



FETP INTERNATIONAL NIGHTS

May 3 and May 4

Improving Global Health Security through Field Epidemiology
Training, Surveillance, and Outbreak Response



Poster Presentations:

Tuesday, May 3, 2016 at 6:00 pm-8:30 pm

Featured Speakers, Awards and Oral Presentations:

Wednesday, May 4, 2016 at 6:30 pm-9:00 pm

Crowne Plaza Ravinia Hotel, Atlanta, Georgia, USA



Centers for Disease
Control and Prevention
Center for Global Health



TEPHINET





TABLE OF CONTENTS

Welcome	
From Director, Center for Global Health	1
From Branch Chief, Workforce and Institute Development Branch	2
From Director, TEPHINET	3
Tuesday Agenda	4
Wednesday Agenda	6
Director's Award	8
Koplan Award	9
Foege Award	10
Poster Abstract Listing	11
Oral Abstract Listing	27





Dear Colleagues,

The Field Epidemiology Training Program (FETP) is a cornerstone of CDC's efforts to effectively respond to health threats across the globe. Graduates have training in field epidemiology, surveillance, and evidence-based decision-making, enabling them to emerge as the world's next generation of public health leaders. With a strong presence in over 70 countries, FETP helps build experienced teams of public health professionals who can detect disease outbreaks locally and prevent them from spreading globally.



I have been fortunate to see firsthand the value and contributions of FETP. When I helped establish the program in Tanzania, we leveraged the skills and knowledge of graduates from Kenya's FETP. The exchange between Kenya and Tanzania provided the opportunity for peer-to-peer mentoring and knowledge transfer, which have been shown to be critical in improving government performance, country ownership, and public health capacity and impact. Graduates from the two programs now lead several of these nations' key health and public health entities, and their efforts are having a lasting impact.

FETP gives us countless examples of successful outbreak response throughout the world. Graduates have evaluated the effectiveness of bed nets in Mozambique, improved surveillance in Central America, and tracked cases to prevent further spread of Ebola in West Africa. FETPs engaged in the polio outbreak response and mass immunization campaign in Tajikistan and Uzbekistan helped close critical gaps in population immunity. Because of the work of FETP residents, advisors, and graduates, the global public health workforce is better able to respond to ongoing and emerging public health needs.

I thank you – and the world thanks you – for your continued vital work on the front lines of public health. Your contributions help save lives throughout the world.

Rebecca Martin, PhD
Director, Center for Global Health
Centers for Disease Control and Prevention





Dear Colleagues,

Greetings and welcome to the 65th Annual Epidemic Intelligence Service (EIS) Conference and Field Epidemiology Training Program (FETP) International Night.

Tonight we celebrate the remarkable work of FETPs around the world and reflect on the global landscape that makes FETP such a critical public health training program. The value of trained field epidemiologists is underscored by WHO's recent declaration that the West Africa Ebola virus disease outbreak no longer constituted a Public Health Emergency of International Concern. While this success deserves applause, periodic flare ups remind us of the continued need for strong surveillance and response systems and why FETP is vitally important to global health security. We must now seize this opportunity to strengthen and expand existing programs and bring new ones to areas that need support.



FETP remains CDC's signature program for strengthening surveillance, field epidemiology and response capacity within ministries of health. Through these programs, CDC, alongside ministries of health and other partners, has helped train more than 3,100 graduates from over 70 countries, many of whom now hold leadership positions in their host countries. In the past year we continued to initiate FETPs, largely due to the growth of local level frontline training, which targets district and provincial health officials and extends the development of core surveillance and response capabilities to sub-national levels.

As we honor the excellent work and accomplishments of FETP trainees around the globe tonight, we are reminded that threats to public health persist and continue to challenge us in new ways. Zika virus has caused us to rethink our paradigm for surveillance and response by requiring close collaboration with disciplines not typically on the frontlines of public health emergencies. These challenges will be met with innovations in surveillance, response, and partnership building, but the core capacities built by FETP remain central to our collective success in ensuring global health security.

Thank you for supporting our presenters and please enjoy International Night!

Kip Baggett, MD, MPH
Incoming Chief, Workforce and Institute Development Branch,
Division of Global Health Protection, Center for Global Health
Centers for Disease Control and Prevention





Dear Colleagues,

Greetings! It is my pleasure to welcome you, our esteemed colleagues, to FETPs International Night 2016.

This event continues the tradition of the Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET) and the U.S. Centers for Disease Control and Prevention (CDC) working together to recognize and support the extraordinary work of FETPs worldwide.

Together with ministries of health and other public health authorities, we have been working to respond to some of the most challenging public health threats in history. Now, more than ever before, it is critical that we continue strengthening these relationships to bolster public health infrastructure through the establishment of FETPs.



Last year's Ebola outbreak in West Africa and this year's Zika outbreak in the Americas have demonstrated the importance of building a cadre of well-trained field epidemiologists skilled in contact tracing and collecting, analyzing, and interpreting epidemiologic data. This work contributes to evidence-based decision making for rapid and effective outbreak response.

I am deeply grateful to the FETP residents, graduates, and advisors who work very hard in responding to these diseases. As I have mentioned in the past, your sacrifices and your commitment to public health will never be forgotten or taken for granted. You are doing precisely what you were trained to do: responding effectively to health threats and providing leadership in developing policies, programs, and health interventions to save lives and improve global health security.

We will continue our efforts to improve FETP quality through accreditation. We are pleased to announce the first three accredited programs in the TEPHINET family, as of this year: the U.S. Epidemic Intelligence Service (EIS), the Canada Field Epidemiology Program, and the United Kingdom Field Epidemiology Training Program. Ensuring that all of our FETPs are performing at the highest level is one of TEPHINET's top priorities. The standard of excellence that we uphold in field and applied epidemiology training is evident in the quality of tonight's presentations and in the presenters' potential to become leaders who can effectively respond to health threats in times of crisis.

For consideration this year, we received 211 abstracts from 40 countries illustrating the broad range of scientific work of FETP residents and graduates. These abstracts are excellent examples of the wide scope of FETP work and the value of this program in supporting an array of global health activities.

I am proud of the improvements in disease detection and response that TEPHINET, CDC, and more than 63 programs in 88 national ministries of health, international partners, and other agencies have achieved by working together through FETPs. It is clear that our collaborative efforts are being rewarded by the development of public health leaders who are well-trained, committed to public health, and have the technical skills necessary to respond to infectious disease outbreaks and prevent them from spreading across borders.

On behalf of the TEPHINET Advisory Board of Directors and the Secretariat, I congratulate all the participants for their commitment to public health and saving lives. Thank you for joining us and supporting FETP International Night.

Dionisio José Herrera Guibert, MD, FMS, MAE, PhD
Director of TEPHINET





POSTER PRESENTATIONS

TUESDAY, MAY 3, 2016

- 5:15 pm Light Refreshments served
- 6:00 pm - 8:30 pm Poster Presentations
- 6:00 pm Welcome and Introduction of the Poster Presentations
Dr. Linda Quick
Program Lead, Field Epidemiology Training Program (FETP)
Workforce and Institute Development Branch
Division of Global Health Protection, Center for Global Health
U.S. Centers for Disease Control and Prevention
- 6:05 pm – 7:55 pm Oral Poster Presentations
see listing
- 7:55 pm – 8:05 pm Wrap Up
Dr. Robert Fontaine
Senior Advisor, Field Epidemiology Training Program (FETP)
Workforce and Institute Development Branch
Division of Global Health Protection, Center for Global Health
U.S. Centers for Disease Control and Prevention
- 8:05 pm – 8:15 pm Certificate Ceremony
Dr. Linda Quick and Dr. Dionisio Herrera
- 8:15 pm Closing Remarks
Dr. Dionisio Herrera
Director, Training Programs in Epidemiology and
Public Health Interventions Network (TEPHINET)

*The Jeff Koplan Award for Best Poster will be given on Wednesday, May 4 during the award ceremony of International Night.

**Presenters please remain for the photo session immediately following the closing remarks.



POSTER PRESENTERS

Full abstracts are found on the designated page numbers.

Ahmed, Abubakar – Nigeria. Cholera Outbreak in Internally Displaced Persons (IDPs) Camps in Maiduguri, Borno State, Northern Nigeria, September 2015: Role of safe water storage and hand washing (page 11)

Alomatu, Holy – Ghana. Foodborne Disease Outbreak Transmitted by Contaminated Drinking Water in a Senior High School, Ghana, 2015 (page 12)

Atelu, Geoffery – Ghana. Prevalence of Submicroscopic *Plasmodium falciparum* parasitaemia Levels among Asymptomatic Populations in Navrongo, Ghana, 2015 (page 13)

Fambirai, Tichaona – Zimbabwe. Determinants of Multi Drug Resistant Tuberculosis in Harare City, Zimbabwe, 2015: Experiences of Harare City (page 14)

Ha, Ninh – Vietnam. The Impact of the Universal Helmet Law on Head Injuries and Deaths from Motorcycle Crashes in Cu Chi District, Ho Chi Minh City, Vietnam, 2014-2015 (page 15)

Karanja, Joan – Kenya. Assessment of Cross-border Surveillance for Ebola in Liberia, June 2015 (page 16)

Kateule, Ernest – Zambia. Mumps Outbreak in an Unimmunized Population – Luanshya District, Copperbelt Province, Zambia, 2015 (page 17)

Khamis, Asha – Tanzania. Effect of Rotavirus Vaccine on Childhood Diarrheal Disease in Zanzibar, 2014 (page 18)

Khan, Sajjad – Pakistan. Outbreak of Typhoid in Union Council (UC) Tarlai, District Islamabad, Pakistan, 2015 (page 19)

Kihembo, Christine – Uganda. Risk Factors for Podoconiosis: Kamwenge District, Western Uganda, 2015 (page 20)

Lui, Yan – China. Mumps-containing Vaccine Effectiveness in a Mumps Outbreak in Anhui Province, China, 2014-2015 (page 21)

Medeiros, Eva – Brazil. First Investigation of Aseptic Peritonitis Outbreak Associated with Peritoneal Dialysis Solution in Rio Grande do Sul State, Brazil, 2015 (page 22)

Merwah, Riyadh – Iraq. Cholera Outbreak in Abugraib District, Baghdad, Iraq, 2015 (page 23)

Myroniuk, Mariana – Georgia. Return of Polio to Ukraine: Causes and Responses, December 2015 (page 24)

Patil, Amol – India. Outbreak Investigation of Foodborne Illness among Political Rally Attendees, Cuddalore District, a Global Food Infections Network Project Site, Tamil Nadu, India, July 2015 (page 25)

Tu, Tran – Vietnam. Defining the Alert Threshold of Dengue Outbreaks Using Surveillance Data in Northern Vietnam, 2015 (page 26)





ORAL PRESENTATIONS

WEDNESDAY, MAY 4, 2016

- 5:30 pm Refreshments served
- 6:30 pm to 9:00 pm Oral Presentations
- 6:30 pm Opening Remarks
Dr. Thomas Frieden
Director, Centers for Disease Control and Prevention
- 6:35 pm Introduction of Special Guests and Moderators
Dr. Dionisio Herrera
Director, Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET)

Moderators

Dr. William H. Foege

Presidential Distinguished Professor Emeritus
Department of International Health
Rollins School of Public Health
Emory University
Director, Centers for Disease Control and Prevention (1977 – 1983)

Dr. Thomas Frieden

Director, Centers for Disease Control and Prevention

Dr. Rebecca Martin

Director, Center for Global Health
Centers for Disease Control and Prevention

Dr. Fernando Simón Soria

Director of the Coordinating Centre for Health Alerts and Emergencies
Ministry of Health, Social Services and Equality, Spain





ORAL PRESENTATIONS

Full abstracts are found on the designated page numbers.

- 6:40 pm **Pande, Gerald – Uganda.** A Cholera Outbreak Caused by Drinking Contaminated Water from a Fenced Lakeshore Water-Collection Site – Kasese District, Western Uganda, June 2015 (page 27)
- 7:00 pm **Konrad, Stephanie – Canada.** Characteristics of a Core Group of Gay, Bisexual and Men Who Have Sex with Men (MSM) with ≥ 4 Infectious Syphilis Infections – British Columbia (BC), Canada, 2005 to 2014 (page 28)
- 7:20 pm **Nayak, Priyakanta – India.** Outbreak Investigation of Cutaneous Anthrax in Koraput, Odisha, India 2015 (page 29)
- 7:40 pm **Kilasi, Shaba – Tanzania.** Factors Influencing Utilization of Cervical Cancer Screening among HIV-infected Women in Mbeya, Tanzania, 2014 (page 30)
- 8:00 pm **Haussig, Joana – Germany.** People Who Inject Drugs are Often Not Vaccinated Against Hepatitis B Despite Recommendations - Results from the First Large Integrated Sero-behavioral Study in Eight German Cities, 2011-2015 (page 31)
- 8:20 pm **Kikvidze, Tamar – Georgia.** Knowledge, Attitude and Practices on Vaccination and Measles in Adjara Region of Georgia, 2014 (page 32)
- 8:40 pm **Presentation of the 2016 FETP International Night Awards**
Dr. Henry “Kip” Baggett, Dr. Dionisio Herrera, and Dr. Jordan Tappero
- 8:55 pm Closing Remarks
Dr. Jordan Tappero
Division Director, Division of Global Health Protection, Center for Global Health
U.S. Centers for Disease Control and Prevention





DIRECTOR'S AWARD FOR EXCELLENCE IN EPIDEMIOLOGY AND PUBLIC HEALTH RESPONSE

This award is presented in recognition of significant contributions toward successful responses to public health emergencies (natural and manmade disasters, disease outbreaks, etc.). Nominees can include FETP or FELTP Resident Advisors who have provided leadership working as part of a response and have been successful in overcoming challenging circumstances. The award is also to recognize excellence in epidemiologic practice or research and contributions that address a public health issue of major importance by applying epidemiologic principles and methods. Nominations can recognize accomplishments that improved human health; made a substantial reduction in burden of disease; or represented innovations to public health practice based on epidemiologic foundations or implementation of epidemiologic approaches. Recognized contributions should be practical, explicit, and applied rather than theoretical or implicit.

Director's Award Recipients

2015 - Nigeria Field Epidemiology Laboratory Training Program





JEFFREY P. KOPLAN AWARD FOR EXCELLENCE IN SCIENTIFIC PRESENTATION

The Jeffrey P. Koplan Award for Excellence in Scientific Presentation was established in 2014 in honor of Dr. Jeffrey P. Koplan, former Director and 26 year veteran of the U.S. Centers for Disease Control and Prevention for his outstanding contributions to improving public health globally and his commitment to excellence in scientific research, analysis, and presentation. The Jeffrey P. Koplan Award is presented to the winner of the scientific poster presentation that most effectively emphasizes the results of an investigation and its impact on public health.



Dr. Koplan is a Past-President of the International Association of National Public Health Institutes. He currently serves as Vice President for Global Health at Emory University and is the former Director of the Emory Global Health Institute, an organization created to advance Emory University's efforts to improve health around the world.

Before assuming this position, Dr. Koplan was Vice President, Academic Health Affairs for Emory University's Woodruff Health Sciences Center, and Director and 26 year veteran of CDC. He is board certified in internal medicine and preventive medicine, and is a Master of the American College of Physicians. He is a member of the National Academy of Medicine (formerly Institute of Medicine) and a former member of its Governing Council.

Dr. Koplan has served on many advisory groups and consultancies in the U.S. and overseas, and has written more than 200 scientific papers. He served as a trustee of Yale University, and is currently on the boards of the Marcus Family Foundation, Michael C. Carlos Museum, Kaiser Foundation Health Plan of Georgia, Inc., and HealthMPowers

Jeffrey P. Koplan Award Recipients

2015 China – Xuehui Lai. Case Control Study of Risk Factors of Avian Influenza A (H7N9) Transmission in Live Poultry Markets, Zhejiang Province, China, 2014

2014 Ethiopia – Woubayehu Kassa. Dengue Fever Outbreak, Diredewa, Ethiopia, November, 2013





WILLIAM H. FOEGE AWARD RECIPIENTS 2000-2015

The William H. Foegen Award was established in honor of Dr. William H. Foegen, the renowned epidemiologist and former CDC Director credited with devising the global strategy that led to the eradication of smallpox in the late 1970s. The award is the highest FETP International Night honor and is presented to the best oral presentation.

2015 ZIMBABWE

Dr. Takura Matare. Factors Associated with First-Line Humane Immunodeficiency Virus Treatments Failure in Zvishavane District Midlands Provinces in Zimbabwe, 2014.

2014 ZIMBABWE

D. Bangure, Effectiveness of Short Message Services Reminder on Childhood Immunization Programme in Kadoma, Zimbabwe, 2013- A Randomized Controlled Trial.

2013 CHINA

M. Wang. Mumps attenuated live vaccine effectiveness: 1:1 matched case-control study-Zhongshan, China, 2011-2012.

2012 NIGERIA

L. Ibrahim, Factors Associated with Interruption of Treatment among Pulmonary Tuberculosis Patients in Plateau State – Nigeria, 2011.

2011 INDIA

P. Baral. Hepatitis outbreak caused by contaminated Tamarind water served in a mobile food kiosk in an affluent urban school of Mayurbhanj, Orissa, India, September.

2010 CHINA

K. Han. Shigellosis outbreak in an elementary school- Sichuan Province, China, June 7-16, 2009.

2009 AUSTRALIA

A. Jardine et al. The impact of pneumococcal conjugate vaccination on rates of hospitalization for pneumonia, Australia, 1998–2007.

2008 CENTRAL ASIA

G. Sailybayeva et al. HIV outbreak investigation among hospitalized children in Shymkent City, Southern Kazakhstan, June–November 2006.

2007 CENTRAL ASIA

M. Dehkanova et al. Outbreak investigation of leptospirosis in Fayeabad district, Tajikistan, April 14–22, 2006.

2006 ITALY

M. Sala et al. High-level beta-hexachlorocyclohexane contamination in dairy farms in the Sacco river valley, Latium, Italy, 2005.

2005 CHINA

Y. Zhang et al. Large outbreak of waterborne paratyphoid fever attributed to a contaminated well in a rural junior high school in Guangxi Province, China, 2005.

2004 BRAZIL

L. Daufembach et al. Barium toxicity after exposure to contaminated contrast solution in Goiás State, Brazil, 2003.

2003 EPIET

U. Dürr et al. Outbreak of aseptic peritonitis among peritoneal dialysis patients associated with the use of icodextrin in Extremadura, Spain, January–April 2002.

2002 BRAZIL

T. Lanzieri et al. Congenital rubella syndrome following a community-wide rubella outbreak in Rio Branco, Acre, Brazil, 2000–2001.

2001 CANADA

E. Galanis et al. Oculo-respiratory symptoms associated with influenza immunization in Canada, 2000.

2000 SPAIN

T. Pelayo et al. Study of two outbreaks of mumps in children vaccinated with the Rubini strain in Spain: Estimation of vaccine efficacy, 2000.





POSTER ABSTRACTS

Ahmed, Abubaker

Country: Nigeria

Abstract Title: Cholera Outbreak in Internally Displaced Persons (IDPs) Camps in Maiduguri, Borno State, Northern Nigeria, September 2015: Role of Safe Water Storage and Hand Washing

Short Biography: Born in New-Bussa, Abubakar Ahmed Tijani is a native of Kaiama in Kwara state Nigeria. Mr. Tijani began his career as a veterinary officer in Kwara state, and went on to join the NFELTP in 2014. He has volunteered and participated in the Ebola outbreak response in Lagos state Nigeria, Liberia, and Sierra Leone. He is happily married with two great kids and currently lives in Ilorin, Nigeria.

Abstract

Background: Cholera outbreaks remain a challenge in Nigeria with over 40,000 cases in 2015. On September 11, 2015, the Borno State Ministry of Health was alerted of deaths from cases of acute diarrhea in two IDPs camps in Maiduguri. We investigated to determine risk factors and institute control measures.

Methods: We conducted a 1:2 unmatched case-control study. Cases were persons greater than two years of age with acute diarrhea with or without vomiting from September 1st through 21st 2015. Controls were neighbors without diarrhea. We collected data on sociodemographics, clinical symptoms and determinants of infection and conducted bivariate and multivariate analysis. Four fecal samples and two water samples were collected.

Results: We documented 385 cases and 770 controls. Attack rate was 385/11,172 (3.5%); Case-Fatality-Rate was 13/385 (3.4%). Mean age for cases was 30 years (± 14 years) and 32 years (± 13 years) for controls. A total of 226/385 (59%) of cases and 547/770 (71%) were females. Most affected age range was 20-29 years (n=120/385, 33%). The epidemic curve shows a propagated transmission. Controls were more likely to have washed hands with soap before eating (OR=0.7, 95% confidence interval [CI] 0.5-0.9, p=0.01) and properly stored their drinking water (OR=0.5, 95% CI 0.4 to 0.7), while cases were more likely to have had contact with a case (OR=2.6, 95% CI 2.0 to 3.5) or ate outside the camp (OR=1.7, 95% CI 1.3 to 2.1). The predictor for infection was contact with a case (AOR=2.4, 95% CI=1.8 to 3.2). *Vibrio cholerae* O1 was isolated from one of four fecal samples analyzed.

Conclusion: Inappropriate storage of water, unhygienic food and hand washing were the determinants of infection in this outbreak. We conducted health education on eating hygienic food, proper water storage, and washing hands with soap.





Alomatu, Holy

Country: Ghana

Abstract Title: Foodborne Disease Outbreak Transmitted by Contaminated Drinking Water in a Senior High School, Ghana, 2015

Short Biography: Holy Alomatu is a Biomedical Scientist (BMS) with St. Joseph's Hospital in the Eastern Region of Ghana and a resident of the Ghana Field Epidemiology and Laboratory Training Program pursuing his MPhil in applied epidemiology and disease control at the University Of Ghana School Of Public Health.

Holy attended the University of Cape Coast, where he graduated with a Bachelor of Science in laboratory technology. Holy has more than six years of experience in laboratory practice at sub-national levels and is the Laboratory Manager of the St. Joseph's Hospital Laboratory in Koforidua. Holy loves swimming and listening to music.

Abstract

Background: Although foodborne diseases are important, they are an underreported public health problem, especially in developing countries. On February 4, 2015, a suspected foodborne disease was reported among senior high school students in Fanteakwa District. All the students ate from a particular food vendor and had not eaten any other common meal on that day or the previous day. The purpose of our investigation was to verify the outbreak, determine its magnitude, identify the source, and implement control and preventive measures.

Methods: A retrospective cohort study was conducted. We reviewed medical records and interviewed patrons of the food vendor for demographic and clinical data. A case of foodborne disease was defined as any person with abdominal pain, vomiting, and or onset of diarrhea from the 4th to the 11th of February 2015 and who had eaten from the food vendor. We conducted active case search to identify more cases and collected food samples for laboratory testing. Descriptive and inferential statistical analyses were performed using Stata 12.0.

Results: A total of 68 cases were recorded giving an overall attack rate of 36% (68/190) with no deaths. Of these, 51% (35/68) were males. The mean age of case-patients was 18 (+/-1.6) years. The index case, a 17-year-old female student of the school, ate from the food vendor on the 4th of February at 9:00 am and fell ill at 3:40 pm later that day. Compared to those who ate other food items, patrons who drank stored water were more likely to develop foodborne disease at statistically significant levels [RR=2.6, 95% CI= (2.1-3.2)]. *Clostridium perfringens* was isolated from the water.

Conclusion: This foodborne gastroenteritis outbreak was most probably caused by *Clostridium perfringens* contaminated water and occurred from the 4th to 7th of February 2015 in Fanteakwa district. Rapid outbreak response helped in controlling the outbreak.





Atelu, Geoffrey

Country: Ghana

Abstract Title: Prevalence of Submicroscopic *Plasmodium falciparum* Parasitaemia Levels among Asymptomatic Populations in Navrongo, Ghana, 2015

Short Biography: Geoffrey Atelu is a biomedical laboratory scientist who has practiced in many health facilities in Ghana including Ghana's premier teaching hospital, Korle Bu Teaching Hospital in Accra, Ghana.

Geoffrey graduated from the School of Allied Health Sciences, University of Ghana, where he obtained a Bachelor of Science degree in medical laboratory technology. He is a terminal MPhil and Field Epidemiology and Laboratory Training Program (FELTP) candidate in the Ghana FELTP.

With more than 20 years' experience in medical laboratory medicine, Geoffrey is currently managing the La General Hospital laboratory department, a very busy municipal hospital in the Accra metropolis. Having developed much interest in malaria diagnosis and management, Geoffrey is a member of a team of professionals who executes a National Quality Assurance Training program (Outreach Training and Supportive Supervision) on malaria diagnosis.

Geoffrey is married with three children and hails from Baika, a village in the Volta Region of Ghana.

Abstract

Background: Asymptomatic malaria infections also referred to as the parasite 'reservoir hosts', which could be microscopic or submicroscopic infections, have been implicated in malaria transmission. However the relative contribution of submicroscopic infections to transmission of the disease is unknown and therefore needs to be described to inform elimination efforts. We investigated the prevalence of submicroscopic *Plasmodium falciparum* parasite infections and gametocyte carriage in asymptomatic individuals in a seasonal transmission area in northern Ghana.

Methods: A cross sectional study was conducted in the dry season during the months of February and March 2015 in Navrongo in northern Ghana. Capillary blood samples collected from asymptomatic individuals from all age groups were used for microscopic and molecular detection of malaria parasites. Submicroscopic infections, for both asexual and gametocyte stage parasites were detected by reverse transcriptase polymerase chain reaction (RT-PCR) and conventional nested PCR. Descriptive data analysis was done using Epi Info 7.

Results: Of the 209 participants, mean age was 28 (standard deviation 11) and 111 (53%) were females. Parasitaemia ranged from 40 to 3,520 parasites/ μ l of blood with a mean value of 732 parasites/ μ l. The prevalence of asymptomatic *P. falciparum* carriage was 4.8% (10/209) and 14% (29/209) using microscopy and RT-PCR respectively. Of the asymptomatic infections, the proportion of submicroscopic infections was 66% (19/29). Overall, the prevalence of submicroscopic infections was 9.1% (19/209). *P. falciparum* gametocytaemia detected by microscopy was 1% (2/209) and that of PCR was 3.8% (8/209).

Conclusion: The prevalence of submicroscopic infections and gametocytes in asymptomatic individuals in the dry season of a seasonal malaria transmission area shows a level of persistent latent transmission of disease. This should be considered in surveillance towards elimination efforts.





Fambirai, Tichaona

Country: Zimbabwe

Abstract Title: Determinants of Multi-Drug Resistant Tuberculosis in Harare City, Zimbabwe, 2015: Experiences of Harare City

Short Biography: Mr. Tichaona Fambirai holds a Bachelor of Science in environmental health from Solusi University and a Master of Public Health from University of Zimbabwe. He was a resident in the Zimbabwe Field Epidemiology Training Program (FETP) from January 2014 to December 2015. As part of his training, he presented two papers at the Annual Medical Research Day in Harare, Zimbabwe in September 2015. The titles of these papers were: *Risk Factors for Contracting Typhoid in Stoneridge, Harare, 2014* and *Trend Analysis of Multi Drug Tuberculosis Notifications and Outcomes in Harare, 2010-2014*. Currently he is working in Chikomba District as a District Environmental Health Officer.

Abstract

Authors: Tichaona Fambirai¹, P Chonzi², N.T Gombe¹, M. Tshimanga¹, J.Chirenda¹, M. Mungati¹
¹Department of Community Medicine, University of Zimbabwe ²Harare City Health Department

Background: The emergency of multi drug resistant tuberculosis (MDR-TB) threatens tuberculosis (TB) control programs globally. An analysis of Harare City's TB program reports revealed that annual drug susceptible TB notifications declined by 23% from 6700 (in 2009) to 5100 (in 2014). MDR-TB notifications had been on an increase from 1 (in 2009) to 60 (in 2014). Therefore, we conducted a study to determine the risk factors associated with occurrence of MDR-TB in Harare.

Methods: An unmatched case-control study was conducted. Controls were Category 1 TB patients who had a cured result at the end of treatment, while cases were defined as TB patients currently on treatment with a drug susceptibility test showing resistance to Rifampicin and Isoniazid. Cases and controls were randomly selected from city health facility TB registers. Data were analyzed using EPI Info 3.5.4.

Results: A total of 42 cases and 84 controls were enrolled into the study. Significant risk factors associated with occurrence of MDR-TB in Harare City were: history of TB treatment (OR=66 95% CI: 19–223), history of being a contact to a TB patient (OR=2.6 95% CI 1.06–6.2), and interruption of TB treatment for >2 months in previous treatment (OR=6.6 95% CI: 1.9–23). Those employed were less likely to have MDR-TB (OR=0.12 95% CI: 0.04–0.29). Independent risk factors associated with occurrence of MDR-TB were: history of TB treatment (aOR=35 95% CI: 10–127) and being employed (aOR=0.16 95% CI: 0.04–0.60)

Conclusion: History of exposure to anti TB medicine was the single biggest risk factor. MDR TB in Harare City likely represents acquired drug resistance than primary drug resistance. City health authorities have initiated training of community TB treatment observers and procured additional GeneXpert/MTB Rif machines.





Ha, Ninh

Country: Vietnam

Abstract Title: The Impact of the Universal Helmet Law on Head Injuries and Deaths from Motorcycle Crashes in Cu Chi District, Ho Chi Minh City, Vietnam

Short Biography: Ninh Thi Ha is a public health officer at the Institute of Public Health (IPH) in Ho Chi Minh City and a fellow of Vietnam's Field Epidemiology Training Program (FETP), which is supported by the U.S. Centers for Disease Control and Prevention (CDC). She holds a master's degree in Health Service Management from Curtin University, Australia, where she is currently a PhD candidate in public health. Ninh is conducting a study on optimal utilization of primary health care resources for chronic ambulatory care sensitive conditions using data linkage. She has three publications in peer-reviewed journals. Ninh was awarded a Mini Grant 2014-2015 from the Training Programs in Epidemiology and Public Health Interventions Network to conduct an evaluation on the impact of the universal helmet law on head injuries and deaths among motorcycle users in Cu Chi district in Ho Chi Minh City. She enjoys sharing her projects and ideas with colleagues and communities to promote safer and healthier lives.

Abstract

Background: In 2007, Vietnam mandated helmet use among all motorcycle users. Helmet use increased by nearly 60% after the law was passed, but only one study has measured the law's impact on head injuries. Our study measured the change in head injuries and deaths among motorcycle users following the mandate.

Methods: Hospital records for road traffic injuries (RTI) were extracted from the Cu Chi Trauma Centre. Motorcycle-related death records were obtained from mortality registries in commune health offices. Head injury severity was categorized using an Abbreviated Injury Score. Cu Chi's population, which was stratified by year, age, and sex, was used as the denominator. Rate ratios (RR) with 95% confidence intervals (CI) were used to compare rates pre- and post-law (2005/06-2009/10).

Results: Motorcyclists accounted for most injuries (3035, 87%) and deaths (238, 90%) among cases with known transportation mode. Head injuries accounted for 70% of motorcycle-related hospitalizations. Males accounted for most injuries (73%) and deaths (88%). The median age was 28 years and 32 years for injuries and deaths, respectively. Pre-law, the rates for motorcycle injuries, head injuries, severe head injuries, and deaths were 235, 183, 21, and 22 per 100,000 population, respectively. Post-law, rates of motorcycle injuries (RR 0.53; 95% CI 0.49 to 0.58), head injuries (RR 0.35; 95% CI 0.31 to 0.39), severe head injuries (RR 0.47; 95% CI 0.34 to 0.63) and deaths (RR 0.69; 95% CI 0.53 to 0.89) decreased. Motorcycle helmet use was unknown for 97% of cases.

Conclusions: The universal helmet law may have contributed to the reduction of head injuries and deaths among motorcycle riders in Cu Chi, Vietnam. To further examine the impact of the motorcycle helmet law, including compliance and helmet quality, further emphasis should be placed on gathering helmet use data from injured motorcyclists.





Karanja, Joan

Country: Kenya

Abstract Title: Assessment of Cross-Border Surveillance for Ebola in Liberia, June 2015

Short Biography: Dr. Karanja is a medical doctor (MD) from the University of Nairobi. She is currently working with the Ministry of Health of Kenya within the Disease Surveillance and Outbreak Response Unit. She is a second-year resident of the Kenya FELTP.

Abstract

Background: On March 9th 2015, Liberia was declared “Ebola free” and international borders reopened. The African Union with the Ministry of Health, Liberia evaluated cross-border surveillance by assessing the implementation of infection prevention and control measures at the entry points, reviewing hospitalization referral mechanisms, and determining the registration process and ability to track travelers.

Methods: The evaluation was conducted in June 2015 targeting all checkpoints in counties bordering Guinea and Sierra Leone. A structured checklist was used to collect data during interviews with checkpoint personnel.

Results: Forty checkpoints were assessed in seven counties: Bomi (3), Bong (5), Gbarpolu (7), Grand Cape Mount (8), Lofa (13), Margibi (2), Nimba (2). Screening and triaging of incoming travelers was done in all but one county. Isolation and referral facilities were available in 5 (71%) counties. Among materials available for screening and triaging at checkpoints, thermometers were available in 38 (95%), travellers’ registers in 35 (88%), and personal protective equipment in 24 (60%). All checkpoints had hand washing facilities with chlorine, although only 31 (78%) had access to clean safe water. All checkpoints had Ebola Information Education and Communication (IEC) materials displayed. The IEC materials were in English and local language in 30 (75%) checkpoints. There was registration for travelers in 35 (88%) checkpoints. Telephone contact was required in 27 (68%) and destination physical address in 34 (85%) checkpoints. There were unofficial border crossing points across all counties. Safe burial teams were stationed at border areas according to 35 (88%) respondents.

Conclusions: Screening and triaging were still taking place at the time of study. Travellers’ registration should include contacts to enable follow-up of persons and screening established at unofficial crossing points which could be a source of Ebola re-entry into Liberia.





Kateule, Ernest

Country: Zambia

Abstract Title: Mumps Outbreak in an Unimmunized Population of Luanshya District in Copperbelt Province of Zambia, 2015

Biography: Ernest Kateule, PGDip Mgt., BA, has seven years of experience in the health sector as a data manager, researcher, and hospital administrator. Mr. Kateule is a second-year resident in Zambia's first cohort. He is expected to receive a Master of Research from the University of Zambia School of Medicine in August 2016. Mr. Kateule is also a health policy program trainee under Bloomberg Philanthropies' Data for Health Initiative. Prior to his engagement as an FETP resident, Mr. Kateule served as the Senior Hospital Administrator for Roan Antelope General for four years. Mr. Kateule worked as a Data and Health Information Officer for three years. He also served as Assistant Researcher for AfyaMzuri and SHARe International, each for one year.

Abstract

Background: Mumps is a vaccine preventable viral disease which may cause deafness, orchitis, encephalitis or death. However, mumps vaccination is not included in Zambia's Expanded Program for Immunization. In 2014, over 180 mumps cases/month were reported nationally through the Integrated Disease Surveillance and Response (IDSR) system. In January 2015, IDSR data revealed an increase in reported mumps cases in Luanshya District. We investigated to confirm the etiology and generate data on mumps epidemiology in Zambia.

Methods: We conducted active case finding at four health centres, examined possible case patients, and administered a standard questionnaire. A suspected mumps case was defined as acute onset of salivary gland swelling in a Luanshya resident between May–June 2015. Eight case patients provided serum samples to test for mumps-specific immunoglobulin IgM, and buccal swabs to test for mumps viral RNA by RT-PCR, and genotyping of mumps virus at CDC.

Results: From January–June 2015, 272 mumps cases were reported in Luanshya, peaking in April (71 cases) and clustering (81%) in two townships. Of 72 suspected case-patients interviewed, 81% were aged < 15 years (29% 1-4 years) and 61% were female. Clinical characteristics included buccal tenderness (29%) and fever >37.5°C (29%). No patients died, required hospitalization, or developed deafness, orchitis, or encephalitis. Mumps virus genotype D was confirmed in seven case patients by presence of IgM (2), mumps RNA (1), or both (4).

Conclusion: Our findings represent the first reported epidemiologic description of mumps in Zambia, and one of the first reports of circulating mumps genotypes in Africa. While the epidemiology is consistent with prior descriptions of mumps in unimmunized populations, and no serious complications were identified, this report provides local data to inform policy discussions regarding mumps vaccination in Zambia.





Khamis, Asha

Country: Tanzania

Abstract Title: Effect of Rotavirus Vaccine on Childhood Diarrheal Disease in Zanzibar, 2014

Short Biography: Asha U. Khamis earned her MSc in applied epidemiology from Muhimbili University of Health and Allied Science and is currently a Monitoring and Evaluation Officer in the Zanzibar Integrated HIV, TB and Leprosy Control Programme. Her research interests include evaluation on disease surveillance that is informative. Her current work covers a variety of topics in HIV, TB and data quality assessments.

Abstract

Authors: Asha U. Khamis¹, I. Semali², J. Mghamba^{1,3}, Kh. Abeid⁴, R. Kishimba^{1,3}, A. Abade¹

¹Field Epidemiology and Laboratory Training, Tanzania, ²Department of Epidemiology and Biostatistics, Muhimbili University of Health and Allied Sciences, Tanzania, ³Ministry of Health and Social Welfare, Tanzania, ⁴Paediatric ward, Mnazi Mmoja Hospital, Zanzibar

Background: An estimated 25%–50% of global hospitalizations due to diarrhoea among children <5 years occur in sub-Saharan Africa. Immunization against rotavirus reduces the burden of severe diarrhoea in this age group. In 2013, Zanzibar introduced rotavirus vaccine into the routine immunization schedule, administered at 6 and 10 weeks. We describe trends in diarrhoea and rotavirus hospitalizations among children <18 months and the identified risk factors for rotavirus positivity.

Methods: A retrospective review of Zanzibar Mnazi Mmoja Hospital rotavirus surveillance from 2010–2014 was conducted. We determined proportion of children ≤18 months hospitalized with diarrhoea and tested positive for rotavirus yearly. We analysed hospital admission due to diarrhoea and compared the proportion of hospitalizations before and after vaccine introduction. A chi-square test for trend was used to evaluate the significance of the change over time in diarrhoea hospitalizations and positive rotavirus tests. Documented vaccination dates were used to determine the completion of rotavirus vaccination. Multivariate logistic regression was used to determine the risk factors associated with rotavirus infection.

Result: The proportion of children <18 months admitted due to diarrhoea decreased from 85% (1001/1952) in 2010 to 54% (591/1820) in 2014 ($p < 0.001$). Total number of children testing positive for rotavirus decreased from 43% (85/199) in 2010, 40% (76/191) in 2011, and 45% (76/169) in 2012 to 27% (75/283) in 2013 and 23% (59/252) in 2014 ($p < 0.001$). Receiving complete dose of rotavirus vaccine offered protection against rotavirus infection (RR = 0.44, 95% C.I, 0.21 to 0.91).

Conclusion: Total diarrhoea hospitalizations among children ≤18 months decreased significantly after introduction of the rotavirus vaccine. Continued surveillance is recommended to monitor the effectiveness of this expanded immunization schedule.





Khan, Sajjad

Country: Pakistan

Abstract Title: Outbreak of Enteric Fever in Union Council (UC) Tarlai District Islamabad, Pakistan 2015

Short Biography: Dr. Sajjad Ahmad Khan graduated in 1999 from Saratov State Medical University in Russia and completed a PhD in General Medicine (Gastroenterology) in 2006. He later joined the Hepatitis Prevention and Control Program as a senior medical officer. In 2015, Dr. Khan completed a two year FELTP course from FELTP-Pakistan. Dr. Khan worked as a Health Education Officer at the Directorate of Malaria Control Islamabad from 2011–2015 and now has joined the N-Stop Program as N-Stop Officer in Islamabad for the polio eradication initiative.

Abstract

Authors: Ahmed S¹, Hussain Z, Baig MA²

¹National Malaria control program Islamabad Pakistan, ²Field epidemiology and laboratory training program Pakistan

Background: In February, an unusual increase in cases with fever was reported from Tarlai, District Islamabad. A joint FELTP and Health department team was tasked to identify the source and formulate control measures. Tarlai is a rural area of Islamabad, home to families of low and middle socioeconomic strata.

Methods: The general practitioners of the area were visited and then an active case finding was conducted. A case was defined as any resident of Tarlai with fever $>38^{\circ}\text{C}$ and one of the following: headache, abdominal discomfort, anorexia, and positive Typhoid test (IgM) presenting between 20 Jan – 20 Feb 2015. Age and sex matched controls were enrolled from same neighborhood. Descriptive statistics and risk factor analysis was conducted.

Results: A total of 76 cases were identified with mean age of 18.5 years (range 1-70) and the most severely affected age group was 1-14 (n= 32; AR 0.17%). Information on source of drinking water and personal hygiene practices was obtained. Of the 76 cases, 70 consumed green salad washed with transported tanker water (OR 22; 95% CI 8.6 to 59), 60 consumed transported tanker water (OR 17; 95% CI 7.5-37), and 47 had history of contact with a case (OR 5.2; 95% CI 2.6-11). However, multivariate analysis yielded significant association only with consuming transported tanker water (OR 7.7; 95% CI 1.9-32) and consuming green salad washed with transported tanker water (OR 12; CI 3.5 to 40; $p < 0.05$). Due to interruption of regular municipal water supply, transported tanker water became primary source of water.

Conclusion: Consumption of contaminated transported tanker water was the most probable cause of this outbreak. Periodic chlorination of transported tanker water before human consumption was recommended.





Kihembo, Christine

Country: Uganda

Abstract Title: Risk Factors for Podoconiosis in Kamwenge District, Western Uganda

Short Biography: Christine Kihembo is a medical doctor with a Master of International Public Health. She is a 2015 cohort FETP fellow based at the Epidemiology and Surveillance Division (ESD), Ministry of Health, Uganda, where she leads the analysis of national public health surveillance data. Previously, while at the Infectious Diseases Institute, Christine spearheaded the establishment of a capacity building program for Clinicians in East Africa on diseases of international security concern. Dr. Kihembo also has seven years of experience in clinical management and research in HIV/AIDS and related infectious diseases including Kaposi's sarcoma.

Abstract

Authors: Christine Kihembo^{1,2}, Ben Masiira^{1,2}, William Ziras Lari³, Gabriel Matwale⁴, Monica Musenero², Miriam Nanyunja³
¹Uganda Public Health Fellowship Program – Field Epidemiology Track; ²Epidemiology and Surveillance Division, Ministry of Health, Uganda; ³World Health Organization, Uganda Country Office; ⁴Vector Control Division, Ministry of Health, Uganda

Background: Podoconiosis, a form of non-infectious elephantiasis, is a disabling Neglected Tropical Disease. In August 2015, a non-government organization reported an increase in elephantiasis cases in Kamwenge District. We conducted an investigation to confirm the diagnosis and identify risk factors for the illness, so as to guide prevention and control efforts.

Methods: We defined a suspected case person as a Kamwenge resident with bilateral asymmetrical swelling of lower limbs lasting ≥ 1 month, plus ≥ 1 of the following: skin itching, burning sensation, plantar oedema, lymph-ooze, prominent skin markings, rigid toes, mossy papillomata. A probable case was a suspected case with negative microfilaria antigen immunological-card test. We conducted active case finding in the affected communities. In a case-control study we compared shoe use and feet-washing practices among 40 probable case persons and 75 control persons, matched by age, sex and residence village. We collected soil samples to characterize soil-irritant composition.

Results: We identified 52 suspected cases in two affected sub-counties during 1980-2015 (incidence=2.9/100,000/year); 40 were probable cases, whose mean age was 47 (range=13-80) years. No apparent increase in cases has occurred over time. 93% (37/40) of probable case persons and 31% (23/75) of control persons never wore shoes at work (ORM-H=6.7; 95%CI=1.7-26); 80% (32/40) of probable case persons and 55% (39/75) of control persons never wore shoes at home (ORM-H=4.4, 95%CI=1.5-13). 70% (27/39) of probable case persons and 47% (34/72) of control persons washed feet at day-end (vs. immediately after work) (OR=11, 95%CI=2.1-57). Soil samples are characterized as rich black-red volcanic clay in nature.

Conclusion: We verified that the reported elephantiasis was podoconiosis, which was associated with prolonged foot exposure to soil. We recommend health education on foot protection and washing, and provision of protective shoes to Kamwenge residents.





Liu, Yan

Country: China

Abstract Title: Mumps-Containing Vaccine Effectiveness in a Mumps Outbreak in Anhui Province, China, 2014-2015

Short Biography: Dr. Liu Yan, Master of Public Health, is a resident in the 14th cohort of the Chinese Field Epidemiology Training Program. She was Deputy Director of the Immunization Program Department, Hangzhou City's Center for Disease Control and Prevention in Zhejiang province, China. She engaged in the Expanded Program on Immunization and vaccine preventable disease control and prevention. For three months in 2011, she took part in a JICA fellowship project on Vaccine Quality Control Technology in Japan. She currently works in the National Immunization Program as an FETP fellow with China CDC.

Abstract

Background: The Chinese expanded program on immunization has provided one dose of mumps-containing vaccine (MuCV) since 2008. However, mumps incidence has been as high as 25 per 100,000, especially for children. In September 2015, we conducted an outbreak investigation in a primary school located in high mumps prevalence district in Anhui province to evaluate MuCV effectiveness (MuCVE).

Methods: A case was defined as unilateral or bilateral parotid and (or) other salivary gland swelling and pain (≥ 2 days) among students from December 2014 through September 2015. A vaccinated student was defined as a student having MuCV records verified by immunization certificate without clinical symptoms or occurring two weeks after vaccination. We used retrospective cohort method, and compared attack rate (AR) of vaccinated-students with AR of unvaccinated-students to estimate MuCVE and 95% confidence interval [CI]. Students with mumps illness history were excluded.

Results: 97.17% (2303/2370) of students aged 6-13 years were investigated, 114 students had previous mumps history, and 281 students' immunization history were unknown. AR were 17.5% (93/530) among unvaccinated-students compared with 10.6% (123/1165) among 1 dose MuCV students (VE=40%, 95%CI:23%-53%) and 9.9% (21/213) among ≥ 2 dose MuCV students (VE=44%, 95%CI:12%-64%). For one dose MuCV students, VE decayed for those vaccinated within 3 years (VE=63%, 95%CI: 0%-88%), 3-5 years (VE=50%, 95%CI: 26%-66%) and over 5 years (VE=34%, 95%CI: 14%-50%). Moreover, AR were 7.4% (49/ 664) among the students with one dose Measles-Mumps-Rubella combined vaccine (MMR) (VE=58%, 95%CI: 42%-70%), and AR were 14.8% (74/501) among other MuCV (VE=16%, 95%CI: 0%-36%).

Conclusions: MuCVE decayed with time, and VE of MMR was greater than other MuCV. Recommendation of 2-dose MMR vaccination schedule with proper interval is appropriate for China to control mumps.





Medeiros, Eva

Country: Brazil

Abstract Title: First Investigation of Aseptic Peritonitis Outbreak Associated with Peritoneal Dialysis Solution in Rio Grande do Sul State, Brazil, 2015

Short Biography: Eva Medeiros received a Bachelor's degree in nursing from Faculty of TECSOMA Health (2007), post-graduate in public health and occupational health from Faculty of TECSOMA Health (2008). She is currently a trainee of the Brazilian Field Epidemiology Training Program named EpiSUS in Secretariat of Health Surveillance (SVS)/Brazilian Ministry of Health. Her main research interests include public health and epidemiological surveillance.

Abstract

Authors: Eva L. A. Medeiros¹, C. M. Cabral¹, H. N. Siqueira², J. Cardoso³, M. R. de Andrade¹, E. D. Santos¹, E. Saad¹, E.A. Resende¹, J. Percio¹, P. B. Souza¹.

¹Secretariat of Health Surveillance, Ministry of Health, ²National Health Surveillance Agency, Ministry of Health, ³State Secretary of the Rio Grande do Sul Health

Background: Peritonitis is a major cause of Peritoneal Dialysis (PD) discontinuation. In January 2015, after an increase of the number of cases of aseptic peritonitis (AP) among patients on continuous ambulatory PD (CAPD) post-dialysis with the enterprise solution, an investigation was conducted to confirm the outbreak occurrence, describe the event and propose recommendations.

Methods: In a retrospective cohort study from November 1st 2014 to January 31st 2015, exposed were patients who used at least one of the 71 lots prohibited by Brazilian law compared with users of other lots. Ill was defined as patient who had abdominal pain or turbid peritoneal fluid with negative culture in peritoneal fluid and leukocyte count $>100/\mu\text{L}$. Data was collected in medical records and exposed and unexposed were interviewed. Risk difference and risk ratio were calculated.

Results: Among 53 patients in CAPD in 2 dialysis services, 48 were interviewed. Of these, 28 were exposed and 20 unexposed. Among exposed, 13 (46%) were ill. Median age in exposed was 57 (22-75) years and 16 (57%) were male. All confirmed cases used PD solution from Company A. Risk difference to solution of the lot "X" was 67% (RR=5; 95% CI 2.3 to 11) and the lot "Y" was 65% (RR=4; 95% CI 2.1-7.5).

Conclusion: Lots of PD solutions of Company A were associated with the AP outbreak. According the laboratorial results of the Company A, endotoxin was found higher than the standard values established in the Brazilian Pharmacopoeia. No cases were identified after removal of products. Company A received penalties. Dialysis service must control the registration of the received and used solutions by patients and to monitor the rates of peritonitis.





Merweh, Riyadh

Country: Iraq

Abstract Title: Cholera Outbreak in Abugraib District, Baghdad, Iraq, 2015

Short Biography: Dr. Riyadh Merwah, MBChB, was born in Baghdad, Iraq, on December 17, 1957. He completed high school in Baghdad and graduated from the College of Medicine at Mustansiriyah University in 1983. Following graduation, he joined the Iraq army as a military physician. During the Iraq/Iran conflict in the 1980s, he was a war prisoner from 1985-2003. In 2003, he worked in the Iraq Ministry of Health (MOH) as a general practitioner for many primary health care centers. In 2009, he was moved to the Iraq MOH Headquarters to work in the Performance Evaluation department. In early 2014, he was moved to the Quality Assurance Section in the Directorate of Public Health, and then in November 2014 he joined the Iraq FETP (Cohort 5). During his work in FETP he participated in health needs assessments and several outbreak investigations among Internally Displaced People in Iraq. He was also part of the FETP team that investigated cholera, mumps, and cutaneous leishmaniasis outbreaks affecting Baghdad and other provinces in 2015.

Abstract

Background: Iraq is a cholera endemic country with epidemics every 3-4 years. Abugraib district, west of Baghdad, had poor services due to war and influx of internally displaced people. In September 2015, Abugraib, as many other districts in Iraq experienced cholera outbreak. The objective of this study is to describe epidemiological characteristics of the outbreak in Abugraib district, Iraq, 2015.

Methods: Medical records including notification forms, case investigation reports sent from the seven Primary Health Care centers and the local hospital and laboratory reports sent to the health district office were used. Reports of the chlorine levels and biological tests of drinking water specimen were obtained from health inspection unit. Cholera case defined as diarrhea case with a stool specimen tested positive for *Vibrio cholerae*.

Results: The outbreak started on September 14th, the peak was in week 38 and the last case reported in December 5th, 2015. The total suspected cholera cases was 1,815. Mean age was 24 (\pm 19) years. Female constituted 52%. Stool culture was done for 1,152 patients; 336 were positive (29%). Serotyping of cholera was O1 Inaba. Three deaths reported making a case fatality rate of 0.9%. During March-December, 2015, 532 water specimens tested for chlorine level, 316 (59%) failed (<0.5 ppm), and among 86 water specimens tested for biological contamination (presence of E.coli) 25 (29%) were contaminated. Control measures including health education campaigns and provision of chlorine tablets were undertaken.

Conclusion: Abugraib district was one of the most affected districts in Baghdad by the O15 cholera outbreak. Poor quality of supplied water was important risk factor. Provision of adequate and safe water supply besides other control measures should be in place to prevent further outbreaks.





Myroniuk, Mariana

Country: Ukraine

Abstract Title: Return of Polio to Ukraine: Causes and Responses - December 2014

Short Biography:

Mariana Myroniuk graduated from Bukovina State Medical Academy as a medical business major. After graduation, she interned and received a certificate in epidemiology. Since 2002, she has been working for the State Sanitary and Epidemiologic Service of Ukraine. Since 2012, she has been working as Deputy Chief of the State Sanitary and Epidemiologic Service in the Chernivtsi region specializing in the organization and management of healthcare. Mariana is a resident of the seventh cohort of the South Caucasus Training Program of Applied Epidemiology and Laboratory (SC-FELTP, Georgia). During her career, she has taken an active part in international trainings. She has five publications in local and international scientific journals. She regularly lectures on organizational and methodological, theoretical and practical issues of anti-epidemic work and implementation of state sanitary and epidemiological surveillance. She participated in the arrangement of regional workshops on the prevention of communicable and non-communicable diseases, prevention of outbreaks and food poisoning in organized children's groups.

Abstract

Background: In 2015, two cases of acute flaccid paralysis (AFP) were identified through AFP surveillance in the Transcarpathian region, Western Ukraine. On August 28, a WHO Reference Laboratory confirmed a circulating, vaccine-derived poliovirus type 1 (cVDPV1) — the first in Europe since 2010. The aim was to investigate the vaccine-associated polio (VAP) and stop transmission with phased vaccinations.

Methods: Case investigations and retrospective review of immunization records (children one year) from 2009 to 2014 were conducted. Vaccination monitoring and adverse event reporting were implemented. WHO conducted laboratory confirmation and genotyping. Routine environmental sampling tested for circulating poliovirus in wastewater.

Results: On June 30 and July 7, 2015, AFP surveillance identified two AFP cases in neighboring districts (45km apart). The case ages were 4 years and 10 months and neither were vaccinated. The cases recovered with no sequelae. The laboratory identified cVDPV1 with genetic similarities. The viruses had 17 identical mutations. Medical record review revealed that immunization coverage of children one year in Ukraine had decreased by almost half between 2009 and 2014 (81% vs. 45% respectively). In 2014, environmental testing of wastewater identified circulating vaccine strains of polio virus in Ukraine (0.9%). In response, the MoH launched a phased mass oral polio virus (OPV) campaign on October 19 and phase one vaccination coverage of children (2 months to 6 years) was 65%.

Conclusions: Insufficient levels of immunization coverage resulting from decreases over time led to circulating cVDPV1 and paralytic cases. Inadequate vaccine procurement and public distrust contributed to the problem. A phased OPV vaccination campaign was launched to interrupt circulation and AFP surveillance was enhanced. MoH is also strengthening routine immunization.





Patil, Arnol

Country: India

Abstract Title: Outbreak Investigation of Foodborne Illness among Political Rally Attendees-Cuddalore District, a Global Food Infections Network Project Site, Tamil Nadu, India, July 2015

Short Biography: As an Epidemic Intelligence Service (EIS) Officer, Dr. Patil actively monitors disease outbreaks through 24/7 event-based surveillance. He is involved in the National Vector Borne Disease Control Programme, specifically in the areas of malaria and filaria. As a Junior Medical Officer at Navi Mumbai Corporation, India from 2013-14, he provided preventive and curative health services with a special emphasis on maternal and child healthcare, tuberculosis, and noncommunicable diseases. His technical interests lie in infectious disease and non-communicable disease epidemiology, monitoring and evaluation, disease surveillance systems and operational research.

Abstract

Background: Few analytical investigations are conducted for the many foodborne outbreaks in India. On July 24, 2015, many attendees of a political rally were admitted to a hospital for acute diarrhea. Hospital staff notified health authorities and an investigation was conducted to describe the outbreak, identify the source and risk factors, and prevent future outbreaks.

Methods: We defined a case as a resident of Sithalikuppam or Verupachi village who attended the political rally on July 24 and who had ≥ 3 loose stools in 24 hours or vomiting between July 24-26, 2015. We conducted a retrospective cohort study among political rally attendees. We collected stool specimens for culturing enteric pathogens. We also observed food preparation and kitchen sanitation.

Results: Among the 55 attendees from the two villages, we identified 36 cases (attack rate = 65%); 92% had diarrhea and 47% vomited. The median age was 45 years (range = 22 to 80 years). The median incubation time was 12 hours (range = 8 to 20 hours). The attendees ate pickles and homemade lemon-rice, or curd-rice for lunch and dinner. Consumption of lemon-rice for dinner on July 24 was the only item significantly associated with illness (Relative Risk = 4.2; 95% Confidence Interval = 1.7 to 10). Six non-attendees that ate leftover lemon-rice on July 25 became ill (attack rate = 100%). All 10 stool cultures from hospitalized attendees were negative for *Salmonella*, *Shigella*, and *Vibrio* species. Lemon-rice was cooked on the morning of July 24 and stored at ambient temperature (38 to 40°C). No food was available for testing. Food was prepared in unsanitary conditions.

Conclusion: This outbreak was associated with consumption of lemon-rice, likely contaminated by enterotoxin. We recommended that food preparers and handlers be educated on food safety.





Tu, Tran

Country: Vietnam

Abstract Title: Defining Alert Threshold of Dengue Epidemic through Surveillance Program

Short Biography: Mr. Tran Anh Tu is currently an epidemiologist and FETP Fellow working in the Unit of Outbreak Surveillance and Control, National Institute of Hygiene and Epidemiology, Vietnam. His interests are in defining alert thresholds for endemic diseases, supporting risk assessment, and early intervention.

Abstract

Background: Surveillance on dengue fever (DF) in the north of Vietnam has been carried out since 1999, however, the data from this project has not been analyzed for yearly trends. This study aims to define the alert threshold to help identify future outbreaks.

Methods: Data from the Vietnam surveillance database, 1997-2015, was collected and the number of new DF cases per month in the north of Vietnam was calculated and plotted. Three outbreak years had peaks 3-9 times higher than the other years and were eliminated from baseline rate calculations. To create a baseline, the peak month in each year was identified and all years were aligned to the median peak date. The mean and standard deviation (SD) of the aligned data was calculated for each month. An alert threshold was set as the number of cases one SD above the mean.

Results: Data showed a clear trend with the number of cases beginning to increase in July and peaking during October. When the alert threshold was set at one SD, one non-outbreak year exceeded the peak number of cases and two non-outbreak years had an increase in the number of cases earlier than expected. Outbreak years showed an increase in cases 1 to 2 months earlier than the baseline and exceeded the peak by 400% to 900%. Outbreak years occurred every 5 to 6 years.

Conclusions: A baseline and threshold has been defined for DF in northern Vietnam, with a typical increase in cases beginning in July and peaking in October. An increase in DF cases prior to July should serve as a warning of a pending outbreak year. This information allows the identification of an outbreak in its early stages and implementation of early intervention.





ORAL ABSTRACTS

Pande, Gerald

Country: Uganda

Abstract Title: A Point-Source Cholera Outbreak Caused by Drinking Contaminated Water from a Fenced Lakeshore Water-Collection Site –Uganda, June 2015

Short Biography: Mr. Gerald Pande, MPH, is a Cohort 2015 Fellow of the Uganda Public Health Fellowship Program (Uganda FETP – Advanced) with 10 years of experience conducting outbreak investigations, monitoring and evaluation, and applied epidemiologic research. Before joining the fellowship program, Mr. Pande worked as the Assistant District Health Officer at Nakaseke District, where he managed several outbreaks. Since joining the fellowship program, Mr. Pande has participated in five outbreak investigations (including two cholera outbreaks and a typhoid outbreak), evaluated the surveillance system for 12-month retention in care among HIV clients on ART in Uganda, and designed a study to evaluate the current community-based HIV/AIDS service delivery model to reach out to sex workers along a major highway in Uganda.

Authors: Gerald Pande¹, B. Kwesiga¹, G. Bwire², A.R. Ario¹, and B.-P. Zhu³

¹Uganda Public Health Fellowship Program – Field Epidemiology Track, ²Ministry of Health, ³Centers for Disease Control and Prevention

Background: On 20 June 2015, a cholera outbreak affecting 30 people was reported in a fishing village in Kasese District, western Uganda. We investigated this outbreak to identify the transmission mode and recommend control measures.

Methods: We defined a suspected case as a person with onset of acute watery diarrhea from June 2015 onward; a probable case was a suspected case with positive Rapid Diagnostic Test for cholera; a confirmed case was a suspected case with *Vibrio cholerae* cultured from stool. We conducted active case finding in the village. In a case-control study we compared exposure histories of 39 suspected cases and 156 controls matched by age. We also conducted an environmental assessment.

Results: We identified 61 suspected cases (attack rate=5.1%, 61/1200), including 19 probable cases and 8 confirmed cases. The epidemic curve indicated an initial point-source outbreak followed by secondary transmission: after the primary cases onset on 16 June, cases rapidly increased and peaked on 19 June, and rapidly declined afterwards; eight scattered secondary cases occurred after 22 June. 95% (37/39) of cases and 67% (104/156) of controls usually collected water from water-collection Site A ($OR_{M-H}=9.3$; 95%CI=2.1-39). The primary case developed cholera symptoms while fishing, came ashore the night of 16 June, and defecated near Site A. The village's tap water system broke down eight months ago, forcing villagers to collect water from the lake.

Conclusions: This cholera outbreak was caused by drinking lake water collected at Site A, contaminated by the primary case persons feces. At our recommendations, the local authorities rigorously disinfected all case persons feces, provided water treatment tablets, issued a water-boiling advisory, and three weeks later fixed the dysfunctional tap-water system. No cases occurred after July 1.





Konrad, Stephanie

Country: Canada

Abstract Title: Characteristics of a Core Group of Gay, Bisexual and Men Who Have Sex with Men (MSM) with ≥ 4 Infectious Syphilis Infections – British Columbia, 2005 to 2014

Short Biography: Stephanie Konrad is a federal field epidemiologist for the Public Health Agency of Canada, placed at the BC Centre for Disease Control, where she works with the Enterics and Zoonotic portfolio and the STI portfolio. Prior to this she was a communicable disease epidemiologist in British Columbia, Canada. She completed her degree in Community Health and Epidemiology at the University of Saskatchewan. Through her education and professional career, Stephanie has gained experience in STI and HIV surveillance and research.

Abstract

Background: The rate of syphilis has increased in BC, from 6.8 to 12 per 100,000 from 2005 to 2014. Small subpopulations are disproportionately burdened by syphilis. We sought to characterize the socio-demographics, partner notification outcomes, and social network of a core group with ≥ 4 infectious syphilis diagnoses in BC from 2005-2014.

Methods: An STI clinic chart review was conducted for individuals with ≥ 4 syphilis infections between January 1 2005 and December 31, 2014, identified through the provincial STI surveillance database. Descriptive statistics of the age, gender, ethnicity, exposure category, stage of infection, HIV status at diagnoses, number of contacts, and partner notification outcomes was completed along with a social networking analysis (SNA).

Results: Between 2005-2014, there were 30 individuals with ≥ 4 syphilis diagnoses, accounting for 139 diagnoses. All were MSM, 24 (80%) self-reported as Caucasian, and 29 (96%) were HIV positive at their last syphilis diagnosis (1 of the 29 seroconverted during the study period). The mean age was 41 (SD: 7.4) and 47 (SD: 7.5) at earliest and last diagnosis. Partner notification details were available for 111 of the 139 diagnoses. Overall, 838 contacts were reported, of which 79% were deemed notifiable, 53% notified and 23% reported to have been tested and/or treated. Mean number of sexual contacts per diagnosis was 7.6 (median= 5, range=1 to 50). SNA identified that over the ten years, 14 members of this core group were linked directly or indirectly through contacts to each other.

Conclusion: Routine syphilis testing among HIV patients and high-risk behaviors may account for the multiple syphilis diagnoses. Strategies to protect against syphilis infection, like daily prophylaxis, may benefit individuals in this core group.





Nayal, Priyakanta

Country: India

Abstract Title: Outbreak Investigation of Cutaneous Anthrax in Koraput, Odisha — India 2015

Short Biography: Dr. Priyakanta Nayak is an India Epidemic Intelligence Service (EIS) Officer who has currently been involved in actively monitoring disease outbreaks through 24/7 event-based surveillance. Dr. Nayak's prior public health work experience largely related to chronic communicable disease control, as he did substantial work in providing programmatic assistance to the government for TB and HIV control (2008–2014). Dr. Nayak was a medical consultant for the World Health Organization (WHO) on the National Tuberculosis Control Program in India (2011–2014), and he provided technical support to the Department of AIDS Control, India, National Technical Support Unit (NTSU), India (2010–2011). From 2009–2010 he taught public health and epidemiology in a medical college. His interests lie in developing capacities in public health through health systems strengthening and workforce development. His technical interests include infectious disease epidemiology, monitoring and evaluation, disease surveillance systems and operational research.

Abstract

Background: Anthrax is associated with exposure to infected animals or animal products and has a case fatality rate of up to 20% if untreated. During May – June 2015, an outbreak of cutaneous anthrax was reported in Koraput district of Odisha, India, a known endemic area for anthrax. We investigated the outbreak to identify risk factors and recommend control measures.

Method: We defined an anthrax case as skin lesions (*e.g.*, papule, vesicle or eschar) in a person residing in Koraput with illness onset between May 1 and June 30, 2015. We established active surveillance through a house-to-house survey to ascertain additional cases and conducted a 1:2 unmatched case-control study to assess risk factors. We defined controls as neighborhood contacts of case without skin lesions. Ulcer exudates and rolled over swab from wounds were processed in Gram's stain in the Koraput district hospital laboratory.

Result: We identified 81 cases (89% male; median age 38 years [range 5-75 years]) including 3 deaths (case fatality rate = 4%). Compared to controls, being a case was associated with burying a dead animal (OR: 92, 95 % CI: 11 to 760), butchering (OR: 342, 95 % CI: 41 to 1900), de-skinning (OR: 58, 95 % CI: 7.3 to 460), and chopping animal meat and bone (OR: 52, 95 % CI: 6.6–415). Among 20 wound specimens collected, seven showed spore-forming, non-motile, gram positive bacilli, with bamboo stick appearance suggestive of *Bacillus anthracis*.

Conclusion: Our investigation revealed strong epidemiological associations with handling of dead animals and presence of anthrax-like organisms in lesions. We immediately initiated livestock vaccination in the area, educated the community on safe handling practices, and recommend continued regular anthrax vaccination to prevent future outbreaks.





Kilasi, Shabi

Country: Tanzania

Abstract Title: Factors Influencing Utilization of Cervical Cancer Screening among HIV-infected Women in Mbeya, Tanzania, 2014

Short Biography: Mr. Shaba Michael Kilasi was a Field Epidemiologist for the Mbeya Regional Health Management Team as part of the Tanzania Field Epidemiology and Laboratory Training program and the Muhimbili University of Health and Allied Sciences. From 2008–2013, he was the head of pre-service training for the southern-west Zonal Health Resource Centre. He later went on to work on an evaluation of the palliative care data collection cascade at the Ocean Road Cancer Institute-(ORCI), a project related to the demographic characteristics of women who attended ORCI Dar Es Salaam for Cervical Cancer Screening, and a project analyzing the factors influencing utilization of cervical cancer screening among HIV positive women in Tanzania. In addition, Mr. Kilasi was involved in curriculum development for community health workers and a project titled Awareness and Knowledge of Structural Birth Defects among Women Attending Reproductive and Child Health Clinics in Coast Region, Tanzania.

Abstract

Authors: Shaba Kilasi ¹, C. Moshiro², A. Abade, ¹, RS. Kishimba ^{1,3} and U.Lovenes ¹

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BACKGROUND: Cervical cancer represents 7.5% of all female cancer deaths and is highly prevalent in lower-resource countries in Sub-Saharan Africa. HIV-infected women are five times more likely to be diagnosed with cervical cancer than uninfected women; annual screening for this group is recommended. In Tanzania, cervical cancer screening services are free and are available at all health facilities. We determined factors influencing utilization of cervical cancer screening among HIV-infected women.

METHODS: We conducted a cross-sectional study of HIV-infected women attending care and treatment centers (CTC) in Mbeya, Tanzania. Respondents were identified using systematic random sampling from a daily register and contacted at the completion of their visit. We used questionnaires to collect information on factors influencing utilization of services. A multivariate logistic regression model was used to determine independent predictors for acceptance of cervical cancer screening.

RESULTS: Of the 345 respondents completing questionnaires, 333 (97%) were aware of cervical cancer screening and 147 (43%) had been screened. Of those not screened, 190 (96%) were willing to be screened. Reasons for not being screened among those aware of the screening service included fear of the results (19%), not being aware of where to access services (34%), services being expensive (33%), and not having time to attend screening (31%). In a multivariate logistic regression model, perceived increased risk of cervical cancer (AOR: 2.8; 95% CI: 1.8 to 4.4) and having a higher number of children (AOR: 1.5; 95% CI: 1.03-2.0) significantly increased the odds of accepting screening services.

CONCLUSION: HIV-infected women attending CTC in Mbeya, Tanzania were aware of cervical cancer screening opportunities. Educational messages that address fear, screening sites, and the free nature of screening might improve uptake.





Haussig, Joana

Country: Germany

Abstract Title: People Who Inject Drugs are Often Not Vaccinated Against Hepatitis B Despite Recommendations: Results from the First Large Integrated Sero-behavioral Study in Eight German cities, 2011-2015

Short Biography: After my studies in biology at the Ruprecht-Karls University Heidelberg, Germany, I worked at the Max Planck Institute for Infection Biology, Berlin, as a PhD student and post-doc in malaria research with a focus on the characterization of *Plasmodium berghei* apicoplast proteins. Currently I am a German FETP (PAE) fellow assigned to the unit of HIV/AIDS, STI and Blood-borne Infections at the Robert Koch Institute in Berlin, Germany.

Abstract

Background: The German Standing Committee on Vaccination recommends vaccinating people who inject drugs (PWID) against hepatitis B (HBV). PWID are frequently incarcerated, which constitutes another indication for HBV vaccination. To investigate factors influencing HBV-vaccination status (HBV-VS) among PWID, we analyzed data from a multicenter sero-behavioral survey in eight cities.

Methods: Current drug injectors aged ≥ 16 years in the eight cities were recruited by respondent-driven sampling in low-threshold drug services from 2011 to 2014. Capillary blood samples (dried blood spots) were tested for HBV-DNA, HBsAg, anti-HBc and anti-HBs. Participants exclusively positive for anti-HBs were defined as HBV-vaccinated. Face-to-face-interviews included questions on HBV infection, vaccinations, and socio-demographic factors. We excluded HBV-infected participants and used univariable and multivariable logistic regression to calculate adjusted odds ratios (aOR) to identify factors associated with not being HBV-vaccinated.

Results: Among 2,077 participants, 32% were HBV-vaccinated (range: 15% to 52%). In 43% (16% to 69%), no HBV markers were detected. Knowledge of own HBV-VS was incorrect in 47% (41 to 57%). Opioid substitution therapy and incarceration were significantly associated with not being HBV-vaccinated in univariable analysis, but not multivariable analysis. PWID without anti-HBs were more likely to be in age-group 25-39 years (aOR: 1.6, 95% CI: 1.0 to 2.6) (reference: <25 years), have a higher education level (aOR: 2.8, 95% CI: 1.0 to 2.6) and to consume drugs in Berlin (aOR: 16, 95%-CI: 10 to 26) and Leipzig (aOR: 13, 95% CI: 7.1 to 25) (reference: Hanover).

Conclusion: Many PWID are not vaccinated against HBV and are at risk of HBV infection. Poor knowledge of HBV-VS indicates general lack of knowledge on HBV. The local setting seems to have the greatest influence on the HBV-VS. Our results emphasize the need for targeted information and vaccination campaigns during incarceration or opioid substitution therapy.





Kikvidze, Tamar

Country: Georgia

Abstract Title: Knowledge, Attitude and Practices on Vaccination and Measles in Adjara Region of Georgia, 2014

Short Biography: In 2001, Dr. Tamar Kikvidze graduated from the Highest Medical School “Ayeti” and continued in the residency program in internal medicine at the Tbilisi State Medical University. Upon completing the program she was awarded an MD degree. In 2008, Dr. Kikvidze was admitted to the International School of Public Health at the Tbilisi State University (ISPH/TSU). There she participated in the exchange program between the ISPH/TSU and School of Public Health at the University of Albany (UA). Dr. Kikvidze focused her studies around risk factors associated with persistence for Hepatitis B virus infection and graduated from ISPH/TSU with a Master of Public Health degree. From 2013–2015, Dr. Kikvidze worked at the National Center for Disease Control and Public Health Communicable Diseases Department as an epidemiologist. At present, she is working at the Médecins du Monde representation in Georgia as a medical coordinator for peer-support intervention on the outcomes of hepatitis C treatment in People Who Inject Drugs (PWIDs). She is continuing her studies as a CDC South Caucasus Field Epidemiology and Laboratory Training Program (FELTP) resident.

Abstract

Background: In 2013-2014, Georgia experienced a large-scale measles outbreak (11,000 cases) likely caused by suboptimal population immunity. The public’s knowledge and attitudes towards immunizations are important determinants of demand for vaccines. We assessed knowledge, attitude, and practices (KAP) on immunization and measles in the Adjara region.

Methods: In June 2014 we conducted a cross-sectional survey using cluster sampling. Information on respondent’s demographics and their KAP about immunization and measles was collected using an interviewer-administered questionnaire to women aged 18-50 years.

Results: Of the 560 women (median age, 34 years) interviewed, 498 (89%) were married, 486 (87%) had children, 320 (57%) were housewives, and 186 (33%) had university education. Five hundred ninety-eight (98%) respondents believed they knew what vaccination is, 524 (94%) agreed that immunization is effective for preventing measles, 530 (95%) agreed that immunization often causes mild adverse events, and 308 (55%) believed immunization often causes major adverse effects. One hundred eighty-seven (33%) respondents believed that it’s better to get natural disease than vaccination; healthcare workers were less likely to believe that than non-healthcare workers (RR=0.6; 95% CI: 0.4-1.0). Two hundred forty-three (44%) respondents knew measles transmission is airborne, and 105 (19%) believed it is transmitted by fomites; 485 (87%) named rash as a measles symptom, but 398 (71%) could not name its complications. Four hundred eighteen (75%) women reported receiving measles vaccine and 436 (90%) women with children had their children vaccinated for measles.

Conclusions: Despite overall positive attitude and practices towards immunization in Adjara, there were substantial gaps in knowledge about risks of measles and vaccinations which could result in vaccine hesitancy. To increase demand for vaccination and help control the current measles outbreak, interventions to improve population understanding of risks and benefits of immunizations are needed.





THANK YOU

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International Night is hosted by the Centers for Disease Control and Prevention, Field Epidemiology Training Program Branch within the Division of Global Health Protection (DGHP) and the Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET).

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