gain experience in other public health areas and network with subject matter experts outside of influenza.
Proposed Surveillance Project:
1) Evaluate human surveillance for novel influenza in live bird markets in Cambodia
Live bird markets (LBM) are primary sources for transmission of novel influenza viruses to humans. There is much surveillance for illness in birds in LBM throughout the SE Asian region. However, there has been little standardization of complementary human surveillance in LBM. Under the guidance of two experienced supervisors the EISO would be asked to evaluate the effectiveness of the human surveillance protocols during routine LBM Surveillance in Phnom Penh, Cambodia. Objectives are to improve and align the human surveillance to meet influenza detection and global health security needs. The EISO would design the evaluation, work with field teams to carry out the evaluation, adapt current human sampling methodology to better address local needs and regional priorities, make recommendations for future LBMS activities, and prepare a report and publication. There would be travel for this project.

2) Evaluation of other countries national influenza surveillance systems
EPB has staff in 11 countries as well as many staff at headquarters that support influenza surveillance throughout the world. Surveillance evaluations of these systems would include at least 1 trip to the field and could be conducted in one of our partner countries. Surveillance evaluations for national influenza surveillance are critical for countries to gain situational awareness of influenza and to support efforts in estimating the burden of influenza.

Current Position Data:
EPB currently manages a number of surveillance systems and research networks that provide many opportunities for data analyses. Among these are 1) The influenza hospitalization surveillance network, or FluSurv-NET, which collects multi-site hospitalization data; 2) ILINet, an outpatient surveillance database used to monitor influenza activity; 3) The US VE Network, HAIVEN and NVSN, provide data for studies on influenza vaccine effectiveness; 4) international cohort studies (PRIME, HCP) provide data for disease burden and influenza vaccine effectiveness estimations in specific target groups; 5) FluSight, which captures data from 30+ forecasts for timing, intensity, and short-term trajectory of influenza in the US.

Position Strengths: The Division have a strong commitment to and long history of mentoring EISOs, and there are currently over 15 EIS alumni in the branch. Influenza is a high-profile disease with broad public health impact, and there are opportunities to gain experience in a broad range of public health areas including One Health, vaccines, surveillance, pandemic preparedness, modeling, just to mention a few. The Influenza Division has data readily available for basic and advanced analyses. EISOs will have the opportunity to work along with investigators from academia and state and local health departments as well as international partners such as WHO.
Staff & Resources: EPB has >60 physicians, veterinarians, epidemiologists and statisticians with experience in state, federal, and international public health, including >15 EIS alumni. The branch recently added a statistics unit, and assistance will be available to EISOs. The Influenza Division also has a large laboratory group and strong communications team that support EISO activities.
Special Skills Useful for this Position: Our positions offer flexibility based on individual preference and level of experience in epidemiology, while ensuring that EISOs gain experience in fundamental public health practice. We have worked happily and successfully with clinicians, veterinarians, and doctoral-level scientists and epidemiologists in the past. We require a passion for service and public health an interest in learning, and the ability to work collaboratively in a variety of settings.
Domestic Travel: 10% **International Travel:** 10%

NCIRD-ID-EPB-Georgia-2019-01

Primary Supervisor: Manish Patel, Team Lead

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Secondary Supervisor(s):

- Bill Davis, Epidemiologist, EIS 2016

Background: This position is one of two positions in the Epidemiology and Prevention Branch (EPB) of the Influenza Division. The branch objectives are to detect and respond to influenza threats, to create the evidence base for, support the development and implementation of, and improve the impact of influenza control and prevention programs in the U.S. and globally. Additionally the branch is engaged in the Influenza Vaccine Improvement Initiative with multiple new surveillance and research platforms.

The EISO will work in a collegial atmosphere with support from clinicians, epidemiologists, laboratory scientists and statisticians working on innovative influenza research. EISOs will have the opportunity to participate in a variety of activities including studies of vaccine effectiveness, antiviral use, disease burden, surveillance, modeling, forecasting, pandemic preparedness and response and domestic/international field activities. EISOs will also have opportunities to gain experience in health communications through media interviews and educational outreach programs. EPB has a large international focus, with active collaborations in >40 countries; EISOs will have opportunities for international work, if desired. In addition, they may also investigate outbreaks during seasonal influenza epidemics or of novel influenza A viruses, such as avian influenza H5 and H7 viruses and variant (swine-origin) influenza viruses.
Current Work: -Cardiac complications among adults hospitalized with influenza;

- Field investigation of biases associated with high dose influenza vaccine in older adults;
- Effect of initial exposures to antigenically novel influenza A(H3N2) on VE in children;
- Evaluation of influenza surveillance and reporting in Puerto Rico after Hurricane Maria;

Proposed Initial Projects: Here are just some of the projects that are ready for an EISO to take on when they start in EPB:

1) Describe the viral etiologies and incidence associated with adults hospitalized with lower respiratory tract infections;
2) Differences in influenza testing practices in hospitals that serve impoverished area
3) In addition to these two projects, all analytic projects listed previously are ready to be started immediately.

Proposed Analytic Project:
EISOs in EPB have a wide range of descriptive and analytic projects to choose from. These projects range from simple descriptions of clinical or demographic epidemiology of influenza to complex control of confounding in vaccine effectiveness studies. Because we own or have direct access to datasets from many sources, supervisors in EPB work with EISOs from the beginning to select from a list of projects that are ready for the officer to dive right into. Additionally, statistical support is readily available from the branch's statistics unit. EPB's datasets include surveillance data from networks and data collection from ongoing long-term projects. All projects listed here are ready for immediate analysis.
Analytic projects include:
- Association between neighborhood-level poverty and rates of community-acquired pneumonia and sepsis among patients hospitalized with laboratory-confirmed influenza
- Describe the viral etiologies and incidence associated with adults hospitalized with lower respiratory tract infections
- Cost-effectiveness analysis of influenza vaccination in Peru
- Analyze the positive predictive value of clinical syndromes for influenza in the U.S. vaccine effectiveness network
- Describe the effectiveness of influenza antivirals by virus subtype and type using data from a placebo-controlled trial

Please visit the Influenza Division table for detailed descriptions and a list of additional projects.
Proposed Field Investigation Project:
EPB provides multiple opportunities for primary data collection and field investigations; EPB has always been able to provide satisfactory field experiences for two EISOs per class. The Influenza Division has staff in 11 countries and supports influenza coordinators in all 50 US states. International projects are possible in any country with branch-supported staff. International projects could include surveillance evaluations, health utilization surveys, and disease burden and severity assessments. EISOs may also work in the field in the US on rapid assessments of testing protocols during flu season, enhanced data collection to better understand severity of disease, implement case-control studies of novel flu viruses, implement and evaluate surveillance in shelters for migrants or people displaced by disasters. Additionally, supervisors are supportive of EISOs working on epi aids and emergency response deployments with groups outside of EPB.

Recent EISO projects that have fulfilled this CAL include: Influenza and Other Respiratory Pathogen Enhanced Surveillance at US Customs and Border Patrol Facilities -- El Paso, Texas; Health care utilization survey in Cambodia; Field investigation of biases associated with receipt of high dose influenza vaccine in older adults; Detection and Response to Respiratory Threats (DARRT) Pilot Surveillance System in Thailand; Cost of respiratory illness estimates in South Africa; Rapid assessment of influenza burden and severity in Utah, Minnesota and Arizona; Variant influenza from swine exposure at state agricultural fairs; Avian influenza outbreak in cats in New York City; Economic and vaccine impact in pregnant women in Kenya; Surveillance for acute respiratory infection in India.
All of the field work done by the division is in collaboration with state and local governments, US government agencies, ministries of health, NGOs, WHO, or other UN agencies. EISOs will interact with these organizations on field investigations.

Proposed Surveillance Project:

1) Assess FluSight seasonal forecasting system: formal evaluation of consortium of modeling experts' forecasts of seasonal flu trends

Since 2013, flu experts within the Influenza Division have worked with outside academic and private industry researchers to advance flu forecasting. During the flu season, forecasting team submits their forecasts, based on a variety of methods and data sources, weekly to CDC. Acceptance of the system by CDC has grown, and CDC now posts short summaries of the forecasts online. This surveillance project would primarily be based at headquarters and would focus on the timeliness of reporting forecasts, the acceptability of forecasts to various federal/state/local stakeholders, as well as some additional analysis of accuracy of forecasts. This evaluation would involve activities based at headquarters.

2) Evaluation of other countries national influenza surveillance systems

EPB has staff in 11 countries as well as many staff at headquarters that support influenza surveillance throughout the world. Surveillance evaluations of these systems would include at least 1 trip to the field and could be conducted in: Morocco, Tunisia, Cote d'Ivoire, Mali, Togo, Burkina Faso, as well as other countries in the Eastern Mediterranean and Western Pacific regions. Surveillance evaluations for national influenza surveillance are critical for countries to gain situational awareness of influenza and to support efforts in estimating the burden of influenza.

Current Position Data:

The branch has access to multiple datasets from several clinical trials, observational studies, and surveillance networks. Some of these include: FluSurv-NET(national, hospitalized patients), ILINet (national, outpatient visits), Pediatric Mortality and National Center for Health Statistics Mortality Surveillance System (national), WHO/NREVSS laboratories, US VE Network (multi-site vaccine effectiveness study), Etiology of Pneumonia in the Community (multi-center, laboratory and epidemiology, multiple pathogen), HAIVEN and NVSN (multi-site, hospitalized VE networks, adult and pediatric, respectively), MarketScan (patient level data from commercial insurance claims), and an RCT of antiviral treatment in Bangladesh.

Position Strengths: Supervisors have a strong commitment to and long history of mentoring EISO and there are currently over 15 EIS alumni in the branch. Influenza is a high-profile disease with broad public health impact and there are opportunities to gain experience in a broad range of public health areas including vaccines and other therapeutics, surveillance, pandemic preparedness, economics, policy and complex epidemiologic analyses. Additional strengths of this position are the large amounts of data that are readily available for basic and more advanced analyses and potential for domestic and international experiences.

Staff & Resources: EPB has >60 physicians, veterinarians, epidemiologists and statisticians with experience in state, federal, and international public health, including >15 EIS alumni. The branch recently added a statistics unit, and assistance will be available to EISOs. The Influenza Division also has a large laboratory group and strong communications team that support EISO activities.

Special Skills Useful for this Position: Our positions offer flexibility based on individual preference and level of experience in epidemiology, while ensuring that EISOs gain experience in fundamental public health practice. A passion for service and public health and interest in learning as well as the ability to work collaboratively in a variety of settings are all desirable skills. We have worked happily and successfully with clinicians, veterinarians, and doctoral-level scientists and epidemiologists in the past.

Domestic Travel: 10% **International Travel:** 10%

National Institute for Occupational Safety and Health

The National Institute for Occupational Safety and Health (NIOSH) is the CDC center responsible for conducting epidemiologic investigations occurring in workplaces. EISOs can provide significant service working with often overlooked and vulnerable populations. NIOSH EISOs have evaluated: lung and cardiovascular health among coal miners; chemical exposures in a vape shop; exposure to opioids among first responders; pesticide exposures to migrant farmworkers; musculoskeletal disorders in chicken eviscerations; pulmonary toxins including asbestos and microwave popcorn flavorings; intentional violence targeted at nurses and taxi drivers; biomarkers in workers exposed to nanofibers; miscarriages among flight attendants; natural disasters and release of chemical and biologic agents affecting workers in postal services and emergency response. NIOSH tailors positions to the EISOs' interests. Positions can include both fieldwork and advanced analytic opportunities.

NIOSH-DSHEFS-HETAB-Ohio-2019-01

Primary Supervisor: Marie de Perio, Supervisory Medical Officer, EIS 2008

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Secondary Supervisor(s):

- Douglas Trout, Branch Chief, EIS 1992
- John Gibbins, Supervisory Veterinary Officer, EIS 2006

Background: NIOSH's Health Hazard Evaluation (HHE) Program is a congressionally mandated program established in 1971. HHEs are investigations in the workplace that are equivalent to Epi-Aids in terms of completion of EIS Core Activities of Learning. Through the HHE program, NIOSH responds to requests for assistance from employers, employees and their representatives, and government agencies to identify chemical, biological, or physical hazards in workplaces throughout the United States. EIS officers will have a broad-based occupational epidemiology experience and can be involved in evaluations involving workplace exposures, medical testing, and biological monitoring of workers.

As an EIS officer in the Hazard Evaluation and Technical Assistance Branch (HETAB), which houses the HHE program, you will work with an experienced team of NIOSH physicians, epidemiologists, industrial hygienists, and statisticians. We are looking for an officer with exceptional interpersonal skills to interact with workers and union and management representatives in multiple types of worksites. For more information about the HHE program, visit http://www.cdc.gov/niosh/hhe.

Our EIS officers have the opportunity to: 1) conduct multiple HHEs in a variety of workplaces, 2) develop public health prevention strategies in a variety of workplaces, and 3) deal with emerging occupational illnesses and injuries, including responding to emergencies.

Current Work: -Exposure to opioids in first responders and crime evidence laboratories, multiple states
-Exposures to metals and noise at an aircraft parts manufacturer, OR
-Lead exposures in a bullet manufacturing plant, MO
-Carbon disulfide exposures in a meat casing facility, IL
-Brucella exposures at a feral hog slaughterhouse, TX

Proposed Initial Projects: Each EIS officer will conduct approximately 4--6 HHEs during each year of assignment. Several HHE requests come in every week, and the EIS officer will work with the supervisors for the best epidemiological projects. Our most common evaluated industry sectors include the services, healthcare and social assistance, manufacturing, wholesale and retail trade, and public safety sectors. There are ample

opportunities for projects examining a wealth of occupational exposures and health outcomes because the HHE program responds to requests nationwide. Historically, several projects are identified for EISOs before their arrival to Cincinnati in August.

Proposed Analytic Project:

We offer EISOs the opportunity to pursue analytic projects that align with their area of interests and expertise, while meeting program goals. Our evaluations offer EISOs the opportunity to analyze both health and industrial hygiene data in combination using appropriate methods. We have PhD--level epidemiologists in our Branch and statisticians available to assist. Protocol development is straightforward as our program does public health practice and response activities so individual projects typically do not require IRB or OMB review. It is also possible to work with our colleagues in our Division's Surveillance Branch and analyze larger datasets, including data from occupational illness surveillance and the National Health Interview Survey.

Proposed Field Investigation Project:

EISOs will have ample opportunities to do field investigations (HHEs) that involve interviews, questionnaire development and administration, biologic and industrial hygiene sampling, data analysis, and development of recommendations to improve worker safety and health. We also support EISOs participating in Epi-AIDS and emergency response deployments. Examples include Ebola, Zika, and hurricane responses both nationally and internationally.

EISOs will interact with local and state public health partners and other federal agencies such as the Occupational Safety and Health Administration (OSHA) while doing field investigations (HHEs). EISOs will also work with subject matter experts throughout NIOSH and CDC as appropriate to incorporate their expertise into field evaluations. We encourage EISOs to collaborate with local occupational groups and universities through providing and attending presentations on occupational health topics.

Proposed Surveillance Project:

EIS officers can work with our NIOSH Surveillance Branch and can evaluate NIOSH-funded state health department's occupational disease surveillance systems, which cover pesticide poisonings, silicosis, burns, and lead. There are also opportunities to examine other large surveillance systems including Bureau of Workers Compensation and Bureau of Labor Statistics. EIS officers may also examine large infectious disease and cancer surveillance systems and focus on the collection of occupation and industry information. These options often involve a site visit/field evaluation of the surveillance system.

Current Position Data:

We have >30 years of data collected from HHEs in a variety of exposures. Our Division also has data from large industry-wide cohort studies and surveillance systems, which EIS officers can access.

Position Strengths: We have an unmatched opportunity to delve into many types of exposures and illnesses in various workplaces. Our work is challenging and interesting. We have a great mission and impact workers. Our Congressional mandate gives us access to workplaces under federal law. We have a family-friendly work climate with helpful co-workers. We offer autonomy combined with experienced supervision.

Staff & Resources: The HETAB medical section consists of a multidisciplinary team of physicians, nurse epidemiologists, doctoral level epidemiologists, a veterinarian, and a behavioral scientist; most are former EIS officers. The industrial hygiene section has 12 masters or doctoral level industrial hygienists. Other staff include a statistician, a writer-editor, a health communications specialist, and secretaries. NIOSH Cincinnati has >450 staff including chemists, engineers, biologists, and social scientists. NIOSH has approximately 1,200 employees nationwide with a variety of expertise that is available to EISOs.

Special Skills Useful for this Position: A clinical background and excellent judgment to be able to discern the work-relatedness of symptoms are helpful. An ability to lead public meetings with workers, employers, and attorneys, sometimes in challenging situations. Ability to manage several projects at once on a variety of topics. Excellent communication and writing skills. Ability to work in teams. Spanish or other language fluency can be helpful, but it is not necessary.

Domestic Travel: 20% **International Travel:** 0%

NIOSH-DSHEFS-ISB-Ohio-2019-01

Primary Supervisor: Christina Lawson, Epidemiologist Team Lead

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Secondary Supervisor(s):

- Candice Johnson, Epidemiologist, EIS 2012
- Elizabeth Whelan, Branch Chief, EIS 1991

Background: This premier research program conducts large-scale, in-depth epidemiologic studies examining the health effects of workplace exposures across industries and occupations. Findings have an impact on occupational health regulations, policies that protect workers, and recommendations for controlling hazards. Major research initiatives in cancer, chronic disease, reproductive health, musculoskeletal disorders, and epidemiologic methods with national and international impact are a focus of the Branch. Recent studies include: cancer incidence among flight attendants and firefighters; cancer mortality among nuclear workers (in collaboration with the International Agency for Research on Cancer); guidelines for lifting during pregnancy; parental occupational exposures and birth defects in the National Birth Defects Prevention Study (NBDPS); shift work, heavy lifting, chemical exposures, and reproductive health in the Nurses' Health Studies (NHS); and studies of occupation and cardiovascular disease in the Multi-Ethnic Study of Atherosclerosis (MESA) and Reasons for Geographic and Racial Differences in Stroke (REGARDS) cohorts. The wide variety of research in the Branch will allow the EISO to work with their supervisor to choose the projects of most interest to them. EISOs also design, conduct, and complete new research studies that fall within the NIOSH mission, and have the opportunity to take part in fieldwork.

Current Work: Maternal exposure to oil mist and birth defects
Birth defects among offspring of nail technicians
Cross-sectional study of biomarkers in workers exposed to carbon nanotubes and nanofibers
Occupational neurodegenerative disease mortality in a nationally representative surveillance system
Workplace secondhand smoke exposure among pregnant workers
Nonfatal workplace violence by occupation

Proposed Initial Projects: Supervisors will work with the EISO to identify the most suitable projects. Examples of projects already planned by IWSB epidemiologists and ready for the EISO to begin include: (a) Investigating associations between maternal and paternal occupational exposures and birth outcomes in the National Birth Defects Prevention Study; (b) Examining the role of occupation in immigrant health in the Multi-Ethnic Study of Atherosclerosis (MESA) study; (c) Using national death data to investigate cause of death among various occupational groups.

Proposed Analytic Project:

Industrywide Studies Branch (IWSB) is known for its strengths in analytic epidemiology and epidemiologic methods. EISOs are expected to use advanced statistical techniques to analyze complex data. These techniques include a wide variety of multivariable models (e.g., logistic, Cox, Poisson, quantile regression) and, if the EISO chooses, the development or application of new epidemiologic and statistical methods to advance the field of occupational epidemiology. Supervisors will work with EISOs to identify the most suitable projects for the EISO's interest and skills. Doctoral-level statisticians and epidemiologists in IWSB are available to assist the EISO with their analytic projects. IWSB researchers are actively involved in analyzing over 50 different datasets, most of which are available for the EISO to begin working on immediately or after a short period of training.

Proposed Field Investigation Project:

EISOs are encouraged to participate in a variety of NIOSH Health Hazard Evaluations and domestic and international Epi-Aids to gain field experience. Participation in large-scale CDC or NIOSH responses, such as to Ebola or Zika, are also supported. In addition, IWSB field investigations present opportunities for EISOs to participate in fieldwork. Examples of recent field work completed by EISOs include:

- IWSB field study: Exposure assessment cohort study of wildland fire fighters
- IWSB field study: Records collection for an exposure cohort of workers manufacturing carbon nanotubes

- Health Hazard Evaluation: chemical exposures among workers at a windblade manufacturing plant
- Health Hazard Evaluation: behavioral health outcomes related to opioid response in first responders
- Epi-Aid: occupational outbreak of legionellosis in West Virginia
- Epi-Aid: histoplasmosis among tunnel workers in the Dominican Republic

The Branch routinely collaborates with state, federal, and academic public health partners when conducting studies; the EISO will work with these partners in the course of their normal duties. For example, the Branch works closely with state agencies on workers' compensation research (e.g., Ohio Bureau of Workers' Compensation) and collaborates with academic institutions for etiologic research (e.g., Multi-Ethnic Study of Atherosclerosis [MESA], Reasons for Geographic and Racial Differences in Stroke [REGARDS] studies). EISOs will have the opportunity to work with public health partners in a more applied setting through Health Hazard Evaluations, fieldwork, and Epi-Aids.

Proposed Surveillance Project:

Options include: (a) Evaluate a proposed registry of nanomaterial-exposed workers for surveillance of occupational illnesses; (b) Evaluate use of workers' compensation data for occupational injury and illness surveillance; and (c) Use the National Health Interview Survey (NHIS), National Occupational Mortality Surveillance (NOMS), or other public use datasets to design an evaluation project to suit the EISO's specific research interests. The EISO will work directly with state and local stakeholders through a combination of site visits and review of system documents from Cincinnati.

Current Position Data:

- Large datasets from academic collaborators, such as the Multi-Ethnic Study of Atherosclerosis (MESA), Nurses' Health Studies (NHS), and Reasons for Geographic and Racial Disparities in Stroke (REGARDS)
- Public use datasets such as the National Health Interview Survey (NHIS) and National Occupational Mortality Surveillance (NOMS)
- Over 50 occupational cohorts covering a wide variety of occupations, exposures, and disease endpoints
- Workers' compensation data from multiple states

Position Strengths: The Industrywide Studies Branch has outstanding opportunities for the incoming EISO, including:

- Numerous opportunities available for conducting and analyzing large epidemiologic studies
- Wide variety of projects, study designs, and methods with potential for highly influential findings
- Collaborative, multi-disciplinary team approach
- Excellent work-life balance (EISOs typically do not work or check email during evenings or weekends)
- Private offices, onsite fitness center, onsite personal trainer, sit-stand or walking workstation (treadmill desk)
- Colleagues who are passionate about improving workers' safety and health
- Living in Cincinnati. Cincinnati is fun!

Staff & Resources: The Branch includes over 25 researchers (current/former EISOs, epidemiologists, industrial hygienists, and statisticians), programmers, and research assistants. Fully equipped private offices are provided, as are resources to attend conferences and seek additional training.

Special Skills Useful for this Position: Because of the Branch's focus on analysis of complex data, EISOs with strong data analysis skills and the ability and desire to analyze data independently would thrive in this position. Special skills useful for this position include: graduate-level training in logistic, linear, and Cox regression; prior experience analyzing data from large case-control and cohort studies; fluency in SAS or R programming; a track record of publication in peer-reviewed journals and presentations at scientific conferences; and strong oral and written communication skills.

Domestic Travel: 10% **International Travel:** 0%

NIOSH-DSHEFS-SB-Ohio-2019-01

Primary Supervisor: Matthew Groenewold, Epidemiologist, EIS 2008

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Secondary Supervisor(s):

- Sara Luckhaupt, Team Lead, EIS 2006
- Marie Haring-Sweeney, Branch Chief

Background: The Division of Surveillance, Hazard Evaluations and Field Studies (DSHEFS) Surveillance Branch (SB) is the CDC group responsible for conducting surveillance of disease and hazards in the nation's labor force. The intent is to provide both early detection of emerging problems and continuous assessment of the magnitude and trends of job-related illnesses and hazards. Surveillance findings are used to guide prevention and intervention efforts. They are often used to establish new CDC and NIOSH public health policies, and to strengthen occupational health regulations. EISOs are encouraged to participate in a variety of NIOSH Health Hazard Evaluations (workplace-based field investigations of suspected occupational health issues similar to Epi-Aids) and domestic and international Epi-Aids to gain field experience.

Current Work: Exploring occupational patterns in opioid overdose deaths; identifying occupational risk factors for infectious diseases; investigating outbreaks of acute pesticide-related illness; analyzing existing datasets to identify morbidity associated with occupational exposures; assessing the risk of specific cancers and other chronic conditions in various jobs.

Proposed Initial Projects: Supervisors will work with the officer to identify suitable projects based on the officer's interest, skills and goals for development. Within the first month of arriving in the SB, the officer could begin working on an evaluation of a new national surveillance system for health-related workplace absenteeism; on new analyses of industry and occupation-coded BRFSS data; on a project to identify demographic, clinical, and operational characteristics of EMS response that are associated with occupational injuries and exposures to EMS personnel; and on a health-informatics project to build an industry and occupation coding capability into CDC's Epi Info software, among others.

Proposed Analytic Project:

There is a broad range of analytic project opportunities available to the SB EISO. A significant portion of the core work done in the SB involves the analysis of pre-existing datasets to identify associations between work-related hazards and other risk factors and various occupational health outcomes. Because many of the datasets used for these analyses come from national surveys, the officer will have the opportunity to gain experience in the analysis of complex survey data. These analyses usually go beyond simple descriptive epidemiology to test specific research hypotheses and often involve multivariable or multi-level regression modeling, among other advanced statistical approaches. Possible examples include analyzing state-based Emergency Medical Services (EMS) response data to identify demographic, clinical and operational characteristics of ambulance runs that are associated with occupational injuries and exposures among Emergency Medical Technicians (EMTs) and paramedics; analyzing industry and occupation-coded data from the Behavioral Risk Factor Surveillance System (BRFSS) to assess how exposure-outcome associations vary across occupational categories; and analyzing industry and occupation-coded death certificate data to identify high-mortality occupations. The EISO may also develop analytic projects by working with state health departments and with programs in other CDC centers to perform occupationally oriented analyses of their data.

Proposed Field Investigation Project:

The core work of the SB rarely involves fieldwork. However, EISOs in the branch are afforded opportunities and encouraged to gain field investigation experience by participating in NIOSH Health Hazard Evaluations (HHEs) and Epi-Aids. HHEs are workplace-based field investigations of suspected occupational health hazards carried out by the Hazard Evaluation and Technical Assistance Branch (HETAB)""the SB's sister branch in DSHEFS. HHEs are similar to Epi-Aids in that they typically involve on-site data collection through interviews, data abstraction from administrative and medical records, and industrial hygiene measurements; data analysis; and the recommendation (implementation) of appropriate control measures. The SB works with HETAB to provide

opportunities for its EISOs to participate in HHEs. The SB and DSHEFS leadership are supportive of EISOs participating in both domestic and international Epi-Aids. For example, the current SB EISO has participated in Epi-Aids that investigated an outbreak of Hepatitis A in Louisville, Kentucky and the epidemiology of injuries associated with the use of public electric scooters in Austin, Texas.
The SB offers many opportunities for an EISO to collaborate with public health partners. The SB is responsible, in conjunction with the Council of State and Territorial Epidemiologists (CSTE), for coordinating the efforts of 26 state health department-based occupational health surveillance programs funded by NIOSH to report on a set of 24 state-based occupational health indicators. The SB EISO will have the opportunity to work with these state programs, as well as with CSTE. Previous EISOs have also collaborated with individual states to help them analyze data from their occupational health programs and to perform occupational health-oriented analyses of data from their notifiable disease surveillance systems. There are other opportunities for working with state and other public health partners as well. The National Occupational Mortality Surveillance System (NOMS), Adult Blood Lead Epidemiology and Surveillance (ABLES) and the Sentinel Event Notification System for Occupational Risk (SENSOR) pesticides surveillance programs are all conducted in cooperation with state partners and represent further opportunities for collaboration. In addition, there are other projects in the branch that involve external partners"”including one involving surveillance of injuries and exposures among EMTs and paramedics that is conducted in cooperation with state EMS authorities"”where the officer can collaborate. Previous EISOs have also collaborated with states by working with programs in other CDC centers that have state partners (e.g. the National Violent Death Reporting System [NVDRS] and the State Unintentional Drug Overdose Reporting System [SUDORS]) and used their data to investigate associations between reportable conditions and work.
Proposed Surveillance Project:
Surveillance systems are the bread and butter of the Surveillance Branch (SB). There are a number of well-established surveillance systems operated by the SB including the ABLES program, the NOMS, the SENSOR pesticide surveillance system, and others. While most of these systems have been evaluated at some point in the past, repeat evaluations to determine continued effectiveness or characterize the effect of changes in methodology or data sources are considered useful and are welcome. The branch also operates newly developed surveillance systems that have not yet been formally evaluated. One such is a new system for national surveillance of Health-Related Workplace Absenteeism using population-based survey data. EISOs in the SB also have the option to evaluate systems operated by the various state health departments that NIOSH funds to conduct occupational health surveillance. The SB EISO will be given considerable latitude to select the surveillance system they want to evaluate based on their personal interests.
Current Position Data:
Data for most projects are owned by CDC and are available for analysis. Examples include industry and occupation-coded BRFSS data and data from the occupational health supplement to the 2015 NHIS. For the remaining projects, NIOSH has agreements that permit use of the data for research purposes. Examples include industry and occupation-coded state mortality data, EMS response data from two states, and state-based adult blood lead and pesticide exposure data. The SB also has a database containing millions of records of employment-related audiometric tests. These data can be analyzed to explore various aspects of the epidemiology of occupational hearing loss.
Position Strengths: Attentive supervisory support, broad and interesting range of projects tailored to the preferences of the officer, opportunity to establish new CDC policies, family friendly work environment, safe and affordable city, confidence that all EIS requirements can be completed promptly.
Staff & Resources: DSHEFS SB has >35 staff professionals including four EIS alumni, medical officers, epidemiologists, statisticians, industrial hygienists, IT specialists, and informaticians. As with other researchers in the SB, the EISO is provided a private office, not a cubicle, as their workspace. Administrative support and computer hardware/software are provided.
Special Skills Useful for this Position: Training in epidemiology and statistics is vital. Interest in protecting worker health is also crucial. Knowledge of SAS is desirable, but training can be provided. Excellent communication skills are a benefit.
Domestic Travel: 10% **International Travel:** 0%

NIOSH-RHD-SB-West Virginia-2019-01

Primary Supervisor: Scott Laney, Epidemiologist, EIS 2006

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Secondary Supervisor(s):

- David Blackley, Epidemiologist, Team Lead, EIS 2013
- Cara Halldin, Epidemiologist, Team Lead, EIS 2011

Background: The Respiratory Health Division (RHD) at NIOSH conducts research and public health investigations of occupational lung diseases through its two branches: Surveillance Branch and Field Studies Branch. This position is primarily based in the Surveillance Branch; however, an EIS officer matched to this position could also pursue projects in the Field Studies Branch, depending on the officer's interests. The Surveillance Branch examines ongoing surveillance data, e.g. from death certificates, national and state surveys, state-based surveillance activities, and a surveillance program that it conducts for coal miners in the U.S. It is also the locus for developing better means of medical surveillance of workers, such as digital radiography and serial spirometry tests. The Surveillance Branch collects medical test data on coal miners across the nation; certifies physicians in reading chest radiographs for pneumoconiosis; and certifies courses for instruction in quality spirometry. Occupational lung disease is the most common of the illnesses associated with work conditions, and occupational health is a relatively under-resourced area of public health, considering that most adults spend one-third of their time at work. Opportunities abound to describe new or worsening occupational diseases (e.g. resurgence of black lung disease) and old diseases in new industries (e.g. nanotechnology).

Current Work: Discovering a hidden epidemic of severe black lung disease. Establishing a post hurricane related disease surveillance system in Puerto Rico. Uncovering regulatory failures which led to the largest epidemic of progressive massive fibrosis ever recorded. Responding to the largest pandemic of Ebola the world has ever known.

Proposed Initial Projects: Recent reports have demonstrated an increase in prevalence of severe pneumoconiosis including progressive massive fibrosis (PMF) in US coal miners. This has garnered widespread attention including a Pulitzer Prize-winning investigative journalism series, Congressional hearings, federal rulemaking, and most recently the report of a previously unidentified outbreak of PMF in eastern Kentucky coal miners. The EISO will investigate to characterize the ongoing outbreak (including analysis of national medical surveillance data and field-based data analysis in clinics) in terms of disease burden, clinical characteristics, and health outcomes.

Proposed Analytic Project:

The Respiratory Health Division (RHD) at NIOSH conducts research and investigations of public health importance. For public health interventions that most immediately improve quality and quantity of life, policy initiatives and regulatory and legal changes that impact the US workforce, and public health action our Division most often uses basic epidemiologic methods and common sense. When those basic fundamentals are insufficient the Division will utilize multivariate modeling, time-series modeling, and analyses of effect modification when necessary to achieve the primary goals of improving public health. RHD administers or has access to multiple databases each with observations in the multi-millions. As one example, RHD administers the Coal Workers' Health Surveillance Program which has collected longitudinal health information and the results of medical screening on the entire population of US coal miners for 50 years. With well over 1,000,000 observations and 2,000 points of information for each (and protocols and approvals, including IRB and OMB, already in place) the prospective officer should have no concern that they will be able to achieve the analytic project requirements.

Proposed Field Investigation Project:
Health hazard evaluations offer the EISO the opportunity to lead a public health investigation. Evaluations encompass respiratory health assessments using tools such as structured questionnaires, pulmonary function tests, radiographic imaging, and allergy testing; and exposure assessments that can include job history, air sampling for dust, metals, volatiles, and bioaerosols, and exposure biomarkers in blood and urine. The EISO will use the data collected to model the exposure-response relationship with support from the branch's experienced programmers, statisticians, and epidemiologists. Current investigations an EISO could immediately join include first responders exposed to a plastics warehouse fire and an automotive rubber manufacturing facility.
An EIS officer in this position will have ample opportunity to collaborate with a variety of public health partners. In recent years, EISOs in RHD have regularly collaborated with a variety of federal agencies, state public health departments, public and private clinics, universities, industry, and workers. All recent EISOs have traveled extensively, domestically and internationally, to support and lead components of public health responses to Hurricane Maria, the largest Ebola outbreak in history, and polio eradication. Participation in these responses involved collaborations with numerous international aid groups, United States Agency for International Development, World Health Organization, and Ministries of Health.
Proposed Surveillance Project:
The RHD Surveillance Branch has numerous surveillance opportunities that the EISO can pick from, including: coal worker surveillance data query system utility, mortality surveillance of pneumoconiosis and co-mortality from other diseases, assessment of various sources of morbidity, mortality, and workers' compensation data for coal workers' pneumoconiosis (including site visits with stakeholders), utility of industry and occupation in medical record surveillance, utility of occupational health indicators for state-based surveillance, utility of MarketScan data for occupational lung disease surveillance.
Current Position Data:
NIOSH has developed, staffed, and implemented an Enhanced Coal Workers' Health Surveillance Program (ECWHSP). The ECWHSP uses a specially designed mobile medical examination unit to conduct surveys across the nation at times and locations that are convenient to coal miners. Screening includes work histories, spirometry testing, and chest radiographic examinations.

RHD responds to requests from employers, current employees, or their authorized representatives, to conduct on-site investigations of reported respiratory hazards in their workplaces. This work includes evaluation of the frequency and severity of respiratory diseases using epidemiological methods, environmental assessments, industrial hygiene sampling, medical testing, laboratory research, and data analysis.

Position Strengths: The RHD Surveillance Branch provides a Center position outside Atlanta, home to a large university with adjunct faculty opportunities; in-depth expertise of mentors; international recognition of world-class science and potential impact at individual workplaces and nationally; travel typically planned weeks in advance. Participation in other CDC assignments during EIS, such as Epi-Aids, disaster response, and international deployments, is fully supported.
Staff & Resources: 90-person multidisciplinary division; clerical and statistical programming support; field teams to collect medical testing and exposure data; laboratory collaboration to supplement epidemiologic work with genetics, animal toxicology, and exposure characterization.
Special Skills Useful for this Position: Research benefits from quantitative and logical thinking. Field work benefits from personal skills in communication with workers from diverse educational levels and racial/ethnic groups. The primary skill we seek is candidates who are more or less normal and nice. Depending on skills, EISOs pick among projects playing to their skills, interests, and need for experience.
Domestic Travel: 10% **International Travel:** 5%

Field Based Assignments

Division of Scientific Education and Professional Development / Epidemiology Workforce Branch

The Epidemiology Workforce Branch (EWB) serves as the home CIO for officers assigned to non-CDC based positions in state and local health departments. These "field" assignments provide an opportunity to work on front-line investigations and projects in many topic areas, providing broad training. EISOs gain valuable experience working on current public health issues, are vital members of the public health team, and have direct interaction with the community. Each position is unique; EWB supports all field officers and provides access to CDC's epidemiologic, statistical, and laboratory expertise. Field EIS alumni have served as State Epidemiologists; CDC Branch, Division, and Center Directors; public health professionals in local, state, federal, and international health agencies; clinicians, teachers, and researchers. Field EIS assignments provide an invaluable frontline experience whether you're interested in a career inside or outside CDC.

DSEPD-EWB-Alaska-2019-01

Primary Supervisor: Louisa Castrodale, Epidemiologist (Infectious Disease Program Manager), EIS 1999

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Secondary Supervisor(s):

- Joseph McLaughlin, State Epidemiologist, SOE Section Chief, EIS 2001
- Kim Porter, Epidemiologist (CEFO), EIS 2010

Background: The Alaska Division of Public Health (ADPH) aims to achieve a future in which Alaskans enjoy optimum health and safety through attaining greater public, community, and personal responsibility for healthy conditions and choices. The Section of Epidemiology (SOE), a unit within the ADPH, is responsible for infectious disease, environmental, and injury surveillance across the state. Additionally, SOE staff respond to infectious disease outbreaks and acute environmental exposures in Alaska, and provide immunization resources statewide. The EIS position is with the Infectious Diseases Program within the SOE, but the officer has the opportunity to work across the Section, and with other sections within the ADPH. SOE has a history of consistently providing EISOs with an outstanding training experience since the 1970s, and all 3 supervisors did EIS in Alaska. With no counties or local public health authorities, ultimate responsibility for responding to outbreaks and other public health situations rests at the State level, providing; this provides the EISO with a unique opportunity to be on the front lines of public health. Alaska EISOs are well-trained to perform autonomously and as integral members of any applied epidemiology team.

Current Work: Trichinellosis associated with consumption of walrus meat
Large mumps outbreak in Anchorage
Fatal and nonfatal injuries in the Alaska logging industry
Investigation of an Alaskan infected with a novel Orthopoxvirus
Investigation of emergency department visits associated with synthetic cannabinoids
Outbreak of campylobacteriosis associated with consumption of raw peas

Proposed Initial Projects: Given the breadth of opportunities available, past EISOs have chosen projects based on personal interests. Any of the analytic and surveillance system analysis projects listed above could be started within the first month of the Officer's arrival in Alaska.

Proposed Analytic Project:

1) Use molecular and epidemiologic tools to evaluate occurrences of "repeat" tuberculosis infection to determine if these cases represent re-exposure to TB versus re-activation. Multivariate analyses of risk factors

for reinfection are needed to better understand the unique epidemiology of TB in rural Alaska. The Section of Epidemiology has a robust TB database that is ready to be used for this purpose when the officer arrives.
2) Design and implement a research protocol to better understand the health sequelae of botulism among those who survive foodborne botulinum intoxication.
3) Link NAS (neonatal abstinence syndrome) cases with early intervention data and other data sources to assess birth and child health/behavior. Analyze data from medical record abstractions; link NAS cases with early intervention data and other data sources to assess birth and child health/behavior outcomes.
4) Estimate FAS/D (fetal alcohol syndrome/disorder) prevalence in Alaska. Would require sampling, data collection, data analysis/modeling, and manuscript development. Could also be initiated among localized populations like the Juvenile Justice population and compared with national research.

Proposed Field Investigation Project:
EISOs in Alaska have had multiple opportunities to participate and lead field investigations. There are no true county-level health authorities in Alaska; the small, closely knit Section of Epidemiology has direct statewide responsibility for conducting outbreak investigations. Recent field investigations include an E. coli O157:H7 outbreak in a prison in Nome, an outbreak of invasive Haemophilus influenzae cases in a village in Southwest Alaska, and a large contact investigation prompted by a case of active tuberculosis documented in a worker in a fish processing facility. All those investigations involved travel outside of the Officer's duty station (Anchorage). Additionally, the current EISO took the lead in investigating a large (>300 confirmed cases) mumps outbreak in Anchorage. This involved both data analysis and field investigation/outreach activities throughout the city. The EISO conducted multiple media interviews and published an MMWR article on this investigation. Additionally, in 2018 Alaska hosted staff from CDC for an Epi-Aid to assess an increase in syphilis among men who have sex with men.
There are opportunities to collaborate with local CDC offices (the DGMQ quarantine station, the NCEZID Arctic Investigations Program [AIP], and the NIOSH Alaska field station). Past collaborations have included co-leading a large investigation of invasive group A streptococcal infections with AIP and assisting with medical record review for fishing injuries with NIOSH. Additionally, Alaska EISOs have also participated as on-site investigation resources for several Epi-Aids, such as a nutritional survey of National Park Service installations, and working with NCEH Vessel Sanitation Program on acute gastroenteritis outbreaks aboard cruise ships.
Proposed Surveillance Project:
Elevated blood lead levels are conditions reportable to the Section of Epidemiology. Regulation changes are underway to reflect updated cut-off levels of concern. An evaluation of the existing surveillance data and system in light of impending changes to the cut-offs (as well as to a newer database) is desired to better understand screening practices and guide improvement to overall surveillance for elevated blood lead in Alaska. This project would be primarily based in the office, though there may be opportunities to travel with environmental health staff throughout the state to promote lead screening.

Another potential project is to evaluate the impact of CIDT (culture-independent diagnostic tests) on surveillance for enteric diseases. Some CIDT-positive samples are sent for a reflex culture to enable further molecular evaluation; however, many are not. Understanding the impact of the increasing use of this technology in generating morbidity estimates is desired to assess the ability to detect additional clusters or improve the timeliness of cluster detection.

Many additional surveillance projects are available and can be tailored to the Officer's interests. Examples include the hospital discharge surveillance, syphilis surveillance, paralytic shellfish poisoning surveillance, Alaska's immunization information system, suicide surveillance, and drug overdose death surveillance.
Current Position Data:
In the Section:
- Reportable infectious disease data

- Immunization Information System (registry) data
- Violent death data
- Firearm injury surveillance data
- Drowning surveillance data
- Prescription and illicit drug overdose surveillance data
- Lead data
- Hair mercury data

In the Division:
- Alaska Trauma Registry
- Youth Risk Behavior Survey (YRBS)
- Behavioral Risk Factor Surveillance System (BRFSS)
- Birth Defects Registry
- Pregnancy Risk Assessment Monitoring System (PRAMS)
- Childhood Understanding Behaviors Survey (CUBS)
- Health Facilities Data Reporting (HFDR)
- Vital Records

Position Strengths: Frequent opportunities to investigate outbreaks, respond to health concerns in remote Alaska villages (where travel may require small airplanes, boats or four-wheelers), and work with some of the most preserved indigenous cultures in the US. EISOs frequently interact with health care providers, media, and the general public offering experience to hone written and oral communication skills. Alaska EISOs who are so inclined have numerous opportunities to appear on local TV and radio news. EISOs have had no trouble fulfilling CALs. Supervisors support an international deployment through CDC, should the opportunity arise.
Staff & Resources: Former EIS officers, clinical scientists, PhD-level epidemiologists, and nurse epidemiologists are available for guidance and support. EISOs have their own office, computer support, access to the University of Alaska's biomedical library, and state public health (BSL3+), and environmental laboratories.
Special Skills Useful for this Position: Flexibility, ability to multitask, basic epidemiology and biostatistics knowledge, strong writing skills.
Domestic Travel: 5% **International Travel:** 0%

Field Assignment Description

Size of Community: Statewide ~740,000 persons; Anchorage ~300,000 persons
University Affiliation: University of Alaska Anchorage's MPH and Nursing Programs, and the WWAMI collaborative medical school offer EISOs opportunities to guest lecture in various courses.
Living Environment: Anchorage is the largest city in Alaska, with all of the amenities of city life, including great neighborhoods and restaurants. The Ted Stevens International Airport offers direct flights from Anchorage to many locations, including Chicago, Denver, Hawaii
Cultural and Recreational Assets: Alaska has tremendous recreational assets year-round, including extensive local trail systems for running, cycling and skiing; nearby access to alpine skiing, mountaineering, trail-hiking, kayaking, rock/ice climbing, skating, paragliding, birding, fishin
Opportunity for Partners' Employment: Opportunities abound in Anchorage.

DSEPD-EWB-California-2019-01

Primary Supervisor: Pennan Barry, Chief, Surveillance and Epidemiology Section, Tuberculosis Control Branch, EIS 2005

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Secondary Supervisor(s):

- James Watt, Chief, Division of Communicable Disease Control, EIS 1999
- Shua Chai, Career Epidemiology Field Officer, EIS 2006

Background: The Division of Communicable Disease Control (DCDC) is responsible for monitoring, preventing and controlling communicable diseases in California. This position is situated with the tuberculosis control branch, but will work on a variety of communicable disease projects. DCDC has approximately 400 professional staff with diverse scientific experience, including Masters and PhD level epidemiologists, physicians, nurses, veterinarians, disease investigators, health educators, behavioral scientists, and laboratorians. Many projects involve significant laboratory partnership. DCDC collaborates with many other programs, and opportunities in other areas, such as HIV/AIDS and health care associated infections, may be available.

The primary supervisor, Pennan Barry, oversees the EIS experience, helps link the officer with experienced leads in other programs, and provides tuberculosis subject matter expertise. The secondary supervisor, James Watt, is the DCDC Chief and is responsible for identifying project opportunities in other infectious disease areas and for providing exposure to high level public health management and policy issues. Each project will also have a specific project supervisor. Shua Chai provides epidemiologic training experience, and Adam Readhead and Erin Murray provide statistical and analytic guidance. This model provides a wide diversity of communicable disease control experiences and the opportunity to work with experts in different disease control programs.

Current Work: Analytic: Area-based socioeconomic status measures and TB incidence by country of birth

Surveillance: Evaluation of electronic laboratory reporting of interferon gamma release assays for latent TB infection surveillance; Legionella surveillance evaluation

Outbreak investigations: Coccidioidomycosis in environmental workers; Echovirus30 meningitis cluster; Norovirus outbreak in shelters for wildfire victims

Proposed Initial Projects: We would recommend starting with the surveillance evaluation project because it is timely, ready to go, and is a good introduction to TB control partners and the California reportable disease surveillance system. In addition, the analytic project on risk factors for central nervous system TB and death is ready to start upon arrival. Other projects involving communicable disease surveillance data could be started within the first month of the assignment because data is are readily available. We will aim to get the officer involved in a field investigation as soon as a good one comes up.

Proposed Analytic Project:

-Use data on patients hospitalized with influenza matched to death certificate data to identify deaths not attributed to influenza. Conduct multivariable analysis to identify predictors for not having influenza reported as a cause of death.

-Analyze the

Proposed Field Investigation Project:

There are many field investigation opportunities with primary data collection. There are many opportunities to lead a foodborne disease outbreak investigation or an investigation of an occupational coccidioidomycosis outbreak. Previous officers have led outbreak investigations including a hantavirus outbreak, outbreaks of enteroviral illness (meningitis, acute flaccid myelitis), an outbreak of bloodstream infections in dialysis centers, an outbreak of meningococcal disease on a college campus, and STD outbreaks. In addition, there are opportunities for primary data collection to investigate ongoing communicable disease issues such as increases in syphilis and pertussis. We also support participation in domestic or international Epi-Aids/emergency response deployments for interested EISOs.

CDPH works closely with 61 local health jurisdictions, along with other state and federal partners and thus provides an excellent setting in which to learn how to develop and maintain collaborations essential for public health practice. EISOs are frequently welcomed in local health departments as part of field investigations, surveillance evaluations, and analytic projects. In addition, the EISO has the opportunity to work with and present to local health jurisdiction staff through workgroups and conferences of California TB Controllers

Association, California Conference of Local Health Officers, and others. EIS Officers have the opportunity to visit partner facilities such as CDC Quarantine Stations and state prisons.

CDPH also collaborates with the University of California, particularly the U.C. Berkeley School of Public Health, the U.C. San Francisco School of Medicine, and U.C. Davis. The EISO can take advantage of academic research meetings, engaging research collaborators on specific topics, and presenting at a U.C. Berkeley School of Public Health Course taught by CDPH staff.

Proposed Surveillance Project:

A new requirement for reporting latent TB infection (LTBI) among persons applying to adjust their immigration status from temporary to permanent went into effect in October 2018. The requirement provides an opportunity for local health departments to identify LTBI in a population at risk for TB in order to link them to treatment and prevent future active TB cases. CDPH set up an electronic system to allow physicians performing immigration medical exams to report to local health departments. The surveillance evaluation will involve assessing the data reported into the CDPH system as well as in-person or telephone interviews with local TB control programs and reporting physicians. There is also an opportunity to survey stakeholders about the system. Because the system is new, the surveillance evaluation will be crucial for local and statewide improvement as well as of interest nationally.

Current Position Data:

All communicable disease surveillance data in California, California Emerging Infections Program data, molecular data from an extensive laboratory collection, immunization coverage and delivery data, program performance data from 61 local health jurisdictions, outbreak data, hospital discharge and cost data, and others are available and accessible within the first month of the assignment.

Position Strengths: Wide range of scientific opportunities, large and diverse population, range of communicable diseases, extensive experience of staff, and opportunity to work directly with subject matter experts on a variety of projects.

Staff & Resources: Ample administrative support, including for travel and IT needs, and also analytic support for geocoding, SAS, R, and Access. Advanced statistical support is available in-house. Specialized resources (e.g., cost-benefit analysis) are available through ties with UC Berkeley and UCSF.

Special Skills Useful for this Position: EIS officers in the DCDC have had a range of different backgrounds including physicians, veterinarians and PhD epidemiologists. The most important skills for this position are creativity, enthusiasm, and the ability to work both independently and as part of a team. We have a diverse range of opportunities and are open to officers from different professional backgrounds.

Domestic Travel: 5% **International Travel:** 0%

Field Assignment Description

Size of Community: California is an extremely diverse population of over 39 million persons with a vast range of demographic, cultural, geographic, climate, and environmental factors which affect the epidemiology of infectious diseases in this state.

University Affiliation: University of California (UC), Berkeley; UCSF, UC Davis, Stanford.

Living Environment: The Richmond CDPH campus is about a 15 minute drive from Berkeley/Oakland and easily accessible by rapid transit and bicycle; staff live all over the San Francisco Bay Area from the more affordable areas north and east of Berkeley/Oakland to San Francisco

Cultural and Recreational Assets: The Bay Area is an incredibly culturally and ethically rich diverse metropolitan center with the added benefit of being in a beautiful accessible and natural environment.

Opportunity for Partners' Employment: Good

DSEPD-EWB-California-2019-02

Primary Supervisor: Eric McDonald, Medical Director

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Secondary Supervisor(s):

- Kathy Moser, Medical Officer/Team Lead
- Elsa Villarino, Epidemiologist, Medical Officer, Team Lead, EIS 1995

Background: This is a joint position with the San Diego County Health and Human Services Agency (local county health department) and the US-Mexico Unit, CDC Division of Global Migration and Quarantine (USMU DGMQ). The units are collocated in the same office suit and have a collaborative history extending over two decades. The County Epidemiology and Immunization Services Branch conducts timely surveillance, investigation, and intervention to protect community health, prevent spread of disease, and provide relevant information through data collection and analysis to the public and key partners. Reportable conditions are notified to the Branch, which works with other health agencies, private providers, and the public to take required actions. The County TB and Refugee Branch, and the HIV, STD, Hepatitis Branch conduct similar activities for diseases under their purview.

USMU's mission is to improve and promote the health of populations living within and travelling through the US-Mexico border regions as well as broader binational populations. Their work is accomplished through science, partnerships, policy, preparedness and response. USMU works with federal, state and local health agencies on both sides of the border, as well as relevant partners and communities to monitor, investigate and implement strategies to address diseases of public health concern.

Current Work: Projects include: outbreak report of wound botulism among people who use black tar heroin; assessing homelessness as a risk factor for hepatitis A infection and severe disease; assessing hepatitis A case classification with machine learning; assessing the response to hepatitis A cases among food handlers; assessment of binational case surveillance.

Proposed Initial Projects: 1) Quantification of incoming land-border crossings for preparedness and disease exposure risk assessment through collaboration with Customs and Border Protection datasets;

2) Analysis of health disparities among foreign-born populations in the U.S. using national survey data (e.g., NHIS). Data will be analyzed using complex survey and multivariate modeling methods;

3) Use spatio-temporal methods to define patterns of binational disease reporting and/or tuberculosis patient movement across borders;

4) Analysis of syndromic reporting and reportable condition notification to southern border CDC stations to refine partner collaboration in disease control efforts.

For each project, existing protocols will be used/modified to permit rapid start-up.

Proposed Analytic Project:

Please see the proposed projects listed below under surveillance and initial projects. This EISO position has been filled by various professionals from different disciplines (MD, PhD, ScD, RN, DVM) with varying epidemiology backgrounds. Projects will be tailored to the level of the EISO. For example, multivariate analysis has been utilized by nearly all officers on existing databases, while a previous officer with a strong modeling background developed a hepatitis A epidemic model with local academic partners and the incumbent officer utilized machine learning algorithms to test CSTE case definitions for hepatitis A. There is an established database on the recent hepatitis A outbreak in San Diego, and there are several opportunities to analyze this for efficacy of post-exposure prophylaxis, implications for occupational health recommendations, correlating geospatial information with strain type, etc.

Proposed Field Investigation Project:

The field investigation CAL can almost always be filled by emerging communicable disease issues in San Diego County. All EISOs are trained to respond as County epidemiology duty officers and participate in routine investigations of reported diseases during their duty time. The EISO would interview and extract data from medical records, analyze data, prepare reports and participate in public health response activities. Previous EISOs have done this work and published articles on outbreaks and individual case reports of these emerging

diseases. Recent examples include a large hepatitis A outbreak in homeless and illicit-drug using populations, a large STEC outbreak in a military population, an outbreak of wound botulism in black tar heroin users, secondary and tertiary transmission of vaccinia from vaccinated persons, and pertussis and influenza outbreaks in unique populations. In these investigations, the EISO will be expected to work with state, military, tribal, Mexican, local health system, and NGO partners as needed. We will support our EISO in participating in Epi-Aids and/or emergency response deployments that they may wish to participate in. Prior EISOs have deployed to Rwanda/South Sudan (Ebola), American Samoa (Zika), Puerto Rico (Zika), and West Africa (Ebola).
The EISO woul d primarily interact with public health partners through field investigations in the San Diego region. The unique nature of the joint position in a local health department and a CDC field unit ensures that nearly all projects and investigations are collaborative. Activities are likely to include military, tribal, local health system, academic, research, and NGO partners, especially those involved with refugee and migrant/asylum seeker health. Most previous EISO's have taught and supervised MPH students from San Diego State University Graduate School of Public Health and all have participated in the annual San Diego Epidemiology Research Exchange.
In addition, CDC activities regularly provide opportunities for partner interactions outside the San Diego area. Recent examples include assessment of a State of Arizona binational surveillance system, international trip to Mexico with federal and local rickettsiosis partners, and trip to Africa for Ebola preparedness assessment with ministry officials.

Proposed Surveillance Project:
Options include:
1) Evaluation of enhanced surveillance of Cryptococcus spp. in San Diego County using provider-focused surveys and active case-finding;
2) Evaluation of San Diego Immunization Registry system for capturing immunization status of newly arriving refugee populations through assessment of the refugee entry database (EDN), immunization registry data, and provider-focused interviews;
3) Evaluation of the San Diego Immunization Registry as a surveillance tool for latent TB infection, review of existing registry data and site visits to county clinics;
4) Evaluation of existing tool for identifying dairy product ingestion in food-borne illness, using field observation, worker-focused surveys and desk-based review of TB surveillance system;
5) Evaluation of Hepatitis C surveillance as part of a multi-disciplinary team of community stake holders convened to develop an action plan to eliminate transmission in San Diego by 2025.

Current Position Data:
Computerized laboratory, notifiable disease, and syndromic surveillance systems. Electronic health records and Health Information Exchange data. Federal Quarantine Activity Reporting system, CureTB international referral data; Electronic Disease Notification system for immigrant/refugee medical examination data. Data are accessible and available for projects from initiation of assignments.
Position Strengths: Local and federal: work with a large health department and a busy CDC field unit. Large, diverse population with varied infectious disease morbidity. Can work with TB and HIV/STD units and engage in international/binational health issues. Strong emphasis on epidemiologic work resulting in publications.
Staff & Resources: The resources available from the County of San Diego include a designated workspace with computer and phone support, to include all available statistical analytic packages and software to perform epidemiological work (SPSS, R, SAS, Microsoft products, etc.) Administrative analyst support is provided, and the EISO will have access to County subject matter experts and senior epidemiologists among the 50 County employees and contractors in the Epidemiology and Immunizations Services Branch.
Special Skills Useful for this Position: Due to the binational nature of work in San Diego, a working knowledge of Spanish is useful, but not required.
Domestic Travel: 10% **International Travel:** 10%

Field Assignment Description

Size of Community: 3.3 million people live in San Diego County; 2 million people in Tijuana (sister Mexican city)
University Affiliation: San Diego State University Graduate School of Public Health; University of California San Diego School of Medicine, Department of Family Medicine and Public Health.
Living Environment: Attractive multicultural, metropolitan and coastal area. San Diego is a border community with a lengthy coastline, an exciting metropolitan area, and desert and mountain terrains making it the most biologically diverse county in the nation.. The office i
Cultural and Recreational Assets: Major theater, opera, and symphony. Abundant outdoor recreation with beaches, mountains, and deserts close by. World famous zoo. Balboa Park museums and gardens. See: https://www.sandiego.org/
Opportunity for Partners' Employment: Science/biotech and military hub with several major universities/academic institutions and hospitals.

DSEPD-EWB-Colorado-2019-01

Primary Supervisor: Bernadette Albanese, Medical Epidemiologist, Tri-County Health Department

- balbanese@tchd.org

Secondary Supervisor(s):

- Rachel Herlihy, State Epidemiologist; Communicable Disease Branch Chief, Colorado Department of Public Health and Environment (CO-PRIMARY supervisor)
- Wendy Bamberg, Medical Epidemiologist, Healthcare-Associated Infections and Antimicrobial Resistance Program Manager, Colorado Department of Public Health and Environment, EIS 2005

Background: This COMBINED state/local position is between the Colorado Department of Public Health and Environment (CDPHE) and Tri-County Health Department (TCHD, the largest local public health agency in CO serving 3 metropolitan Denver counties). We have a long history of interagency collaboration and years of experience individually supervising EISOs. Our goal is to provide the EISO with the unique experience of working at the state and local level. EISO projects/investigations can focus on communicable disease, environmental health, chronic disease, surveillance, and epidemiology.

EISO time is integrated between two agencies located 8 miles apart. Dr. Albanese and Dr. Herlihy are co-primary supervisors; Dr. Bamberg and Dr. Jennifer House are secondary supervisors. At CDPHE, the EISO is based in the Communicable Disease Branch, which conducts surveillance, investigation, prevention, and control for foodborne, zoonotic, vaccine preventable, and respiratory diseases, tuberculosis, and healthcare-associated infections. Collaboration occurs with STIs/HIV/hepatitis, environmental health, and chronic disease programs. At TCHD, the EISO is based in the Planning and Information Management Division (epidemiology, informatics, health planning). Opportunities exist to work within communicable disease, epidemiology, environmental health, chronic disease, and maternal child health. CDPHE and TCHD frequently collaborate around investigations/outbreaks; the EISO can broaden experience beyond communicable diseases, particularly at TCHD.
Current Work: Investigations/projects: hantavirus in Denver; hepatitis A among MSM; Serratia-contaminated medication; Q fever at raw milk dairy; roundworm at organic farm; group A Streptococcus among people experiencing homelessness or who inject drugs; measles cost analysis; syndromic surveillance for marijuana adverse effects; syphilis screening during pregnancy; Zika knowledge assessment survey (Dominican Republic).
Proposed Initial Projects: Initial projects for EISOs could be selected from any of the proposed analytic projects or surveillance evaluations, as these are ready for analysis, or be an outbreak investigation (which typically occurs early in the EISO's assignment, as described above). The interest of the EISO will be paramount to

deciding initial projects, in consultation with primary and secondary supervisors, to guide the EISO in selecting project(s) that align with the EISO's background, training, and growth opportunities.

Proposed Analytic Project:

Proposed projects can be tailored to the interest of the EISO. Analytic support is available on-site at both CDPHE and TCHD from experienced epidemiologists, and potentially with epidemiologists at the Colorado School of Public Health; SAS training can be provided if needed.

Initial proposed analytic projects could include:

- Analyze data from a longitudinal, population-based maternal surveillance system measuring vaccine hesitancy "" a new Colorado surveillance system that is the first of its kind in the U.S. The EISO would analyze data from surveys completed in 2018 and examine rates and geographic patterns of vaccine hesitancy; representativeness of surveyed population; cross tabulation with other health behaviors (access to healthcare, breastfeeding, substance use). This project can be combined with a surveillance evaluation of this system.
- Analyze Denver metropolitan Clostridioides difficile surveillance data during 2009-present to understand the effect of PCR testing on disease burden. Data sets and sample SAS code are prepared for analysis.
- Assess youth suicide in TCHD's jurisdiction during 2016-2018. Analyze data from vital statistics, National Violent Death Reporting System, county coroners, child fatality review team. Measure suicide trends and clusters, and describe risk factors and circumstances surrounding death.
- Perform a geospatial analysis of sexually transmitted infections (STI) in TCHD's jurisdiction during 2016-2017. Use geographic information systems (GIS; supported at TCHD) to identify local clustering of cases; correlate with socioeconomic factors and access to STI services.
- Other data sets (e.g., legionellosis, varicella, E. coli O157) at CDPHE are available for complex analyses per EISO interests.

Proposed Field Investigation Project:

Previous EISOs at CDPHE and TCHD had multiple opportunities to lead and assist with outbreak investigations, typically meeting this CAL early in their assignment and many times thereafter. Specific topics will depend on the outbreaks that occur (whether managed by CDPHE, TCHD, or by both agencies). Previous EISO examples of communicable disease-related field investigations include Salmonella in guinea pigs, typhoid fever associated with a restaurant, mucormycosis in a bone marrow transplant unit, cryptosporidiosis in an animal research laboratory, mumps in a Marshallese population, and hepatitis A in men who have sex with men (MSM). The EISO will obtain plentiful experience in outbreak response and gain skills in data collection/analysis, planning, communication, and collaboration through the lens of both state and local public health agencies.

Depending on EISO interest, other opportunities exist beyond outbreak investigations for projects that meet this CAL, including the following:

- Assess the timeliness and completeness of human rabies exposure reporting from emergency departments in TCHD's jurisdiction. Use syndromic surveillance to identify missed reports of rabies exposure, assess misuse of rabies postexposure prophylaxis (PEP), and evaluate excess costs related to incorrect PEP following animal bites. Communicate findings to emergency department leadership.
- Build a process for environmental health monitoring from potential exposure to a known hazardous substance contaminated-site (proposed for land reuse/redevelopment) in TCHD's jurisdiction. Visit the site, compile data on environmental spills, well water contamination, septic systems, or human testing. Develop plan for collecting data for health monitoring after environmental mitigation.

Opportunities abound at CDPHE and TCHD, depending on EISO interest:

- EISO can lead or participate in multifaceted projects; learn to develop and administer surveys, conduct on-site evaluations, perform data collection/analysis, and make recommendations.

o Complex, multijurisdictional outbreak investigations; collaborate with state public health laboratory staff and environmental health staff during a foodborne outbreak; animal handlers during a zoonotic outbreak; Colorado Department of Agriculture, FDA, or USDA during a foodborne outbreak; FDA during a drug/device-related outbreak.

o Survey correctional facility partners (local, state, federal) to understand what communicable disease or public health issues impact their settings; use data to plan educational training for facilities.

o Assess long-term care facility diagnostic testing capacity for Clostridioides difficile and other healthcare-associated infections; understand how testing impacts disease transmission, surveillance, and antimicrobial use and stewardship.

- EISO can participate in community partnerships:

o Serve on the TriCounty Overdose Prevention Partnership focusing on opioid misuse prevention, naloxone distribution, safe prescription opioid disposal. EISO would research best practices to guide decision making for prevention activities.

o Participate in a public health/health care systems alliance among Denver metropolitan/rural Colorado communities targeting HPV prevention through vaccine advocacy. EISO would analyze HPV vaccination rates from immunization registries and collaborate with multiagency committee(s) to research best practices for systems change to improve vaccination rates.

o Participate in TCHD's Public Health Improvement Plan. EISO would collaborate with epidemiologists, program managers, and community stakeholders to set targets for population health measures for health care access, mental health, food insecurity, and housing.

Proposed Surveillance Project:

Multiple opportunities to evaluate surveillance systems; will tailor to the interests of the EISO.

Proposed surveillance evaluations:

- Evaluate surveillance to measure vaccine hesitancy (as described under analytic projects). Assess a novel approach of incorporating a survey of parent attitudes about vaccines into a population-based maternal surveillance system. The surveillance evaluation can be combined with the analytic project.
- Evaluate surveillance of bloodborne pathogen (BBP) detection among plasma donation centers (PDCs). Some PDCs in the Denver metro area have deficient infection prevention practices that could pose risk factors for BBP acquisition. It is unclear if current surveillance systems are adequate to detect BBPs associated with PDCs.
- Evaluate surveillance for youth suicide. When assessing state and local data sources, evaluate how systems identify risk factors and circumstances around death, and allow for access to data by stakeholders (e.g., mental health professionals and schools). The surveillance evaluation can be performed in combination with the analytic project.
- Evaluate surveillance of lead poisoning, which has both quantitative and qualitative components. Explore how lead level testing data are managed by public health. Assess childhood lead screening practices by health care providers. Additional projects could follow from this evaluation related to Medicaid lead screening policies and outcomes of home-based lead mitigation efforts by local public health agencies.

Other surveillance systems that could be evaluated include: acute flaccid myelitis/enterovirus; nontuberculous mycobacteria (newly reportable in 2019); carbapenemase-producing carbapenem-resistant organisms; respiratory syncytial virus (newly reportable in 2019); impact of new national outbreak definitions for healthcare-associated infections.

Current Position Data:

CDPHE and TCHD owns or accesses many data sources; users gain skills in data management.

- Colorado communicable disease surveillance system
- Enhanced, in-depth surveillance data (enterics, invasive bacteria infections, Clostridioides difficile, multidrug-resistant bacteria, pertussis, influenza). Colorado is a member of the 10-state CDC Emerging Infections Program

(www.cdc.gov/ncezid/dpei/eip/index.html) and is one of five sites for the Integrated Food Safety Centers of Excellence (www.cdc.gov/foodsafety/centers/index.html)
- Colorado outbreak database
- Zoonotic database for plague, rabies, tularemia, West Nile virus.
- Healthcare-associated infection data
- Population based surveys: BFRSS, PRAMS, Healthy Kids Colorado
- Birth/death records
- Syndromic surveillance
- Hospital discharge data

Position Strengths: We offer the best of all worlds! A combined position between the state public health agency and a nearby large local public health agency. A position that can be tailored to the EISO's interests, skills, and needs for growth; hands-on work alongside both state and local public health and laboratory professionals; dynamic, collaborative supervisors; wide-ranging choices for projects/investigations; experiences in urban and rural settings; friendly work environments with dedicated staff who love what they do; support for international work; other EISOs in Colorado. Both agencies have a solid history of training EISOs (8 since 2001 [CDPHE], 4 since 2004 [TCHD]).

Staff & Resources: The Communicable Disease Branch at CDPHE has approximately 25 epidemiologists with extensive technical expertise. Our agencies partner with knowledgeable state public health laboratory staff. At TCHD, the EISO works with experienced communicable disease epidemiologists (6), population health epidemiologists (3), as well as environmental health specialists, public health nurses, and public health program specialists. Relationships exist with Colorado School of Pubic Health. Both CDPHE and TCHD provide fundamental analytic (epidemiology, statistics, GIS) support; complex analytic support is available from CDC. CDPHE and TCHD supervisors have a close, collaborative working relationship, and staff at both agencies are welcoming and supportive of EISOs.

Special Skills Useful for this Position: No particular skills required. A successful EISO at CPDHE/TCHD has a healthy curiosity about how public health works in the field, a desire in gaining experience and learn at both state and local levels, has flexibility to engage in diverse projects/investigations, and is excited to be busy and work with a range of public health professionals. EISOs with a variety of backgrounds (medical, veterinary, nursing, PhD epidemiologists) will thrive in this position.

Domestic Travel: 10% **International Travel:** 0%

Field Assignment Description

Size of Community: Colorado population ~5.6 million;
Tri-County Health Department (TCHD) jurisdiction ~1.5 million

University Affiliation: University of Colorado, Anschultz Medical Campus. Drs. Bamberg and Albanese have adjunct faculty appointments in the School of Public Health and Dr. Herlihy in the School of Medicine. There is also collaboration with Colorado State University in Fort Coll

Living Environment: Colorado/Denver offers 300 annual days of sunshine! Colorado is heralded as an outdoor paradise, offering unparalleled, beautiful opportunities for biking, hiking, skiing, mountain climbing, camping, and fishing. Denver is a very livable city with great n

Cultural and Recreational Assets: Denver has many cultural and entertainment assets ""performing arts center, art and science museums, zoo, aquarium, botanic garden, and professional sports teams.

Opportunity for Partners' Employment: The Denver metropolitan area has major universities/colleges, schools of medicine/public health/nursing, ~20 hospitals, large high-tech corporations, and other major employers.

DSEPD-EWB-Illinois-2019-01

Primary Supervisor: Jennifer Layden, State Epidemiologist/Chief Medical Officer

- jennifer.layden@illinois.gov

Secondary Supervisor(s):

- Connie Austin, State Public Health Veterinarian, Infectious, EIS 1996
- Elizabeth Soda, CDC Assigned Medical Officer at IDPH for HAI program, EIS 2018

Background: Mission/Goals: IDPH is the state health agency that serves 12.8 million ethnically and socio-economically diverse individuals residing in a range of densely urban to deeply rural communities across the State. The mission of IDPH is to protect the health and wellness of the people in Illinois through the prevention, health promotion, regulation, and the control of disease and injury.
Structure: IDPH is organized into 10 Offices that in total run over 200 programs. There are headquarters both in Chicago and Springfield, as well as 3 state public health laboratories. The EISO will be stationed in the Chicago headquarters, and will be assigned to the Division of Infectious Diseases in the Office of Health Protection which includes Communicable Diseases, TB, Immunization, and STD/HIV Sections. These sections are responsible for state-wide disease surveillance, prevention, outbreak investigations, and control programs conducted in collaboration with 95 local health departments across the State.
Focus: Officers will have the opportunity to work on disease surveillance programs / projects, outbreak investigations, health care associated infection control and prevention efforts, as well as numerous other projects within the Office and across the Department in a multi-disciplinary team approach.

Current Work: Our current EISO has led complex and novel outbreak investigations, participated in and/or led Epi-Aids, published findings, conducted surveillance activities, and collaborated with other public health partners. Investigations have included: Mucor hospital cluster, staph scalded skin syndrome in a NICU, coagulopathy associated with synthetic cannabinoid use, and Cyclospora outbreaks.

Proposed Initial Projects: Based on current priorities, the EISO could expect to work immediately on the viral hepatitis and C. auris analytic projects, as well as start one of the surveillance evaluations. If an outbreak was occurring during the first month, the EISO could serve as a team member to become familiar with the various aspects of an investigation.

Proposed Analytic Project:
Viral Hepatitis disease burden modeling: There are growing efforts to better characterize the viral hepatitis disease burden across the state, as evidenced by our received CDC's Overdose Prevention in States grant, as well as partnerships with other NIH and CDC funded hepatitis projects. The officer can become involved with the creation of a viral Hepatitis statewide epidemiologic profile. This will include the examination of state healthcare utilization and HCV mortality rates by analyzing data from I-NEDSS cross matched with vital records, hospital discharge, and emergency department data; and a state wide vulnerability assessment. Modeling approaches for these have been previously developed.

C. auris Disease Spread: C. auris is an emerging pathogen and Illinois has a high disease burden. Significant efforts have occurred to conduct point prevalent surveys, as well as track disease incidence and spread. Analytic efforts are needed to predict which facilities are at risk for receiving colonized patients, which patients within a facility are at risk for colonization, as well as identify factors that impact transition from colonization to clinical infection. Data is collected, and multi-variate as well as time series modeling can be applied to address knowledge gaps.

Vector-borne disease spread: IDPH is a collaborating partner with the CDC funded Midwest Center of excellence. The EISO would work with this team to conduct time/space GIS mapping using multiple datasets (disease, vector-testing, weather, etc) to identify at risk jurisdictions for high burden disease incidence.

For each, data sets are available and accessible within our Agency.

Proposed Field Investigation Project:

Disease outbreak investigations: The EISO would have significant opportunities to lead or assist with outbreak investigations in the field. This would include survey and data collection instrument development, direct patient interviews, potential environmental assessments (ie-if Legionella outbreak), planning (ie-case definition development, study design development), descriptive data analyses, and investigation wrap-up activities. Examples of this past year's investigation opportunities include: measles outbreak, community based Legionella cluster, synthetic cannabinoid outbreak, fungal Mucor investigation cluster within a healthcare facility, staphyloccocal scalded skin outbreak in a NICU, as well as TB investigations.

IDPH is fully committed to provide the EISO opportunities to assist or lead investigations within the state, as well as support emergency deployments based on interest. Annually, IDPH conducts a large number of foodborne, HAI, and community based outbreaks, among other investigations.

Our current EISO led an Epi-Aid to investigate a mass poisoning associated with synthetic cannabinoid use in Illinois and was a team member for 2 other Epi-Aids.
The EISO would have ample opportunities to engage with key public health partners, including local health departments, grant partners, and University faculty.

Viral Hepatitis: IDPH partners with the University of Chicago and Chicago DPH on the CDC funded HepCATT project, as well as with the University of Chicago and University of Illinois on a NIH funded project to study hepatitis C and opioids in rural Illinois.

C.Auris and Multi-drug resistance (MDR) pathogens: IDPH partners with local health departments and CDC funded Epi-Centers (PI's at Rush University) to study and prevent C. auris and other MDR pathogens. There are bi-weekly calls, frequent in person meetings, as well as numerous technical assistance collaborations between IDPH, local health departments, and Universities/hospitals.

Vector borne disease: IDPH is a partner on the CDC funded Midwest center of excellence, which includes University partners. The EISO could participate in standing meetings, calls, as well as engage in primary data collection, and secondary data analyses.

For each of these disease areas, there are multi-stakeholder weekly calls, in person meetings, and multiple opportunities for data analytic projects, as outlined above. The EISO can become an active member in these activities.

Additional opportunities: IDPH participates in regional LHD committee meetings, providing state updates, provides frequent education webinars for LHDs, as well as quarterly newsletters. Because of relationships with University partners, IDPH colleagues also present periodically at University seminars or conferences. The EISO would participate in all these activities.

Proposed Surveillance Project:

A surveillance evaluation on one of the following systems will be conducted by the EISO and will follow standard Guidelines for evaluating a surveillance system:
1.) Legionella disease surveillance: With Legionella disease incidence increasing, and the source(s) of exposure often not identified, there is a need to evaluate how we identify cases, potential exposures, link that data across jurisdictions, and how that data is used to investigation clusters or cases.
1.) Evaluation of the surveillance of an enteric disease: (i.e., Cryptosporidiosis, shiga toxin producing E.coli) With increasing use of non-culture based molecular methods to diagnose enteric infections, an evaluation is needed to identify the impact of these methods on case definitions, case counts, submission of specimens to IDPH, sensitivity / specificity, and the Public Health usefulness of the surveillance data.

2.) Evaluation of the XDRO (extensively drug resistant organisms) surveillance system. The XDRO surveillance system works in collaboration with the Chicago CDC Prevention Epicenter, with the goal to provide rapid notification of interfacility transfer of patients with resistant bacterial infection. This surveillance project would assess the use of the registry to notify when inter-facility transfers of patients occurs, and assess its impact on prompt disease reporting.

Each of these surveillance systems is managed by IPDH and the EISO would interact directly with surveillance program leads and end users. The EISO could also work with other jurisdictions that have similar surveillance systems to comprehensively conduct the evaluation.

Current Position Data:
Illinois National Electronic Disease Surveillance System, Syndromic Surveillance, Outbreak reporting system (ORS), HIV surveillance, STI surveillance data, Hospital Discharge and Emergency Room utilization, Vital Statistics, HAI/XDRO Registry, Cancer Registry, Adverse Pregnancy Reporting System.

Position Strengths: -Experienced and diverse supervisory team
-Depth of potential opportunities, both programmatically as well as in regards to collaborations with other public health partners (LHDs, universities, community partners)
-Outbreak investigation opportunities.
Staff & Resources: Mentorship/training in statistics, epidemiology, outbreak investigation, lay communication, scientific writing and presentation will be provided by the supervisors and, as needed, in collaboration with universities and the CDC. Educational structure will be guided by but not exclusively limited to the CAL competencies. A computer, telephone, fax, office supplies and statistical software will be provided. IDPH has numerous epidemiologists with varied skill sets and a wide breadth of subject matter expertise.
Special Skills Useful for this Position: -Experience working with multi-disciplinary teams
-Adaptability, and eagerness to work on numerous projects, sometimes simultaneously
-Prior clinical work, training, or interest in this area
-Analytic skills training useful, but not required

Domestic Travel: 10% **International Travel:** 0%

Field Assignment Description

Size of Community: 12.8 Million Illinois Residents across Illinois. Illinois is a diverse state, with large urban areas, as well as rural areas. There is socio-economic, racial, ethnic, and political diversity.
University Affiliation: IDPH works closely with numerous surrounding universities, including the University of Illinois at Chicago (UIC), University of Illinois-Springfield, and University of Chicago.

IDPH has an academic health department agreement with the UIC School of Pu
Living Environment: There are numerous options in city and neighboring suburbs with easy transportation options. There are also many opportunities for employment of significant others/partners.
Cultural and Recreational Assets: Chicago is socio-economically diverse, and home to numerous museums, symphony orchestra, park systems, biking opportunities, restaurants, theatres, and professional sports teams.
Opportunity for Partners' Employment: Chicago is a large city with numerous opportunities in many different fields. There are numerous academic and health centers, and graduate programs.

DSEPD-EWB-Maryland-2019-01

Primary Supervisor: David Blythe, State Epidemiologist and Director, MDH IDEORB, EIS 1998

- david.blythe@maryland.gov

Secondary Supervisor(s):

- Monique Duwell, Medical Epidem,iologist, Director MDH IDEORB Center for Infectious Disease Surveillance and Outbreak Response, EIS 2017
- David Crum, State Public Health Veterinarian, Director, MDH IDEORB Center for Zoonotic and Vectorborne Diseases

Background: This is a general infectious disease assignment based in the Infectious Disease Epidemiology and Outbreak Response Bureau (IDEORB), the infectious disease program of the Maryland Department of Health (MDH). MDH/IDEORB is responsible for preventing and responding to infectious diseases, including foodborne, waterborne, and vectorborne infections, infections cause by enteric and respiratory bacteria and viruses, vaccine-preventable diseases, tuberculosis, healthcare-associated infections, and emerging infections such as Ebola, Zika, and MERS-CoV infection. MDH/IDEORB also works in concert with other parts of MDH to prevent and respond to Zika virus, HIV, and sexually transmitted infections. Preventing and responding to infectious diseases is accomplished by close collaboration with Maryland local health departments, hospitals and healthcare providers, and a range of other government and community partners.

Current Work: The EISO's projects have included investigation and response to the 2017 Maryland variant influenza outbreak, synthetic cannabinoid-associated coagulopathy, arsenic toxicity, and dialysis-associated Hepatitis C. She conducted an evaluation of the Maryland nontuberculous mycobacteria surveillance system, and analyses of a large dataset to assess outpatient antibiotic prescribing practices in Maryland.

Proposed Initial Projects: We generally encourage the EISO to start with the surveillance project, since that can build a strong foundation for the remainder of the EIS experience and provide opportunities to meet with key public health stakeholders in Maryland; however, given the broad range of activities within MDH/IDEORB, other projects can be arranged based on the EISO's interests. For example, the outpatient antibiotic prescription analysis project could be started immediately. In addition, outbreaks occur frequently, so, participation in a field investigation, if an appropriate one arose early in the fellowship, would also be encouraged.

Proposed Analytic Project:

A variety of potential analytic projects are available to an EISO within MDH/IDEORB. The following list include analytic projects that could incorporate both descriptive and analytic epidemiology. Additional projects could be arranged, depending on the EISO's area(s) of interest. Possible analytic projects include:

- Outpatient antibiotic prescribing practices: prior analyses of a large dataset of outpatient antibiotic prescriptions among Maryland health care providers have been conducted, and there are opportunities to expand on that, including exploring temporal trends, specialty-specific prescribing practices, and comparison to national datasets.
- Antibiotic resistance surveillance data analyses, including, but not limited to Candida auris, carbapenem-resistant Enterobacteriaceae (CRE) and Pseudomonas aeruginosa (CRPA)
- Statewide Prevention and Reduction of C. difficile Collaborative (SPARC): analysis of the effectiveness of this new, innovative collaborative with CDC Prevention Epicenter partners working with Maryland acute care hospitals
- Rabies: data analysis opportunities related to rabies exposure assessment, animal disease, and human post-exposure prophylaxis
- Maryland HIV cluster data analyses : Evaluation of characteristics of HIV infection clusters identified by genetic fingerprinting
- Gastrointestinal illness co-detection analysis project (e.g. C. diff plus other enteric pathogens)
- Enteric bacterial pathogens analyses: project areas include whole genome sequencing, resistance patterns, and geospatial analyses
- Immigrant health analyses: Evaluation of a large existing dataset, including demographic, clinical, and other health outcome variables, for recently arrived humanitarian immigrants

Proposed Field Investigation Project:

MDH/IDEORB receives reports on more than 400 outbreaks per year, so there are numerous opportunities for EISOs to participate in and lead outbreak investigations. Examples of recent such opportunities include hospital-

acquired legionella outbreaks, HCV associated with dialysis facilities, Pseudomonas and Serratia outbreaks in NICUs, avian influenza associated with an Amish community, vibriosis associated with crab imported from Venezuela, and salmonellosis from contaminated Maradol papayas. All of these investigations require conducting interviews and going out into the field to collection additional data. Additionally, the EISO would be encouraged to participate in an international field experience if interested and the opportunity is available. MDH/IDEORB has nearly daily interaction with partners at Maryland's 24 local public health departments and subject matter experts at CDC, as well as with clinicians at academic medical centers and community-based facilities. Additionally, MDH receives Emerging Infections Program funding so works closely with the nine other EIP sites and also collaborates closely with academic CDC Prevention Epicenter partners. For example, MDH is leading an ongoing statewide C. difficile collaborative in partnership ("SPARC"□) with both Maryland Prevention Epicenters (Johns Hopkins Hospital and the University of Maryland Medical Center), and the EISO would be welcome to participate in associated activities, including conducting site visits and infection control gap assessments at participating hospitals. The EISO would also work with MDH/IDEORB's Center for Zoonotic and Vectorborne Diseases to collaborate with veterinarians and other experts in animal health, including at the Maryland Dept. of Agriculture, U.S. Department of Agriculture, and with industrial agriculture partners to prevent and respond to zoonotic infections using a One Health approach. There are also numerous opportunities to collaborate with fellow EISOs (field-based and CDC headquarters-based).

Proposed Surveillance Project:

Within MDH/IDEORB, a wide variety of potential surveillance projects are available to an EISO. The following list includes surveillance projects that primarily involve secondary evaluation of existing Maryland surveillance systems. Other projects could be arranged, depending on the EISO's area(s) of interest. Some surveillance projects would potentially require visits to Maryland local health departments or clinical facilities for collection of additional data or review of surveillance system processes. Possible project surveillance systems include:

- Latent TB Infection (LTBI) Surveillance "" LTBI became a reportable condition in Maryland in 2018, providing an excellent opportunity for an EISO to evaluate a new statewide disease surveillance system that will be important to monitoring and reducing active TB disease
- Acute Flacid Myelitis (AFM) Surveillance "" Evaluation of the Maryland surveillance system for AFM, a rare but serious condition which has been confirmed in multiple Maryland residents
- Hepatitis A Surveillance "" Evaluation of surveillance for Hepatitis A, including both disease occurrence as well as vaccine administration to prevent Hepatitis A outbreaks
- Legionellosis Surveillance "" Evaluation of the Maryland surveillance system for legionellosis, a complex disease with increasing numbers of cases in Maryland, and requiring close collaboration of infectious disease and environmental health stakeholders
- Tickborne Diseases Surveillance "" Evaluation of surveillance systems for multiple tickborne infections currently reportable in Maryland, including RMSF, Babesiosis, Ehrlichiosis, and Anaplasmosis, as well as surveillance systems for emerging tickborne infections, including Powassan Virus, Heartland Virus, and Bourbon Virus.

Current Position Data:

A wide range of existing datasets are available to the EISO for projects, including communicable diseases surveillance, Emerging Infections Program, TickNET, healthcare-associated infections surveillance, Maryland immunization registry, hospital discharge data, and HIV morbidity and behavioral surveillance program data. Other possibilities for datasets (e.g., environmental health, cancer) can be explored based on the EISO's interests.

Position Strengths: High-quality supervision; assignment to visible investigations of public health importance; extensive exposure to real-world state and local health department practice; close collaboration with cutting-edge state public health laboratory; proximity to outstanding medical institutions; diverse population with varied cultural and travel-related health issues; collegial and team-oriented work environment.

Staff & Resources: The EISO is supported by >80 MDH/IDEORB public health professionals plus experienced staff in Maryland's 24 local health departments (LHD). Many former EISOs are affiliated with MDH, including the two most recent EISOs who are working at IDEORB. Other local resources include the faculty and libraries of the

Johns Hopkins University (JHU) School of Public Health and the University of Maryland Baltimore, Maryland's three medical schools, and the Maryland state public health laboratory, which is also one of the seven regional antibiotic resistance network laboratories.
Special Skills Useful for this Position: IDEORB is a busy, fast-paced general communicable disease program. As such, it requires the EISO to be open to working on more than one project in a variety of subject areas at a time and to developing an ability to prioritize activities. Clinical experience and training can be helpful but is not required.
Domestic Travel: 10% **International Travel:** 0%

Field Assignment Description

Size of Community: 6 million
University Affiliation: Maryland Department of Health (MDH) Infectious Disease Epidemiology and Outbreak Response Bureau (IDEORB) maintains active affiliations with Johns Hopkins University and the University of Maryland School of Medicine and trains residents and students from
Living Environment: Moderate climate and a variety of living environments, including urban and suburban areas along the Baltimore-Washington, DC corridor; rural agricultural and fishing areas on the Eastern Shore; and mountainous locales in Western Maryland.
Cultural and Recreational Assets: Attractions include Baltimore's Inner Harbor and the city's many other cultural and historical venues; Washington, DC; easy access to outdoor activities; beaches; mountains; museums; theaters; restaurants; night life; professional sports; and significant
Opportunity for Partners' Employment: Numerous, including private businesses; government; colleges; universities; and healthcare facilities.

DSEPD-EWB-Nevada-2019-01

Primary Supervisor: Cortland Lohff, Residency Program Director

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Secondary Supervisor(s):

- Ying Zhang, Senior Scientist

Background: A member of the Office of Epidemiology and Disease Surveillance (OEDS), the EISO will be situated among our epidemiologists, disease investigators, biostatistician, and informatics scientists. Routine activities will help the EISO develop skills in disease investigation and response and offer the opportunity to participate in and later to lead outbreak investigations. Outbreak and other major investigations or events are routinely performed under the structure of the Incident Command System, which will give the EISO first-hand experience in the operation of emergency preparedness activities. We rely on the EISO to respond to disease-related public and media inquiries and to be in the after-hours call rotation. The EISO will have access to a number of robust databases for potential analysis, including birth and death certificates, hospital discharge and emergency department visit data, coroner's data, as well as BRFSS and YRBS. Clark County accounts for more than 70% of the state's population. Therefore, although SNHD is a local health department, we monitor and can help influence the health status of the entire state.
Current Work: Use of coroner data to create a drug-overdose mortality surveillance system in Clark County, Nevada
Evaluate TB screening program for high risk students within the Clark County School District
Firearm injury surveillance in Clark County, Nevada
Explorative analysis of rapid repeat teen births in Clark County, Nevada
Proposed Initial Projects: - Use SNHD's communicable disease surveillance database to query monthly reportable disease/condition statistics.

- Query CDC WONDER, WISQARS and local data sources to identify trends and assess factors associated with violent crime.
- Analyze hospital discharge and BRFSS data to identify trends and factors related to premature death.
- Design and administer a survey to assess the effectiveness of one or more chronic disease prevention program interventions.
- Use BRFSS data to assess risk factors for multiple chronic conditions.
- Develop a standalone chronic disease annual report card.
- Participate in the quality improvement process of public health accreditation.

Proposed Analytic Project:

The recent declaration that the opioid epidemic is a national emergency highlights the importance of providing resources, education and tools to combat addiction and support recovery efforts. Since 2017, in partnership with the Southern Nevada Harm Reduction Alliance (SNHRA), the SNHD has been implementing a comprehensive needle exchange program, including a delivery component brand new to the United States-syringe vending machine (SVM) services. The goal of this program is to improve the health and well-being of people affected by drug use by increasing their access to health care, providing them with education, and reducing the risk of harm to others in our community.

OEDS staff have been collecting and monitoring the SVM transaction data since the program initiation. The EISO will work with the supervisors and other epidemiologists to design and implement the evaluation of SVM program. The evaluation should answer questions such as: Are there demographic differences among people who prefer to access SVMs vs. a traditional storefront Syringe Services Program? Does use of SVMs decrease the time it takes for an individual to seek drug treatment?

This evaluation can include both qualitative and quantitative components. The quantitative analysis protocols are already in place; and have been used to develop an abstract and the first-year evaluation report. The epidemiologists, disease investigators, and health educators at OEDS will help the EISO with new data collection and analyzing both qualitative and quantitative data.

Proposed Field Investigation Project:

The second release of the Southern Nevada Community Health Assessment Report is expected in Spring 2020. OEDS plays the central role in the assessment activities. The EISO will have opportunities to support all aspects of the assessment, including community outreach, facilitating focus groups, analyzing qualitative and quantitative data, and producing fact sheets. By participating in this project, the EISO will get exposure to survey design, implementation, data cleaning, data analysis, and report writing.

The EISO will also participate in or lead foodborne, waterborne, or airborne outbreak investigations, through which s/he will have plenty of field experience to collect and analyze primary data. Investigations previous EISOs have led include a TB outbreak in a NICU, norovirus outbreaks in multiple restaurants, and HFMD (Hand, Foot, and Mouth Disease) outbreaks in daycares and schools.

We will also support the EISO to participate in Epi-Aids and emergency response deployments.

The SNHD is one of the largest local public health organizations in the United States. SNHD serves more than 2.2 million residents, which represents 72 percent of Nevada's population. While the state capital is more than 400 miles north of SNHD, the Nevada Division of Public and Behavioral Health has several office branches stationed in Clark County, including one of the two state epidemiologists, and the Office of Public Health Informatics and Epidemiology. The geographic proximity facilitates SNHD's close collaboration with the state health department on disease investigations, grant management, and resource sharing.

The SNHD has also been working collaboratively with multiple community partners in their community health assessment and improvement efforts. These partners include, but are not limited to, Clark County School District, Clark County Fire Department, Clark County Social Services, Dignity Health, American Heart Association,

Las Vegas Metropolitan Police Department, the Fusion Center, Las Vegas Chamber of Commerce, March of Dimes, United Way, University Medical Center, Touro University, Roseman University, College of Southern Nevada, and University of Nevada Las Vegas.

These agencies collaborate with the SNHD in grant applications, outbreak investigations, workforce development, and continuing education. All these partners, including the SNHD, participate in the Clark County's Multi-Agency Collaborative (MAC), which played essential roles during the response to the October 1 Shooting.
Proposed Surveillance Project:
SNHD has obtained new data sources that can be used to monitor and quantify the opioid crisis in novel ways. These data sources include the Prescription Drug Monitoring Program, Rocky Mountain Poison Control calls, the trauma registry, EMS run data, and Essence's chief complaint emergency room data. The EISO will have opportunity to choose any one or multiple data sets among these new surveillance systems and evaluate it/them from the perspectives of usefulness, simplicity, flexibility, acceptability, representativeness, timeliness, stability, and sensitivity. The death certificate data and hospital discharge data can be used as gold standards when evaluating the new surveillance systems. The EISO will work closely with both the surveillance and informatics teams in SNHD to implement the evaluation and disseminate the findings.
Current Position Data:
Vital records (birth and death data), hospital discharge (inpatient and ED visit) data, coroner's data, and regional data sets (e.g. BRFSS and YRBS). Locally maintained datasets: acute reportable diseases, including tuberculosis, HIV/AIDS, and STDs; immunization, and program-related data.
Position Strengths: - Exposure to full spectrum of public health services.
- In-house public health laboratory and informatics programs (unique for a local health department).
- Size and uniqueness of community (2.2 million residents and 42 million annual visitors), necessitating robust disease surveillance, outbreak and other event response capabilities, and overall emergency preparedness.
- Opportunity to participate in real and simulated event responses.
Staff & Resources: The EISO will work with experts in epidemiology, biostatistics, emergency preparedness, and informatics. The support team for the EISO currently consists of one medical investigator, two senior epidemiologists, four epidemiologists, four informatics scientists, one biostatistician, and one senior health educator. All team members have advanced degrees (MD, PhD, and MPH) in their specialized areas, and will provide support for the fellow in statistics, informatics, medicine, and scientific writing/editing. We will also offer trainings to the EISO in commonly used software, such as SAS, R, and ArcGIS. Computer, administrative, and secretarial support are provided.
Special Skills Useful for this Position: The EISO will ideally have a broad range of interests and be adaptable to the ever-changing demands of working in a local public health agency. Because many of the experiences and projects will occur simultaneously, multitasking is an important skill. In the community SNHD serves, this is particularly true because of the breadth of the agency's responsibilities, which include the full spectrum of public health programs (communicable diseases, including sexually transmitted diseases, TB, HIV/AIDS, and other reportable diseases/conditions; maternal/child health; chronic disease prevention and health promotion; injury; and environmental health, etc.).
Domestic Travel: 5% **International Travel:** 0%

Field Assignment Description

Size of Community: 2.2 million population; 42 million visitors annually; 8,000 square miles
University Affiliation: University of Nevada (medicine, public health), Touro University (medicine), Roseman University (nursing, pharmacy)
Living Environment: Perfect fall/spring, hot summer, cool winter, lots of sunshine, great air quality! Outdoor activities abound (biking, hiking, rock-climbing in Red Rock, skiing -- yes, we have a ski area with base elevation 8,500 feet). Large centrally located airport o

Cultural and Recreational Assets: Central to four National Parks (Zion, Bryce Canyon, Death Valley, Grand Canyon) and Lake Mead National Recreation Area. Major entertainers perform on The Strip and in smaller venues like the new $470-million Smith Center for the Performing Arts. Other l
Opportunity for Partners' Employment: Tourism/casinos, education, government, healthcare, foreign trade, entrepreneurism.

DSEPD-EWB-New Mexico-2019-01

Primary Supervisor: Michael Landen, State Epidemiologist, EIS 1995

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Secondary Supervisor(s):

- Chad Smelser, Deputy State Epidemiologist, EIS 2002

Background: The New Mexico Department of Health (NMDOH) has a long history of participating in the EIS training program and a commitment to develop future public health professionals. NMDOH is a centralized department of health covering the entire population of the state. There are no local health jurisdictions, eliminating jurisdictional battles that could impede EIS Officers (EISOs) in other states. The Epidemiology and Response Division (ERD) has responsibility for communicable disease surveillance, environmental epidemiology, substance abuse epidemiology, veterinary public health, injury epidemiology, vital records and health statistics, emergency preparedness and emergency medical services. The Division has 180 staff and a budget of $30 million. Chronic disease and maternal child health epidemiology reside in the Public Health Division at NMDOH and EIS projects can be completed in those areas as well. State laboratory support is excellent. ERD also has strong collaborations with the University of New Mexico, including the Cancer Registry and the statewide Office of the Medical Investigator, and New Mexico State University. EISOs in New Mexico are fully integrated into outbreak response and are treated as equal team members during everyday public health functions at the Department.
Current Work: Wound botulism in injection drug users; analysis of methamphetamine drug-overdose deaths in New Mexico; fentanyl-related overdose deaths; risk factors for tularemia in domestic dogs; multi-state outbreak of Salmonella Poona; GAS cluster in long-; term care facility residents; crypto outbreak associated with raw milk; youth suicide risk investigation.
Proposed Initial Projects: Projects include: 1) analysis of pneumonia and influenza mortality in NM to identify characteristics that contribute to NM's high rates, including race/ethnicity, rural populations, and access to care. 2) relationship between socio-economic factors and invasive streptococcus infections; 3) understanding the epidemiology of sepsis in NM as sepsis rates have steadily increased since 2010 and disparities between regions and by race/ethnicity appear to exist; 4) trends in life expectancy by race/ethnicity in New Mexico; 5) analysis of suicide in NM where four counties have very high suicide rates; 6) contribution of benzodiazepines to drug overdose death.

Proposed Analytic Project:
Possible initial analytic projects include: 1) analysis of pneumonia and influenza mortality in New Mexico with a focus on identifying characteristics that contribute to NM's high pneumonia and influenza death rates, including race/ethnicity, rural and urban populations, and access to care. 2) relationship between socio-economic factors and invasive streptococcus infections; 3) understanding the epidemiology of sepsis in NM as sepsis rates have steadily increased since 2010 and disparities between regions and by race/ethnicity appear to exist; 4) trends in life expectancy by race/ethnicity in New Mexico; 5) analysis of suicide in southwest New Mexico where four counties have very high suicide rates; 6) analysis of exposure survey and urine contaminant results (arsenic, cadmium, and mercury) using the CDC-funded Four Corner State Biomonitoring Consortium data to determine potential correlations; 7) contribution of benzodiazepines to drug overdose death. Benzodiazepines are one of the few drugs causing OD deaths in NM that increased in 2016. Each of these proposed projects would progress

from descriptive epidemiology to more complex analyses based on the stated study objectives and under the oversight of state supervisors and CDC staff.

Proposed Field Investigation Project:

Opportunities to collect original data for the fulfillment of the field investigation CAL are abundant in New Mexico. All outbreak investigations (foodborne/waterborne, healthcare associated, school, etc.) are led by staff from the offices where the EISO will be stationed and investigations include primary outbreak data gathering in the affected communities. The EISO has right of first refusal for the lead on all outbreaks. If New Mexico had a current EISO, the EISO would have been sent to the US-Mexico border to work on the migrant health issue and investigate a migrant pediatric influenza death, would have had the chance to establish outreach to hepatitis A cases in homeless and injection-drug user populations (including primary data collection at syringe exchange program sites), participated in a study regarding injection drug use and homelessness in persons with group A strep invasive infections, investigated a pertussis outbreak (>100 cases) in two American Indian communities, which included working with the tribal epidemiology center and hosting a radio show with American Indian translators, and had the chance to investigate chemically contaminated private wells in a community surrounding an US Air Force Base. Another possible study including primary data gathering would include looking at the contribution of benzodiazepines in overdose deaths. This would require the EISO to partner with the NM Office of the Medical Investigator and the NM Bureau of Vital Records and Health Statistics to combine datasets for analysis. EISOs in New Mexico have a rich, wide-ranging experience in field epidemiology and public health activities.

NMDOH regularly interacts with the NM Environment Department, NM Agriculture Department, NM Border Health Office, NM Corrections Department, two Tribal Epidemiology Centers, Johns Hopkins Center for American Indian Health, Indian Health Service, City of Albuquerque Environmental Health, Immigration Control Enforcement (particularly at detention facilities), other state departments of health and numerous other professional associations and coalitions. EISOs in New Mexico are able with appropriate oversight to establish their own relationship and govern collaborations with these partners. Recently the NMDOH Border Infectious Disease Surveillance program collaborated with the United States Customs and Border Projection regarding migrant health issues and for the prevention and control of infectious diseases. The NMDOH communicates often with its colleagues in the Mexican State of Chihuahua, an EISO in New Mexico can experience firsthand international cooperation regarding public health topics.

Proposed Surveillance Project:

A surveillance system evaluation of one of the following: 1) evaluation of electronic laboratory report based general infectious disease surveillance, including outbreak detection among American Indian/Alaskan Native (AIAN); 2) evaluation of the communicable disease surveillance system specifically looking at disease detection among AIAN 3) evaluation of influenza hospitalization surveillance; 4) analysis of the environmental public health tracking system in the state; 5) analysis of non-fatal opioid overdose surveillance; 6) evaluating the sensitivity of New Mexico's birth defect registry; 7) evaluating New Mexico's Violent Death Reporting System. These assessments would require on-site experience (e.g. at laboratories, the Univ. of New Mexico, the Office of the Medical Investigator) to learn how the components of the surveillance function and to gather first-hand data for the evaluation. Following the site visits and data gathering analysis of the surveillance and evaluation data would occur with the supervision of site sponsors and subject matter experts.

Current Position Data:

The Epidemiology and Response Division maintains the following: electronic disease surveillance, the Behavioral Risk Factor Surveillance System (BRFSS) data, Youth Risk and Resiliency (YRRS) data, birth records, death records, hospital discharge data, syndromic surveillance and emergency department data.

Position Strengths: The Epidemiology and Response Division offers a well-rounded experience in field epidemiology and analytic epidemiologic studies. The Department of Health has jurisdiction over all New Mexico residents. NM is an Emerging Infections Program (EIP) state and has a population-based Surveillance Epidemiology and End Results (SEER) cancer registry and a statewide medical examiner. EISOs in New Mexico are able to travel throughout our beautiful and diverse state and may, depending on their desire and opportunities that arise, participate in Epi-aid investigations outside the state, including at international sites.

Staff & Resources: There are highly experienced SAS programmers in the Division. NMDOH employs two statisticians, one has extensive experience with data linkage and merging. Methodological expertise is available in Santa Fe at the Department of Health and through the University of New Mexico College of Population Health (one of two in the US). The NMDOH maintains a digital library for reference searches through the NMDOH intranet as well as an affiliation with the library at the University of New Mexico.
Special Skills Useful for this Position: We are looking for a well-rounded individual capable of working with different peoples from diverse backgrounds who is interested in a variety of epidemiologic study topics and can take advantage of what New Mexico has to offer. Ability to speak Spanish is advantageous, but not required.

Domestic Travel: 10% **International Travel:** 10%

Field Assignment Description

Size of Community: Santa Fe in north, central New Mexico is the state capital and has a population of 84,000. The state's population is over 2 million.
University Affiliation: NMDOH maintains affiliations with the University of New Mexico, its medical school and MPH program, and with New Mexico State University and its affiliated New Mexico Department of Agriculture.

Living Environment: Santa Fe's cost of living is similar to major urban areas. The climate has been described as incomparable with 300 days of sunshine each year and unbelievable sunsets. Santa Fe is New Mexico's fourth largest city. Residents are primarily Hispanic, Anglo a
Cultural and Recreational Assets: Santa Fe is a cosmopolitan city with cultural and outdoor activities including a world-class opera, a nationally acclaimed chamber music festival, art galleries and excellent restaurants. Winter skiing is excellent; rafting, boating, fishing, hiking, camp
Opportunity for Partners' Employment: Santa Fe, Los Alamos and Albuquerque offer several major employers with good employment opportunities. There are opportunities for employment in the health care and social assistance industry, tourism related employment, public education employment

DSEPD-EWB-New York-2019-01

Primary Supervisor: Debra Blog, Director Division of Epidemiology, State Epidemiologist

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Secondary Supervisor(s):

- Emily Lutterloh, Epidemiologist, Director Bureau of Healthcare Associated Infections, EIS 2008
- Alexandra (Andi) Newman, Epidemiologist, State Public Health Veterinarian, EIS 2004

Background: NYSDOH is the public health agency for New York State (population - 19 million). Each of 57 counties and New York City has their own health department. NYSDOH has primary responsibility for the 11 million people who live outside of NYC. The Division of Epidemiology oversees disease control and prevention activities for all communicable diseases, except for STDs and HIV. The Division has successfully housed EIS Officers for several decades. The NYSDOH and the EIS Officer encounter a broad range of diseases, conditions and situations. In 2017 NYS received approximately 228,210 reports of communicable diseases. In addition, our 57 counties range from urban to suburban to rural, adding to the diversity of the experience here. The NYSDOH has initiated a large scale task force to address antimicrobial resistance, an exciting and important area of ongoing activity. NYS is also the first state to require registration and testing of all cooling towers in the state for legionella. In addition, NYSDOH is the lead public health agency for the NY Integrated Food Safety Center of

Excellence, one of only six in the nation, and the Northeast Regional Center for Excellence in Vector Borne Diseases, one of only 5 nationwide.
Current Work: Activities include leading an Epi-Aid on group A strep and Candida infections in people who inject drugs, an investigation of a cluster of blastomycosis, responding to a measles outbreak, investigating transmission of hepatitis C in a private alternative practice, and a possible hantavirus case at a race track.
Proposed Initial Projects: Surveillance evaluation projects could include looking at group A strep community and healthcare surveillance, evaluation of reporting of post-exposure prophylaxis for rabies, or hepatitis C surveillance, among other topics.

NYS is moving to eliminate hepatitis C and there are opportunities to do data analysis projects on hepatitis C. NYS is also the site of the largest number of Candida auris cases and several data analysis projects are possible. There are many opportunities to analyze foodborne illness data. Other data analysis options include school immunization data, refugee health data, legionella data, or other infectious disease topics.

Proposed Analytic Project:

- Look for vaccine coverage disparities by using school immunization survey and other available data, to identify geographic areas or population subgroups in NYS outside of NYC with low coverage for some or all vaccines.

- Examine Vaccines for Children (VFC) and other immunization data, and census data for NYS residents outside of NYC to identify vaccine "deserts", i.e., geographic areas in which VFC-eligible children and uninsured adults have insufficient or no access to healthcare providers participating in VFC or other vaccine programs.

- Assess longitudinal outcomes among pediatric patients with Acute Flaccid Myelitis through enhanced surveillance and secondary data sources.

- Enhanced surveillance and investigation of blastomycosis in the Eastern Upstate NY region, a recently emerging infection, to inform DOH recommendations and outreach. This would involve case finding using lab data, hospital discharge data, and reporting from physicians.

- Analysis of healthcare worker testing practices for tuberculosis in DOH-regulated facilities, to inform updates to state policies.

- Analysis of health care utilization by newly arrived refugees using our Medicaid database, to assess the types of providers who see refuges, referral patterns and reasons for referral. Findings will be used to inform updates to guidelines on pre-arrival medical treatment.

- Reviewing laboratory data for trends and the impact of culture independent diagnostic testing (CIDT) for enteric diseases and assessing how CIDT is used to inform decisions regarding exclusion from sensitive setting (e.g., food handler, day care, etc.).

Proposed Field Investigation Project:

The primary focus of the EIS experience at the NYSDOH is field investigations. These can range from a single case investigation (e.g., suspect botulism) to a large outbreak of gastrointestinal illness associated with a restaurant or a large measles outbreak. EISOs have been able to travel throughout the state and have been able to take the lead on outbreak investigations, many of which last more than 10 days. In addition, there is commonly at least one EPI-Aid occurring in the state per year, and our EISOS have taken the lead on data collection and analysis. Legionella and enteric/foodborne disease investigations include both human and environmental aspects of cases investigations, and there are multiple opportunities available for investigating these diseases and collecting and

analyzing data from these types of investigations. Other opportunities exist for investigations, data collection, and data analyses on vaccine preventable disease, healthcare associated infections, tuberculosis cases, zoonoses, and environmental health problems.
While working with the NYSDOH, the EISO will primarily interact with public health partners, specifically local health departments, through field investigations. However, there are many opportunities to interact with public health partners at other State Agencies, at CDC, and in other states. We have affiliations with academic centers through our Emerging Infections Program and through our Vectorborne and Food Safety Centers of Excellence. We interact regularly with professional medical associations, the legislature, the press, and public health advocates. We are frequently asked to make presentations around the state to local public health agencies, medical professional societies and a variety of other audiences, and the EISO often has opportunities to participate. Also, through our close affiliation with the University of Albany School of Public Health, a number of educational, teaching, and research opportunities exit. The officer will work closely with laboratory staff at Wadsworth Center, the NYS Public Health Laboratory, which is a leader in incorporating whole genome sequencing into communicable disease investigations.

Proposed Surveillance Project:
There are many areas for the potential surveillance evaluation project. These include but are not limited to:

- Rabies post-exposure prophylaxis reporting
- Legionellosis surveillance
- Impact of whole genome sequencing and culture independent diagnostic techniques in bacterial surveillance and outbreak investigation
- Surveillance for anti-microbial resistant organisms, such as carbapenem resistant Enterobacteriaceae and Candida auris.
- Mycotic disease surveillance
- Arboviral disease surveillance

The surveillance project will include review and analyses of our data collection systems and data repositories, primarily through computer-based evaluations. Real life use will be evaluated through site visits, work with local health departments, and field investigations. Interviews with users are also available.

Current Position Data:
NYSDOH is a leader in electronic lab reporting and surveillance systems. As a result, there are robust data on disease surveillance, lab reporting, outbreaks, and more. Responsibility for all communicable disease surveillance systems is centered in the Division of Epidemiology where the EISO will be located.
Position Strengths: NYSDOH is a public health agency with many opportunities for applied epidemiology experience. Staff are supportive, experienced, approachable, and dedicated. The public health laboratory is one of the best in the country and is at the forefront of the development and use of whole genome sequencing and detecting antimicrobial resistance. The Department is one of ten states funded to do enhanced surveillance and special studies through the Emerging Infections Program and one of 6 states funded to maintain a Food Safety Center of Excellence. Should the opportunity to participate in a CDC-sponsored international investigation occur, EISO participation would be supported.
Staff & Resources: The Division has many doctoral-level staff (MD, PhD/DrPH, DVM, 5 EIS alumni) and numerous masters-level staff. The Department has an outstanding public health laboratory, strong computer support, and easily accessible statistical consultation.
Special Skills Useful for this Position: EIS Officers should come with a willingness to work and learn, an interest in communicable disease and applied epidemiology, and ability to take initiative. Interest in working with a

diverse population and geography is important. Ability to work well with a team of professionals is desirable. The ability and flexibility to travel is an important part of field epidemiology
Domestic Travel: 10% **International Travel:** 0%

Field Assignment Description

Size of Community: Population of Albany County is about 259,300 and the cities and surrounding counties approaches one million. New York State has 19 million people, 11 million of whom live outside of New York City.
University Affiliation: The Department has affiliation with the SUNY School of Public Health. Many staff are faculty there. Masters and doctoral students do internships frequently in the Division.
Living Environment: Albany is a moderate-sized urban city with beautiful suburban and rural surroundings. The area boasts strong public and private schools. Albany is the state capital and is the center of state government.

Cultural and Recreational Assets: Albany is large enough to offer significant cultural and entertainment activities, yet small enough to be friendly and easy to live in. There is also an abundance of outdoors activities and the Adirondack and Catskill Mountains are close by. Albany is wit
Opportunity for Partners' Employment: Employers include area hospitals, General Electric, state and local government, universities, and numerous other businesses, including a growing high-tech sector.

DSEPD-EWB-New York-2019-02

Primary Supervisor: Marcelle (Marci) Layton, Assistant Commissioner, EIS 1992

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Secondary Supervisor(s):

- Annie Fine, Medical Director, Reportable Disease, Data, Informatics, and Analysis Unit, EIS 1996
- Sharon Greene, Director, Data Analysis Unit, EIS 2005

Background: BCD is one of four infectious disease programs at NYC DOHMH (others include AIDS, Tuberculosis, and Sexually-Transmitted and Vaccine-Preventable Diseases). BCD's mission is to monitor communicable diseases in NYC so that we can rapidly detect, characterize and respond to infectious disease threats and prevent or control ongoing transmission. Key activities include:
ïƒ˜ Conduct case investigations for over 70 infectious diseases. The range of diseases under our jurisdiction is varied and includes diseases that have always been of public health significance, such as typhoid fever and meningitis, and those of emerging significance to public health, such as Zika virus and Middle East Respiratory Syndrome.
ïƒ˜ Perform routine, systematic analyses of surveillance data to track disease trends and characterize potential exposures and populations at risk to prioritize prevention efforts.
ïƒ˜ Detect, investigate, control, and prevent outbreaks.
ïƒ˜ Provide consultation and educational outreach to medical and animal health providers and the public on the recognition, prevention and control of communicable diseases.
ïƒ˜ Maintain timely and informative syndromic surveillance systems to monitor illness patterns and provide situational awareness during public health emergencies.
ïƒ˜ Conduct special epidemiologic studies.
ïƒ˜ Plan for public health emergencies, such as bioterrorism, pandemic influenza or other highly communicable disease threats.
Current Work: Cluster of suicidal ideation identified by syndromic surveillance.
Foodborne botulism cluster due to home-canned peas.

Outpatient monitoring for persons colonized with _Candida auris_ to assess duration of colonization and use of infection control precautions.
Association between racial discrimination and health-related quality of life and the impact of social relationships.
Proposed Initial Projects: Survey NYC assisted living facilities (ALFs) to assess current practices in food preparation when handling high risk foods (e.g., deli meats) for patients at increased risk for foodborne disease (e.g., listeriosis). Unlike hospitals, ALFs have no regulatory oversight of their food preparation practices. This survey would be based on a similar study conducted in 2008 in hospital settings, by our EIS officer at the time (Cokes C, France AM, Reddy V, et al. Serving High-Risk Foods in a High-Risk Setting: Survey of Hospital Food Service Practices after an Outbreak of Listeriosis in a Hospital. Infect Control Hosp Epidemiol 2011;32(4):380-386.)
Proposed Analytic Project:
Potential projects are varied and can be catered to the subject matter, epidemiologic, and statistical interests of the EIS Officer and do not necessarily need to be based in BCD or focused on infectious diseases. Many projects are possible using existing surveillance, registry or survey data already collected by DOHMH, so that there is assurance of completing the analysis within the two year fellowship. Some potential projects include, but are not limited to:

1) Analyze data for work and daycare exclusions for cryptosporidiosis and giardiasis to inform possible changes to the NYC Health Code. Analyses will focus on the extent to which current exclusion policies, including follow-up stool testing, identify and exclude people with prolonged shedding and evaluate the overall burden of exclusions for patients and the workforce impacts from exclusions on DOHMH.
2) Matching NYC hepatitis C surveillance data with hospitalization data to look at hospital admission, discharge, diagnosis, patient-level characteristics to characterize our patients with chronic hepatitis C;
3) Describe geographic and temporal patterns of emergency department (ED) utilization in NYC in relation to disease prevalence to measure different ED utilization patterns and determine their relationship to neighborhood income and racial/ethnic distributions;
4) Characterize trends in infectious disease mortality in NYC in the pre- vs post-HIV era;
5) Over 5,000 animal bites are reported annually, mostly from dogs and rates are highest among young boys in the poorest NYC neighborhoods. A study would be conducted to understand why, and use the findings to inform dog bite prevention efforts.
Proposed Field Investigation Project:
The potential for outbreak and other field investigations abounds. It is NYC after all! Our Bureau alone investigates >100 outbreaks per year, ranging from small foodborne outbreaks to citywide emergencies, such as our response to imported Zika virus in 2016. Outbreak investigations provide plenty of opportunities to apply practical epidemiologic methods in a variety of field settings, from healthcare to restaurants, jails and shelters, and occasionally to more "exotic" settings such as the backstage of Broadway theatres or cruise ships. We are also very supportive (as well as extremely jealous) of our EIS officers participating in international deployments and often help directly arrange them. Almost all of our EIS Officers who have wanted an international experience have been able to go on at least one trip. Finally, NYC does occasionally request Epi Aids from CDC, and our EIS Officers always have first dibs on participating.

Most acute outbreak investigations in NYC require the core steps of planning the initial response, developing questionnaires and preparing the database for data entry, followed by either telephone-based or field interviews of the persons involved, data analysis and summarizing the findings for both internal and external use. As much as possible, we encourage our EIS Officers to spend some time in the setting where the outbreak occurred (e.g., participating in restaurant inspections as part of a suspected foodborne outbreak response or going to the home of a patient suspected to have foodborne botulism to actively look for potential contaminated food items in their kitchen).

We have strong collaborative relationships with our New York State Department of Health colleagues, as well as our counterparts in the New Jersey and Connecticut health departments, and our neighboring local health departments in NY State. DOHMH also has strong academic partnerships with Columbia and Hunter/CUNY Schools of Public Health, with many graduate students doing internships here for both their thesis work and/or capstone projects as well as the opportunity to leverage their academic staff to support DOHMH projects. We also work extremely well with colleagues in other key city and state agencies, including the NYC Emergency Management agency, NYPD and FDNY, the Departments of Homeless Services and Environmental Protections, and the NYC Health and Hospital Corporation (the city's public health care system) as well as NY State agencies (Agriculture and Markets) and federal agencies (CDC, FDA, USDA and FBI). Acute outbreak investigations often require working with one or more of these partners, including in the field as well as participating in any follow up multi-agency meetings or task forces to prevent future recurrences. Finally, we also often need to work with unique partners based here in NYC, when acute issues occur, including the US office of MÃ©decins Sans FrontiÃ¨res (Doctors Without Borders), the United Nations medical office, and the Wildlife Conservation Society that manages the Central Park and Bronx zoos.

Proposed Surveillance Project:

Similar to epidemiologic projects, the potential areas to focus on for the surveillance evaluation are wide-ranging, and can be catered to the subject matter interests of the EIS Officer and do not necessarily need to be based in BCD or focused on infectious diseases. NYC DOHMH has numerous existing surveillance systems (e.g., infectious disease, lead, poisonings, mental health conditions, opioid use) as well as registry data (birth and death, immunization and hepatitis B and C) to choose from. Some potential surveillance systems for the EIS Officers to evaluate within BCD include, but are not limited to:

1) Evaluating a citywide antibiogram for outpatient urinary tract infections (will include meetings with key infectious disease and microbiology partners in the NYC healthcare system) that is being expanded to include other infections.
2) Evaluating NYC's participation in the US Zika Pregnancy Registry that currently includes over 400 infants who are being followed for up to two years of age (will include field visits with BCD staff conducting medical records reviews on infants with laboratory evidence of Zika infection).
3) Evaluating BCD's current efforts to improve the completeness and accuracy of race and ethnicity data in our surveillance system to better assess inequities in communicable diseases in NYC

Current Position Data:

Surveillance data for >90 diseases that are mandated to be reported by the NYC Health Code. Syndromic surveillance data from emergency department visits, pharmaceutical sales, 911 calls and school nurse visits. Birth and death certificate data. Information on NYC public data sources is available at http://www1.nyc.gov/site/doh/data/tools.page. All data are accessible and readily available for use on the EISO's arrival.

Position Strengths: NYC DOHMH is an exciting work environment and you get a true taste of all aspects of public health at the local level, from field investigations, to addressing the legal and communication challenges that arise, to dealing directly with the communities affected as well as being here to participate in any long-term follow up that is needed. Energetic, knowledgeable colleagues are willing to work with you to ensure projects are completed. DOHMH has a large number of EIS alumni (> 30) who understand what types of projects an EIS officer is looking for, and what the fellowship is all about.

Staff & Resources: DOHMH has a large number of medical/doctoral-level epidemiologists, including >30 EIS alumni. BCD staff provide epidemiologic support and assist in field investigations. Computer, statistical, and clerical support are readily available. The City and State public health laboratories provide diagnostic support.

Special Skills Useful for this Position: Though a medical background (especially infectious diseases) and/or prior epidemiologic, statistical, and computer skills as well as good oral and written communication skills are very helpful, we consider this a training opportunity and will work with the EISO to help improve these skills if s/he has minimal prior experience in public health or infectious diseases. The most important characteristics for an

EISO in NYC are the ability to work well with a very diverse staff, to be able to juggle more than one project at a time and to be able to work under occasional demanding or stressful situations.
Domestic Travel: 0% **International Travel:** 0%

Field Assignment Description

Size of Community: 8.5 million
University Affiliation: We have strong collaborative relationships with Columbia and Hunter/CUNY Schools of Public Health.
Living Environment: Sometimes challenging, often surprising, always exciting.
Cultural and Recreational Assets: If you have to ask"-- .it is NYC after all!!
Opportunity for Partners' Employment: Excellent

DSEPD-EWB-North Carolina-2019-01

Primary Supervisor: Aaron Fleischauer, CDC CEFO, EIS 2002

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Secondary Supervisor(s):

- Zack Moore, State Epidemiologist, EIS 2006
- Jennifer MacFarquhar, CDC CEFO, EIS 2007

Background: The North Carolina Division of Public Health has hosted EIS officers in the area of communicable disease since 1953. The Communicable Disease Branch (CDB) is housed within the Epidemiology Section, which is responsible for reducing morbidity and mortality resulting from communicable, occupational and environmental diseases and conditions. The CDB has over 150 employees and is responsible for conducting surveillance for communicable diseases, including HIV, STDs, and all other communicable diseases reportable under NC law, and for protecting the health of the citizens of North Carolina through prevention and control of those diseases. EIS officers in this position work on a wide range of communicable disease investigations and projects and have frequent opportunities to collaborate with colleagues in other branches and sections of the Division of Public Health. The EIS supervisors and consultants have combined decades of experience with the EIS program and are committed to maximizing educational opportunities for officers and identifying projects that meet their individual needs.
Current Work: Current investigations include legionellosis, Enteroinvasive E. coli, measles, and coagulopathy associated with synthetic cannabinoids. Current projects include a validation study of influenza-associated death reporting and an analysis of legionellosis testing patterns. Recent projects have included analysis of antibiotic prescribing patterns and developing a legionella response toolkit for local health departments.
Proposed Initial Projects: The surveillance evaluation of CRE and C. auris may also extend into a social network analysis of discharge datasets to model patient movements through the healthcare continuum, or a cluster analysis of KPC producing CRE.

The protocol for the sporadic legionella and environmental risk factor project in collaboration with UNC Chapel Hill will available as an initial analytic project.

The EIS officer may research, develop, and implement an extremely drug resistant organism (XDRO) registry of patients colonized with these organisms, thereby promoting rapid response and containment of highly resistant pathogens.
Proposed Analytic Project:
In partnership with the Department of Epidemiology at the UNC Gillings School of Global Public Health, the officer can explore environmental risk factors potentially associated with the statewide increase in sporadic

legionellosis cases. Environmental exposures may include public versus private water, age of housing units, and climate factors. The analysis will likely include space-time prediction modeling as well as multivariable regression.

With the advent of antiviral treatments for hepatitis C, the officer can estimate cure-rates using Medicaid data, and assess effect modifiers such as demographics, insurance status and geographic factors. With these findings we can better target limited screening, referral to care and treatment resources.

The nationwide opioid crisis has resulted in a syndemic of infectious disease outcomes including viral hepatitis, HIV, and bacterial infections including endocarditis. The officer can model the distribution of these infectious outcomes as a syndemic in space and time and evaluate if newly implemented syringe exchange programs in select counties have effected these outcome distributions.

The distributions and trends in latent tuberculosis infection (LTBI) in NC residents are unknown. With active TB disease cases decreasing statewide, TB control programs are increasingly focusing on treatment of LTBI in an effort to decrease TB risk. LTBI is not reportable in NC, but several local health departments track LTBI testing in their counties. We are also exploring adding electronic laboratory reports of IGRA test results in our state disease reporting system (NCEDSS). The EIS officer would produce the first geospatial and trend analysis of LTBI in NC.

Proposed Field Investigation Project:

Each of our EIS officers have averaged greater than five field-based outbreak investigations during their assignments. In addition to outbreak investigations, EIS officers have participated in disaster responses (i.e., hurricanes) and mass gatherings (i.e., Democrat National Convention). For example, in 2020, Charlotte, NC will be hosting the Republican National Convention. As part of our comprehensive healthcare-associated infection program, the EIS officer will also participate in facility assessments following occurrence of sentinel reports or other reports of breaches in infection prevention protocols. The Occupational and Environmental Epidemiology Branch has also supported EIS officer field investigations including lead exposures, chemical spills and contaminating incidents. We strongly support international deployments to support the HHS mission should the opportunities arise.

We work extensively with our 84 Local Health Departments. The EIS officer will train to serve as an on-call epidemiologist to support providers and local health departments. Additionally, the EIS officer will be responsible for monitoring one reportable disease condition (e.g., legionellosis) and will work regularly with local health department communicable disease nurses to ensure patients meet case definition, are investigated and are reported to the state. Travel to assist local health departments is expected.

We also have a strong collaborative partnership with the UNC Department of Epidemiology. The collaboration includes joint projects, research grant opportunities, student mentorships and teaching opportunities. The NC Division of Public Health and CDB also have strong partnerships with other academic partners (e.g. Duke, NC State University, Wake Forest, and East Carolina University) and the EIS officer will have ample opportunities to collaborate with these groups as well as other governmental and non-governmental partners on specific investigations or projects during their assignment.

Proposed Surveillance Project:

An evaluation of carbapenem-resistant Enterobacteriaceae (CRE) and Candida auris reporting in the NC Electronic Disease Surveillance System (NC EDSS): These two conditions became reportable effective October 1, 2018. The surveillance evaluation would focus on data quality and completeness and improve our understanding of the relationship between CRE /C. auris cases and healthcare facility exposure. Understanding the connection between healthcare facilities (i.e., long term care and acute care facilities) with regard to movements of patients with CRE infection or colonization will allow the health department and healthcare facilities to better target interventions to prevent and contain the spread of CRE. This project would involve interviews and site-visits with hospital-based epidemiologists across the state.

Evaluation of surveillance for Salmonella and the impact of culture independent diagnostic testing (CIDT). Salmonellosis is common in North Carolina (>2,000 reported cases/year). Traditionally, the gold standard for Salmonella diagnosis and backbone of surveillance has been the diagnostic culture. However, the use of CIDT is becoming increasingly prevalent. The EIS officer will evaluate Salmonella surveillance data in NC EDSS to describe changes in data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness, and stability with regard to the use of CIDT for the diagnosis and reporting of Salmonellosis. This evaluation may be used to guide recommendations and policy. This project would involve interviews and travel to meet with laboratory directors and local health department staff.

Current Position Data:

Our statewide reportable disease surveillance system, NC EDSS, is a completely integrated and linked system that includes comprehensive data for all 75 communicable diseases including HIV, STDs and tuberculosis. Our statewide syndromic surveillance system, NC DETECT, includes real-time data from all 115 hospital emergency departments in NC (greater than 65 million visits) as well as data from the Carolinas Poison Center. Access is available to other data sources such as the statewide Hospital Discharge Database, State Cancer Registry, Vital Statistics, and the Birth Defects Monitoring System.

Position Strengths: We have a diverse staff committed to mentoring EISOs. Large population and close relationship with local health departments ensures opportunities for working on outbreaks. Close relationships with neighboring academic institutions and other partners provide opportunities for collaboration, practice, and teaching.

Staff & Resources: Experienced staff including physicians, veterinarians, nurses, doctoral-level epidemiologists, entomologists, and industrial hygienists; expertise in surveillance, outbreak investigation, and study design. Consultation with biostatisticians available through the State Center for Health Statistics and UNC School of Public Health.

Special Skills Useful for this Position: Flexibility; strong interpersonal skills; ability to communicate clearly with the public, lay audiences, and professionals from a variety of backgrounds and disciplines; willingness to travel within the state.

Domestic Travel: 10% **International Travel:** 0%

Field Assignment Description

Size of Community: >415,000 (Raleigh); >1.7 million (Research Triangle); 10 million (State; 9th largest)

University Affiliation: The Research Triangle is rich in academic health resources, including the UNC Gillings School of Global Public Health, UNC and Duke Schools of Medicine, and NCSU College of Veterinary Medicine.

Living Environment: Raleigh is a vibrant city. Housing is affordable and public schools are excellent.

Cultural and Recreational Assets: The Research Triangle area (including Raleigh, Durham, and Chapel Hill) offers many cultural and sporting events and excellent restaurants. Several state parks and lakes are nearby. Raleigh is less than three hours from the Blue Ridge Mountains and the oc

Opportunity for Partners' Employment: The Research Triangle area offers abundant opportunities for employment and education, including academic, medical, biomedical, research, technology, and pharmaceutical institutions.

DSEPD-EWB-Tennessee-2019-01

Primary Supervisor: Tim Jones, State Epidemiologist, EIS 1997

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Secondary Supervisor(s):

- John Dunn, Deputy State Epidemiologist, EIS 2003

- William Schaffner, Professor, Vanderbilt University School of Medicine, EIS 1966

Background: The Department of Health serves a demographically diverse population of over 6 million. The EISO works in the Communicable and Environmental Disease Services and Emergency Preparedness Division, which includes programs in immunizations, TB, healthcare associated infections, HIV/STD/Hepatitis, environmental health, foodborne and zoonotic diseases, emergency preparedness, and outbreak investigations. All of these programs are overseen by the officer's primary supervisor. The EISO in Tennessee has the opportunity to work within all program areas with a diversity of assignments. Our goal is surveillance and control of communicable diseases, supporting state and national priorities. We have exceptionally good relationships with our regional and county health departments, and with Vanderbilt University Medical Center, with lots of opportunities for field experience.

Current Work: Current officer projects include: multipathogen enteric diseases at a zipline park, foodborne outbreaks, hepatitis A in vaccinated persons with HIV, invasive Candida in persons who inject drugs, neonatal abstinence syndrome surveillance, epidemiology of invasive pneumococcus, psittacosis at a poultry farm, opioid overdose cluster, healthcare associated hepatitis A, and many others.

Proposed Initial Projects: Depending on the EISO's interests, we anticipate beginning the surveillance system evaluation upon arrival. There are several opportunities and we anticipate that the EISO would have substantial input in selection of both the surveillance evaluation and a larger analytical project. We also strongly consider the EISO skill set and partner the officer with compatible staff to accommodate clinical versus analytical experience. Ideally the EISO will work on an acute disease outbreak or public health response with an applied epidemiology component shortly after arrival. We will prioritize for these opportunities for the Officer as they arise.

Proposed Analytic Project:

Multiple opportunities exist for analytic projects. Examples include:

- Invasive pneumococcal disease: Data are available from our CDC Emerging Infections Program (EIP) ABCs study, for spatiotemporal and socioeconomic analyses; these could potentially include use of mapping software, multivariate analyses, and other advanced analytic methods (with ample technical support at TDH and Vanderbilt).
- Spatiotemporal analysis of Shigella infections; Shigellosis causes community outbreaks in a cyclical pattern every 5-6 years in Tennessee. The EISO will analyze 20 years of shigellosis data using GIS and spatio-temporal analyses (eg, SatScan) to identify statistically significant sporadic disease clusters at various temporal and spatial intervals. NORS outbreak data will be analyzed to describe person-to-person outbreaks in comparison to sporadic cases. A predictive modeling approach will assess feasibility of outbreak prediction given various sporadic case cluster parameters.
- Analysis of the relative value of different screening and investigation policies on the identification of new cases of sexually-transmitted infections in the community; geographic differences and changes over time in these policies would be analyzed, using existing data, to inform future policy development.
- Analysis of the effect of changing from Pulsed Field Gel Electrophoresis to Whole Genome Sequencing molecular subtyping on the detection of foodborne disease outbreaks; preliminary data are available from our CDC FoodNet and OutbreakNet programs, and increasing rapidly with continued advances in laboratory and informatics technology. Analyses will include assessing thresholds for defining clusters and outbreaks, and correlation with successfully completing investigations.

Proposed Field Investigation Project:

We strongly encourage our EISO to participate in a variety of field investigations during their time here. Because our division covers many different programs (including general communicable diseases, HAIs, HIV/STD/Hepatitis, immunizations, TB, foodborne, vectorborne and zoonotic diseases, environmental epi and emergency preparedness), multiple opportunities typically occur during an officer's tenure. Care is taken to ensure that the

extent of an officer's participation contributes valuably to their education and interests. We encourage participation at all stages of investigation, and taking a leadership role in investigations and field projects. We also support officers in participating in national Epi-Aids and international opportunities if they desire. Past field investigations have included selenium poisoning due to a misformulated vitamin supplement, tuberculosis transmitted from elephants to people, fungal meningitis following contaminated epidural injections, vitamin K deficiency in neonates, invasive candidemia following IV drug use, waterborne salmonellosis following visits to a recreational splash pad, multi-pathogen enteric disease associated with a zip-line facility, and numerous others. Our officer will collaborate with health department colleagues statewide, at all levels. Tennessee is a "mixed model state"□ (with strong programs both at the state and regional levels, as well as health departments in each of our 95 counties). We have exceptionally good working relationships and sharing of responsibilities at all of these levels. Additionally, depending on the type of investigation, the EISO will collaborate with other state and federal agencies. Past officers have worked in leadership roles with partners such as our Healthcare Licensure division, Controlled Substances Monitoring Program, Medical Examiner, Department of Agriculture, FDA, USDA, state and federal environmental agencies, and state and federal wildlife agencies. The EISO will have opportunities to partner with staff in the development and delivery of epidemiology training for statewide staff. As part of our Integrated Food Safety Center of Excellence program, the EISO will have opportunities to collaborate with other states in our region to deliver outbreak training. We also have opportunities to work with the media, and participate in the state legislative process. With close relationships with nearby universities (e.g. Vanderbilt University), there are opportunities to attend conferences, speak, and work on collaborative studies with academic partners. Of note, because our officers frequently work on a variety of projects, they get to interact with multiple people and programs at CDC, across subject areas, during their tenure here.

Proposed Surveillance Project:
Surveillance projects could include (at the discretion of the officer):

- Evaluation of a new surveillance system for chronic and acute hepatitis C; This multifaceted laboratory-based surveillance system began about three years ago, and has many thousands of records, which require various levels of follow up by the health department. No analysis has been done of its quality or value, and it is very resource intensive.
- Evaluation of the effects of including results from Culture Independent Diagnostic Testing (CIDT) in enteric pathogen surveillance; Data are available from several years of FoodNet surveillance as the use of CIDTs has increased, and there are many questions to be answered about how new laboratory technologies will impact traditional surveillance systems.
- Evaluation of a newly implemented surveillance system for legionellosis; This has recently been a high priority for CDC, but is being implemented very differently in different states. TN has launched a relatively intensive system, but there remain many questions about how useful and practical it will be.

Other options are available as well. All of the evaluations will include working with central office staff, as well as gathering information from the field (e.g. local/regional health departments) and other stakeholders.

Current Position Data:
In addition to the programs noted above, TN participates in numerous special programs including the Emerging Infections Program, Foodborne Diseases Centers of Excellence, hospital-associated infections and hepatitis C studies. We also have ready access to vital records, hospital discharge, drug prescription, chronic disease, and other large databases. All of the programs noted in previous sections are under the EISO's primary supervisor.
Position Strengths: The officer's professional development is our primary goal, with scheduled weekly supervisor meetings being a high priority. Supervisors work within the same office and interact daily with the EISO. The officer will gain an excellent working knowledge of practical epidemiology, public health practice, and

applied analytic methods. Publication and national presentations are strongly encouraged. CEDEP staff are friendly, supportive, enthusiastic, and just really nice people to work with.
Staff & Resources: Supervisors make a point of being accessible at any time. Seven EIS alumni and >200 professional staff in our section provide ample support. Statistical, clinical, programming, and epidemiology support is readily available. Close relationships with Vanderbilt University allow access to an array of academic resources.

Special Skills Useful for this Position: Exceptional enthusiasm! Tennessee has hosted fellows of various backgrounds including physicians, veterinarians, DrPHs, PhDs and nursing-related fields. The position is well-suited to allow the fellow to grow and expand in areas that complement their existing knowledge and skills with the goal of making them a well-rounded public health practitioner in applied epidemiology. Staff within the department are accessible to provide subject matter expertise and technical support in training fellows.
Domestic Travel: 10% **International Travel:** 0%

Field Assignment Description

Size of Community: Nashville ~690,000, State ~ 6.7 million
University Affiliation: Exceptionally close relationship with Vanderbilt University (with a dozen others in the area), with access to conferences and libraries, and many opportunities to speak at conferences.
Living Environment: Nashville is the current "hot city"□. The area's quality of life goes beyond its mild climate, growing food scene, and friendly neighborhoods. It is a good place for families; the cost of living is reasonable. Ample social opportunities are available, an
Cultural and Recreational Assets: A thriving arts scene includes live music of all kinds, ballet, theatre, symphony orchestra, and museum of art. We have professional sports teams (NFL, soccer, NHL), and easy access to a wide range of outdoor activities including hiking, biking, and boati
Opportunity for Partners' Employment: Tons. The healthcare industry, academic institutions and entertainment industries are large, but given growth in the area there are innumerable other opportunities as well.

DSEPD-EWB-Washington-2019-01

Primary Supervisor: Meagan Kay, Medical Epidemiologist & Deputy Chief of the Communicable Disease Epidemiology & Immunization Section, EIS 2009

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Secondary Supervisor(s):

- Jeffrey Duchin, Health Officer and Chief of the Communicable Disease Epidemiology & Immunization Section, EIS 1992
- Vance Kawakami, Zoonotic and Emerging Infections Subject Matter Expert (Lead), EIS 2015

Background: The Communicable Disease Epidemiology and Immunization Section (CD-Imms) provides critical population health functions that are not available elsewhere in the community, including:
Monitoring, investigating, and controlling the spread of over 65 notifiable conditions.

Conducting clinical immunization practice quality assurance visits and assessment and education visits with healthcare providers enrolled in the Vaccines for Children (VFC) program

Promoting immunizations to increase rates in King County using evidence based strategies.

Monitoring and responding to biological emergencies and non-communicable disease-related acute population health conditions that require investigation and coordination of healthcare system responses (e.g., carbon monoxide poisoning, illness after natural disaster, biological terrorism) and public communication, in partnership with the Public Health's Preparedness Section.

Working with local healthcare providers, hospitals, laboratories, long term care facilities, schools and universities, businesses, food establishments, child care programs, and community based organizations, as well as state and federal partners, to control the spread of communicable diseases through immunizations, infection control measures, preventive treatments, and education and outreach to the public and healthcare providers.

Current Work: Prevalence of Vibrio vulnificus in retail tilapia; investigation of group A Streptococcus infections at a local hospital; analysis of predictors of hepatitis C virus treatment completion; evaluation of Medical Examiner's near real-time surveillance of fatal drug overdoses; analysis of risk factors for toxic anterior segment syndrome (Epi-Aid) after eye surgery.

Proposed Initial Projects: The surveillance system evaluation is typically one of the first projects that the EISO works on given the deadline from CDC. The EISO can also expect to immediately participate in case investigations with field site visits and public health experiences with partners inside/outside PHSKC. Several of the analytical projects listed above are also available to start right away.

Proposed Analytic Project:
Logistic regression to examine factors associated with having persistent asthma in 2017 among patients in SHA/KCHA for at least 11 months and logistic regression to examine housing type factors associated with having unmanaged asthma.

Analysis of long term outcomes of HIV-infected individuals co-infected with hepatitis B and hepatitis C including (A) assemble data from several disparate sources, conduct data cleaning and data base matching; (B) conduct analyses, determine and code predicting variables and outcome variables (including death attributed to hepatitis, other and unknown deaths, and sustained viral remission).

Estimation of age-specific mortality rates and characterization of the most common causes of mortality among people experiencing homelessness in King County. The project will require a linkage between two data systems: Homeless Management Information System (http://kingcounty.hmis.cc/about-king-county-hmis/) and Vital Statistics data.

Validation of a web-based questionnaire to obtain risk factor and exposure information for patients with salmonellosis. The project will involve an assessment of the reliability and completeness of web-based survey data as compared to the traditional phone interviews and will identify patient-level factors associated with completeness of the web-based survey.

Analysis of healthcare provider factors associated with receipt of recommended services for prevention of unintended pregnancy (long-acting reversible contraception) among women of reproductive age (age 13-44) in King County and assessment for confounding/effect modification by SES, age, and other demographic factors using WA-APCD data.

Proposed Field Investigation Project:
The EISO will have numerous opportunities to participate in field investigations such as foodborne illness/enteric disease outbreak investigations, healthcare associated infections/drug diversion events, zoonotic disease and vaccine preventable disease investigations. Work will include: leading survey development and administration; interviewing patients; medical record review; data analysis; drafting and revising health advisories for the public and healthcare providers; development of public health blog articles in collaboration with experts from our Communications team; drafting manuscripts for submission to peer-reviewed journals.

Public Health -- Seattle & King County has well-established relationships with local healthcare facilities (HCFs) and is notified when HCFs have concerns about spread of infectious diseases within their facility or if a community outbreak is suspected. EISOs have the opportunity to lead or collaborate on these investigations with the HCFs. We are also an academic health department that has an MOU signed with University of Washington (UW). The EISO will have the opportunity to conduct investigations or studies in collaboration with faculty in the UW Division of Infectious Diseases and participate/teach in trainings/courses as well as mentor UW students who complete practicums at PHSKC, if interested. The EISO can also participate in mentoring veterinary students from Washington State University during summer externships with our Department. The EISO will have the opportunity to build relationships with WA DOH partners through participation in site visits to the WA Public Health Laboratory, collaboration on local and state-wide projects (e.g. cancer cluster investigations) and occasional field work (e.g. tick dragging, ZD investigations, etc). Participation on inter-disciplinary working groups (e.g. overdose surveillance working group) is also possible.

Proposed Surveillance Project:
Analysis of a traditional enteric disease surveillance system such as hepatitis A, E. coli, Shigella. This evaluation would involve a review of how data on these infections are collected from laboratories, healthcare providers, Washington Department of Health or other local health jurisdiction partners and how the data are managed and analyzed internally at our health department to identify gaps, inefficiencies, and other opportunities for improvement.

The EISO could also evaluate a nontraditional surveillance system to identify nonfatal overdoses in King County. This project could also involve a field assessment with Emergency Medical Service partners to observe how data is collected in the field and fed into the surveillance system.

Both of these evaluations would primarily involve secondary or desk-based evaluation of data in County databases accessible to the EISO. The EISO would have the opportunity to interview subject matter experts involved in the routine surveillance for these diseases to understand the workflows of the current system.

Current Position Data:
King County and Washington State notifiable conditions databases; immunization registry data, syndromic surveillance database, CHARS, and Medicaid data. housing data. These data are accessible to the EISO and readily available within the first month of the officer's assignment.

Position Strengths: Strong mentorship with all supervisors having completed the EIS fellowship and a successful history of training numerous EIS officers and other CDC trainees (HSIP scholar, PMR trainees, CSTE fellows); supervisor support for training opportunities/professional development, supervisor advocacy for participation in

investigations of interest, subject matter expertise on site, close collaboration with state and federal partners, emphasis on research/publications; broad range of project topics, both infectious and non-infectious, and flexibility regarding project choices depending on officer's interests; numerous frontline investigative experience with right of first refusal; exciting location; fun and collaborative work environment.
Staff & Resources: Section staff includes epidemiologists several of whom have advanced statistical/analytical skills, communicable disease subject matter experts (nurses and a veterinarian) who have experience with disease investigation and control, epidemiology, and risk communication; public health nurse investigators and disease investigators; program managers, a medical epidemiologist (also a veterinarian); health educators; administrative staff; and a Section Chief (infectious disease medical doctor). We also work closely with the Department's Public Health Veterinarian, the Communications team, and the Preparedness section. The EIS officer would have a laptop Windows personal computer with internet access, office applications, and statistical software.

Special Skills Useful for this Position: Database/analytical skills are useful; clinical experience with medical chart review is also helpful.

Domestic Travel: 10% **International Travel:** 0%

Field Assignment Description

Size of Community: King County is home to 2 million residents and is the 13th largest county in the United States. King County includes the ethnically-diverse city of Seattle and small rural communities.
University Affiliation:
University of Washington Schools of Medicine and Public Health

Living Environment: Seattle is well known for its vibrant and scenic neighborhoods. The office is well-connected by public transportation; officers could live in a variety of neighborhoods and housing types (e.g. apartment, townhouse, single-family home) and still have a rea
Cultural and Recreational Assets: The Puget Sound region offers access to natural beauty, recreational activities, a vibrant art, music, and cinema scene, robust coffee and micro-brew and cycling culture.

Opportunity for Partners' Employment: As a large metropolitan area well known for industries including technology, aerospace, and health, the Seattle area has a breadth of employers (Gates Foundation, PATH, Amazon, Microsoft, etc) representing a variety of professions and multiple academic industries

DSEPD-EWB-Washington, DC-2019-01

Primary Supervisor: John Davies-Cole, State Epidemiologist

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Secondary Supervisor(s):

- Preetha Iyengar, Supervisory Epidemiologist, EIS 2012
- Sasha McGee, Senior Infectious Disease Epidemiologist, EIS 2013

Background: This position is within the Research Evaluation and Measurement Division (REM) of the Center for Policy, Planning, and Evaluation at the District of Columbia Department of Health (DC Health). Within REM, the EISO will be part of the Division of Epidemiology - Disease Surveillance and Investigation (DE-DSI), which is responsible for the surveillance, investigation and control of notifiable diseases within the District, with the exception of sexually transmitted illnesses, hepatitis B and C, HIV/AIDS, and tuberculosis. DE-DSI collects, analyzes, interprets, and disseminates data, and provides expertise on infection control practices and disease management. REM also houses the Behavioral Risk Factor Surveillance System (BRFSS), which collects data on chronic diseases, health risks, and health behaviors. EISOs provide a significant service to the District of Columbia Department of Health (DC Health) given that we are tasked with carrying out the responsibilities of both a state and local health department for the nearly 700,000 residents of DC. Additionally, DC Health provides support to address public health issues involving domestic and international tourists, regional commuters, and events of national importance which occur in our jurisdiction. This position provides unique opportunities to use applied epidemiology to address issues of public health importance in diverse populations.
Current Work: Development of a Zika testing and disease case report form using REDCap; Analysis of the ACA young adult dependent coverage expansion on health care coverage and preventive healthcare service utilization; Analysis of leave use and health care utilization among DC Health workers; Estimation of prevalence of STI and enteric co-infections.
Proposed Initial Projects: The officer can begin work immediately on either of the two proposed surveillance system evaluations and analytic projects, with data already available for analysis. Field investigations can be joined as outbreaks or other urgent public health responses are necessary, which will likely include enteric disease outbreak or HAI MDRO containment investigations.
Proposed Analytic Project:
DC EISOs have the opportunity to select analytic projects based on their specific interests. Examples of available projects that could be completed by the EISO include:
- Conducting an analytic study using enteric or Legionnaires' disease surveillance data to model the incidence as a function of various risk factors, to identify geographical clustering, or detect temporal trends. The EISO can use software such as ARC-GIS and SaTScan to analyze spatial, temporal and space-time data in addition to traditional statistical software packages.
- Conducting a retrospective analysis on data from the National Healthcare Safety Network (NHSN) and developing models to identify and describe outbreaks that have occurred at DC healthcare facilities over the past 5 - 10 years. The complete picture of HAI outbreaks occurring in DC is currently unknown due to a lack of reliable real-time HAI outbreak reporting from healthcare facilities. NHSN is a federally hosted database that tracks HAIs at acute and non-acute care healthcare facilities. Findings could be used to validate HAI outbreak reporting and to set up a real-time outbreak reporting and surveillance system for DC Health.

Protocols will be developed and data are available for the analytic projects described, so they will be ready to start upon the EISO's arrival. A statistician and epidemiologist with statistical backgrounds are available to support the EISO. The EISO is welcome to pursue a project involving data that are not housed within CPPE, however there may be a delay in accessing the data depending on the source.
Proposed Field Investigation Project:
Typically, the REM team will lead 3-5 foodborne, 1-2 vaccine preventable diseases, 1 Legionella, 1 zoonotic disease, and 3 HAI outbreak investigations, along with 5-10 multi-drug resistant organisms (MDRO) containment investigations during any given year, including domestic and internationally acquired diseases. The EISO has the opportunity to lead and play an active role in any outbreak or containment investigation being conducted by our team. In 2017 the EISO provided support in investigating a mumps outbreak in multiple universities in DC. DC Health also called an EpiAid in 2017 to support a Legionella outbreak investigation in a senior low-income housing building, led by the EISO. In previous years the EISO has also led investigations for foodborne/enteric disease outbreaks including salmonella and norovirus. Additional examples of field investigations conducted by our team include containment investigations for Candida auris and other MDROs identified in DC healthcare facilities, surveillance for National Special Security Events (NSSEs) such as the presidential inauguration, and surveillance for emerging infectious diseases such as Zika. Outbreak investigations include developing a plan for

surveillance or contact tracing, obtaining contact information or sending communications to all potentially exposed persons, conducting interviews with case-patient contacts to assess risk, communicating educational and prevention information, collecting and analyzing line list data, and providing expert guidance to healthcare facility, daycare, or other staff as appropriate for the setting in which the exposure took place. Previous EISOs have fulfilled CAL1 by responding to local outbreaks, leading Epi-Aids in DC, and volunteering for Epi-Aids to other states.

The EISO will have the opportunity to conduct disease investigations, which involve working closely with intra-agency partners including Food Safety, the DC Public Health Laboratory (PHL), Animal Services, and regulatory partners. Externally, they will interact closely with infection control and laboratory staff at DC healthcare facilities as part of their involvement in surveillance, outbreak, and containment investigation activities. Our team works closely with school nurses on routine surveillance and outbreak investigations, such as norovirus or vaccine preventable diseases. DC EISOs have been invited to be guest lecturers at the George Washington University School of Public Health and Health Services for an infectious disease epidemiology class. We often work with NGOs and global public health agencies to conduct surveillance and education. We also work with DC government agencies, such as the DC Housing Authority, or professional groups such as the DC Hospital Association to conduct investigations and mitigate public health issues when necessary. For routine work, such as developing guidelines to guide public health improvements in DC or protocols to address public health concerns, our team leads and participates in several collaborative multi-agency groups with partners ranging from DC hospitals and long-term care centers (healthcare-associated infections) to the Metropolitan Police Department (opioids). In addition, because of the large population of persons who commute between DC, Maryland, and Virginia, the EISO will have the opportunity to interface closely with our regional public health partners to work collaboratively on investigations, to develop and distribute communications, and exchange data (e.g. case and laboratory reports).

Proposed Surveillance Project:

The EISO will have the opportunity to evaluate DC's local implementation of either the Behavioral Risk Factor Surveillance System (BRFSS) or the Centers for Disease Control and Prevention's National Healthcare Safety Network (NHSN). BRFSS collects data regarding health-related risk behaviors, chronic health conditions, and use of preventive services by DC residents. As part of their evaluation, the EISO will review in depth the process by which data are collected and compare BRFSS results to those from other sources that collect similar information (e.g. hospital discharge or cancer registry data) to assess the system's sensitivity.

NHSN is a healthcare-associated infection (HAI) tracking system that many DC healthcare facilities are required to submit data to in order to comply with District and Federal public reporting mandates. The DC Health HAI Program monitors HAI infection rates, uses the data to promote interventions to prevent infections, provides support and technical assistance to healthcare facilities during outbreaks, and collaborates with partners to develop and implement prevention activities to drive quality improvement. Healthcare facilities that report data are required to follow NHSN methods and surveillance definitions and criteria. Given the limited capacity of facilities to conduct detailed data quality checks, the EISO evaluation can assist in this effort. This would include conducting analyses of NHSN data entered by facilities to assess data accuracy, identifying and understanding systematic weaknesses in facility-specific reporting, and developing recommendations to improve the system. An evaluation of this system may involve field work such as site visits to DC healthcare facilities.

Current Position Data:

Data sets available within CPPE include BRFSS data, hospital discharge data, vital records data (e.g., birth and death records), birth defects surveillance data, syndromic surveillance data (from a system known as Electronic Surveillance System for the Early Notification of Community-Based Epidemics [ESSENCE]), HAI data in NHSN, MDRO data from the Antibiotic Resistance Laboratory Network, and surveillance data for enteric, vaccine-preventable, and vector-borne diseases that are captured in the National Electronic Disease Surveillance System base system (NBS). Other data sets available within DC Health include cancer registry data, surveillance data for HIV, sexually transmitted infections, and tuberculosis, and an immunization registry.

Position Strengths: DC Health functions as a state and local health department, which provides opportunities to not only drive policy development, but support local implementation. This general position is suited to persons

who enjoy learning and being involved in projects in diverse areas. The EISO will have opportunities to collaborate with staff within any of the six DC Health administrations and can choose projects based on their interests. They have the unique opportunity to develop skills in traditional epidemiologic surveillance and outbreak investigation, data analysis, and research through special projects (e.g., surveying persons monitored for Ebola, surveying DC providers' knowledge of rabies).
Staff & Resources: The EISO will work with an experienced and supportive team of epidemiologists and program staff who have supervised or provided support to present and past EISOs and CSTE fellows, including two previous EISOs. The EISO will work most closely with a team of disease investigators and epidemiologists that focus on vaccine-preventable diseases, influenza, foodborne and enteric diseases, healthcare-associated infections, vector-borne diseases, injury and violence surveillance, and opioid surveillance. A variety of software is available for the EISO's use including SAS, Stata and SPSS. Opportunities for training in geographic information system software are also available.
Special Skills Useful for this Position: DC Health provides a diverse experience in multiple areas; the ability to be flexible, work independently as well as part of a team, and work on a wide range of topics will be highly valued in this position. The EISO should be self-motivated and able to manage their time well to accomplish tasks in a fast-paced environment. This position will strengthen the EISO's oral and written communication and critical thinking skills. Support for developing epidemiologic investigation and statistical analysis skills is readily available from the REM team.

Domestic Travel: 5% **International Travel:** 0%

Field Assignment Description

Size of Community: Washington, D.C. has an estimated population of 703,608 in 2018, which makes it the 22nd most populous city in the U.S. Commuters from the surrounding Maryland and Virginia suburbs and tourists raise the city's daytime population to more than one million.
University Affiliation: The District of Columbia Department of Health (DC Health) has special relationships with Howard, Georgetown, and George Washington Universities.
Living Environment: The Washington Metropolitan Area is a diverse, metropolitan area composed of Washington, D.C., Maryland, and northern Virginia. DC has been experiencing marked population growth in the past few years and there is also considerable development taking place
Cultural and Recreational Assets: Washington, D.C. has numerous attractions including the National Mall and monuments, Smithsonian Museums, National Zoo, historic neighborhoods, numerous embassies, and a wide range of restaurants serving foods from around the world. It is also a short dri
Opportunity for Partners' Employment: There are numerous Federal agencies in DC and in the surrounding metropolitan area, including HHS, HRSA, CMS, SAMHSA, NIH, and FDA, as well as non-profit organizations, non-governmental organizations, universities, and consulting and contracting companies

DSEPD-EWB-Wisconsin-2019-01

Primary Supervisor: Jon Meiman, Chief Medical Officer and State Occ. & Env. Disease Epidemiologist, EIS 2013

- Jonathan.Meiman@wi.gov

Secondary Supervisor(s):

- Carrie Tomasallo, Chief, Environmental Epidemiology & Surveillance Section
- Traci DeSalvo, Chief, Communicable Diseases Epidemiology Section

Background: The Bureau of Environmental and Occupational Health (BEOH) is located in the Wisconsin Division of Public Health (DPH) in Madison, WI. BEOH seeks to protect and advance the health of Wisconsin's citizens by investigating emerging threats and developing evidence-based approaches to reduce and prevent

environmental and occupational disease. BEOH is responsible for a wide range of topics, including asthma, childhood and adult lead poisoning, health impacts of climate change, asbestos, work-related injury and illness, radon, chemical spills, and radiation protection. We collaborate with the Department of Natural Resources on issues related to groundwater quality and environmental contamination. BEOH partners with local public health agencies to address community concerns related to chemical spills, cancer cluster investigations, and field investigations of environmental exposures and diseases. BEOH is the state leader in providing expert consultation to local health departments and medical professionals. We work closely with the Bureau of Communicable Diseases (BCD) on cross-cutting issues such as harmful algal blooms and waterborne outbreaks. Approximately 20% of EISO time will be with BCD; this position offers opportunities to investigate infectious disease outbreaks and emerging diseases in BCD, including foodborne, waterborne, zoonotic, and vectorborne diseases.

Current Work: (1) coagulopathy outbreak investigation caused by brodifacoum rodenticide poisoning in smoked synthetic cannabinoids; (2) occupational opioid exposures in 1st responders; (3) carbon monoxide outbreak in food manufacturing facility; (4) Epi-Aid to investigate WV hepatitis A outbreak; (5) trends in poisoning suicide attempts in adolescents; (6) post-Hurricane Maria Surveillance, Puerto Rico.

Proposed Initial Projects: Within the first month, the EISO will begin the evaluation of the CO surveillance system. The evaluation will provide the officer with an opportunity to understand electronic laboratory reporting, hospital discharge databases of emergency department visits and inpatient admissions, local case investigation procedures, and statistical analysis of surveillance data. In addition to BEOH analytic projects, BCD possible initial projects include: 1) characterization of clinical isolates and descriptive epidemiologic features of H. influenzae invasive disease, including subset analysis of H. influenzae type b disease; 2) examination of epidemiologic features and trends of Group B Streptococcal invasive disease.

Proposed Analytic Project:

The EISO may choose from a variety of analytic projects that will build experience analyzing large datasets. Potential projects include:

(1) Risk factors for poor asthma control: The EISO will conduct a weighted survey analysis of the Behavioral Risk Factor Surveillance System, Asthma Call-back Survey data. Descriptive statistics and multivariate generalized linear regression models will be used to estimate adjusted prevalence ratios for risk factors associated with poor control and asthma severity.

(2) Water and elevated blood lead levels (eBLLs): Madison replaced all residential lead service lines (LSLs) in 2011, serving as a natural experiment to assess the risk of lead exposure from water and the effectiveness of LSL replacement. A time-series analysis of eBLLs in Madison before and after LSL replacement will be conducted and compared with communities without LSL replacement. Data include BLLs for Wisconsin children, records of environmental investigations, and addresses of homes with LSLs.

(3) Analysis of workers' compensation (WC) claims: WC claims are a useful but underused data source that can be utilized to identify high risk industries and occupations. The EISO will analyze a WC dataset to produce descriptive statistics and conduct multivariate analyses to identify risk factors for work-related injury in Wisconsin.

(4) Analysis of biomonitoring data and survey data in Wisconsin anglers (fishermen): The EISO will assess exposures to pollutants in a sample of Wisconsin anglers residing in the Milwaukee area. Multivariate analysis will correlate fish consumption with pollutants such as mercury, PCBs, and polycyclic aromatic hydrocarbons.

Proposed Field Investigation Project:

EISOs are provided with numerous opportunities to work on field assignments "" either independently or as part of a team "" to investigate urgent or emerging issues. EISOs are encouraged to pursue international deployments when opportunities arise. Field opportunities are identified through routine surveillance activities

or by concerns raised by the public or state partners. EISOs are given priority to lead these investigations (often within an Incident Management System) with the support of our subject matter experts. Potential field activities include:

- Field investigation of legionellosis clusters
- Investigations of novel or illicit drug exposures
- Investigations of workplace toxic exposures
- Investigation of health effects of toxic environmental exposures
- Leading and participating in infectious disease outbreaks, including novel or emerging pathogens

Previous EISOs have conducted a variety of field investigations, including:
- Coagulopathy outbreak investigation caused by brodifacoum rodenticide poisoning in persons who smoked synthetic cannabinoids.
- Legionella outbreak in patients of a tertiary-care hospital.
- Outbreak of carbon monoxide poisoning among hockey players and spectators in an ice arena.
- Investigation of lead exposure outbreak among workers at a northern Wisconsin shipyard.
- Seoul hantavirus infection in pet owners and workers associated with rat exposure.
- Elizabethkingia outbreak in Wisconsin residents associated with community and healthcare settings.
- Legionella outbreak among visitors to at a waterpark.
- Toxoplasmosis outbreak among people who consumed undercooked venison.

Wisconsin State and local agencies and academic partners have a strong record of collaboration. EISOs are encouraged to work on projects with academic partners and local public health agencies (LPHAs).
- The Wisconsin State Laboratory of Hygiene (WSLH) is one of the premier laboratories in the nation. Past EISOs have collaborated with WSLH to conduct lead isotopic analyses, quantification of long-acting anticoagulants, and testing for zoonotic diseases.
- NIOSH periodically conducts Health Hazard Evaluations in Wisconsin. EISOs are invited to join these investigations and participate in site assessment and worker interviews.
- Investigations of occupational illnesses often involve the Occupational Safety and Health Administration. BEOH has strong relationships with federal OSHA offices throughout Wisconsin. EISOs may work jointly with OSHA to manage and support the public health aspects of investigations.
- The Wisconsin Poison Center (WPC) collaborates with BEOH on mass environmental exposures, such as carbon monoxide poisoning, and drug overdoses. The EISO has an opportunity to work with WPC medical toxicologists on joint investigations.
- EISOs are encouraged to participate in state-wide preparedness exercises. BEOH and Wisconsin Emergency Management (WEM) organize radiation preparedness exercises with nuclear power plants. EISOs have an opportunity to work with WEM and learn more about disaster response coordination with federal agencies during emergencies.
- LPHAs frequently consult with BEOH and BCD regarding occupational, environmental, and infectious disease exposures, particularly for reportable conditions and diseases. The EISO may provide technical support to LPHAs for investigation of reportable diseases and case management.

Proposed Surveillance Project:

A Wisconsin BEOH priority is to evaluate the new carbon monoxide (CO) surveillance system. CO poisoning became a reportable condition in Wisconsin on July 1, 2018. CO is a colorless, odorless gas that is produced through the incomplete combustion of hydrocarbons. Unintentional CO poisoning, often associated with gas-powered generators and improperly maintained gas furnaces, is responsible for approximately 500 emergency department visits and 5 deaths in Wisconsin each year. Under the new surveillance reporting requirements, all laboratories submit human carboxyhemoglobin levels to the Wisconsin Electronic Disease Surveillance System (WEDSS). Local health departments conduct patient interviews, identify sources of exposure, and perform case classification. Evaluation of this new surveillance system will involve reviewing submitted reports for

appropriate case classification, assessment of data quality, comparison of the system with other data sources, such as hospital discharges and poison center call notes, and site visits or field evaluations with local health departments. The results will be used to make improvements to WEDSS interview forms, enhance guidance for locals, and result in more effective public health interventions.

Current Position Data:

Data is shared freely within the Wisconsin Division of Public Health and include a wide variety of large datasets:
- Wisconsin Poison Center call data (provided through the National Poison Data System)
- Workers' compensation claims and unemployment insurance data
- Hospital discharge "" inpatient and emergency department visits (entire state)
- State Notifiable environmental, occupational, and infectious disease condition data
- Syndromic surveillance through the National Syndromic Surveillance Program
- Vital statistics "" births and deaths
- Behavioral Risk Factor Surveillance System
- Wisconsin Prescription Drug Monitoring Program (all outpatient opioid prescriptions)

Position Strengths: Wisconsin EISOs consistently have diverse experiences in applied epidemiology. BEOH's and BCD's strong surveillance and investigation network provides opportunities for epidemiologic investigations of environmental, occupational, and infectious diseases clusters and outbreaks; the EISO will also collaborate with WSLH laboratorians. Cross-collaboration with BCD and other Bureaus increases the variety of projects available. Supervisors strongly support publishing in MMWR and in peer-reviewed literature. Because the Wisconsin Division of Public Health collaborates with Federal agencies and local partners, EISOs are well prepared to pursue a career with federal, state, or local public health agencies at the conclusion of their assignment.

Staff & Resources: BEOH has an experienced staff of more than 70 persons, including epidemiologists who are highly proficient in SAS and statistical analysis, toxicologists who are available for consultation and collaboration on environmental investigations, and health educators with extensive experience in data visualization. BEOH has a strong record of publication: SMEs are readily available who can review manuscripts for scientific soundness and clarity. BEOH also has support from 7 other Bureaus and Offices in DPH and works closely with local health department staff. BCD has an experienced staff of more than 110 persons working in foodborne, vector-borne, respiratory, mycotic diseases.

Special Skills Useful for this Position: Basic familiarity with the principles of public health is required. Statistical and analytical experience, particularly using large datasets and familiarity with SAS, R, STATA, REDCap and/or ArcGIS, is helpful. Experience interviewing members of the public and developing outreach and education materials is desirable.

Domestic Travel: 10% **International Travel:** 0%

Field Assignment Description

Size of Community: Madison population: ~250,000; metro area population: ~600,000.

University Affiliation: Previous EISOs have had adjunct faculty appointments in the UW School of Medicine and Public Health. Close relationships exist with the UW faculty in medicine, population health, pediatrics, family medicine, and veterinary medicine.

Living Environment: Ranked as one of the "Top 10 Happiest Cities" by National Geographic, Madison is built along lakes and surrounded by farmland and has an extensive bike trail system. Madison has the most restaurants per capita of any US city and one of the largest farmers

Cultural and Recreational Assets: Madison is the State Capital of Wisconsin. Many varied cultural opportunities exist, and are enhanced by proximity to Milwaukee (1 hr), Chicago (2.5 hrs) and Minneapolis (4.5 hrs). Recreational opportunities abound, particularly for biking, water, and win

Opportunity for Partners' Employment: Excellent in most service professional occupations.