

North Carolina Occupational Health Surveillance Program  
Annual Report of Accomplishments and Impacts – Year One  
July 1, 2015 – June 30, 2016

## Major Accomplishments and Outputs

The goal of the North Carolina (NC) Occupational Health Surveillance Fundamental – Plus Program (OHSP) is to enhance North Carolina’s capabilities to characterize occupational risks to health in greater detail, focusing on state-identified priorities (e.g. vulnerable worker groups or outstanding occupational health risks), and use what is learned to develop and inform prevention strategies with the help of partners. Outcomes resulting from these efforts contribute to decreasing the health risks of occupational injuries and illnesses to North Carolinians. Outputs and outcomes are listed below by the OHSP’s three aims, as recommended by the *Guidelines for Minimum and Comprehensive State-Based Public Health Activities in Occupational Safety and Health*. The NC OHSP operates from within the Occupational and Environmental Epidemiology Branch (OEEB) of the NC Department of Health and Human Services, Division of Public Health.

***Aim 1. Assessment of occupational injuries, illnesses and vulnerable worker groups through the collection, analysis and reporting of occupational surveillance data.***

### OCCUPATIONAL HEALTH INDICATORS (OHI)

The OHSP collects occupational health indicator (OHI) data from existing state and national data sources that measure health effects, exposures, hazards, interventions, and socioeconomic impact related to occupational injuries and illnesses that are of public health importance. Part of this effort included collaborating with the Southeastern States Occupational Network (SouthON) to design methods for, and collect data for a state-added OHI for occupational heat-related illness. This OHI was added to the core set of recommended indicators for occupational health surveillance in March, 2016 as Indicator #24: “Occupational Heat-Related Emergency Department (ED) Visits”. In August, 2015, OHSP used this data to publish a report describing work-related heat illness trends in North Carolina from 2007 through 2011 using hospital discharge and ED visit data. Results were provided to stakeholders, posted to the OEEB website, and provided to the NC Climate-Related Health Advisory Group of the North Carolina Building Resilience Against Climate Effects (BRACE) program. OHSP will continue annual surveillance of occupational HRI as a state-added indicator, and as a part of its routine annual collection and distribution of OHI data findings.

During Year One, 21 of the 24 OHI for 2013 data, including Indicator #24, were compiled and submitted in June, 2016 by OHSP to the National Institute for Occupational Safety and Health (NIOSH) for quality checks, and the Council of State and Territorial Epidemiologists (CSTE) for publication on their website. A one-page data issue brief was drafted featuring 14 of the 24 OHI for 2013 data. Additionally, OHSP collaborated with the University of North Carolina (UNC) at Chapel Hill, Gillings School of Global Public Health, to compile missing NC OHI data for years 2004 through 2007 with the help of a UNC graduate-level public health student intern. These data were also submitted to NIOSH and CSTE in June, 2016.

### EXPOSURE CASE SURVEILLANCE – ELEVATED BLOOD LEAD LEVELS IN ADULTS AND ACUTE PESTICIDE-RELATED INJURIES & ILLNESSES

In October, 2015, the OHSP hired data processing staff to perform elevated blood lead level (EBLL) in adults case surveillance data entry and follow-back investigations with the NC Lead Program. The data processor completed the backlog of un-entered case data accumulated since September, 2013 (when funding for EBLL case surveillance was discontinued), processed all EBLL case data for year 2014 for submission to NIOSH in 2016, and is currently imputing data for EBLL cases  $\geq 10$   $\mu\text{g/dL}$ . Case follow-back activities involved contacting health clinics for missing information, mailing exposure prevention information to

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cases with EBLL  $\geq 10$   $\mu\text{g}/\text{dL}$ , and attempting interviews with, and referrals of cases of EBLL  $\geq 40$   $\mu\text{g}/\text{dL}$  to OEEB industrial hygienists (IH) for consultation.

The OHSP also hired a bilingual program consultant to assist with occupational acute pesticide-related injury and illness case surveillance and follow-back activities, which included case data entry, contacting poison centers and clinics for medical record information, and coordinating exposure investigations with the NC Department of Agriculture & Consumer Services. The program consultant was also responsible for developing relationships between the OHSP and farm-worker advocacy groups, increasing the number of reported pesticide illness cases by 10%, and increasing the rate of successful follow-back interviews by 65% by the end of the five-year program funding cycle (mid-2015 through mid-2020).

#### ADDITIONAL DATA SOURCES TO EXPLORE TRENDS AND EMERGING ISSUES IN STATE OCCUPATIONAL HEALTH

Previous work by the OHSP suggested the need to describe injuries related to workers in the agricultural industry sector, and disparities associated with fatal work-related injury rates by race and ethnicity in greater detail. OHSP identified fatal work-related injuries in the agricultural industry sector, and occupational health disparities as priorities for further investigation in Year One. To characterize injuries in the agricultural industry sector, the OHSP collaborated with the NC Agromedicine Institute and East Carolina University (ECU) on a project to describe farming-related accidental injury fatalities in NC from 2009 through 2013, using death certificate data from the NC State Center for Health Statistics and the Office of the Chief Medical Examiner. To characterize occupational health disparities, the OHSP used US Census Current Population Survey employment data, and Bureau of Labor Statistics Census of Fatal Occupational Injuries data to describe occupational health disparities by race/ethnicity, industry, occupation, and income in NC during 2013, and how these disparities may have contributed to work-related fatalities over an 11-year period (2003 through 2013). Results for farming-related accidental fatal injuries were published as an ECU student's thesis report that was distributed to stakeholders. Result for characterizing occupational health disparities were published as a report on the OEEB website, distributed to stakeholders, and presented at the CSTE Annual Meeting in Anchorage, AK in June, 2016. Occupational health disparities remain a priority for the NC OHSP, and additional projects to address this issue are ongoing in subsequent years of the five-year project funding period.

***Aim 2. Promotion of occupational health policy and programs through the development of partnerships.***

The OHSP hosted its biannual Occupational Surveillance Advisory Group Meetings in November, 2015, and May, 2016. The program outlined and prioritized its projects and deliverables for the five-year funding period, voted on priorities for Years One and Two, and solicited collaboration on projects from Advisory Group members. Advisory Group members from UNC, ECU, and the Safety and Health Council of North Carolina have agreed to collaborate on projects involving assessment of occupational health disparities by providing technical expertise and student interns. Surveillance priorities for Year Two would include surveillance of NC Trauma registry data for transportation-related traumatic occupational injuries, and establishing a workgroup to sample and interview subjects representing vulnerable worker populations. These groups will be interviewed to collect detailed data on occupational injury risks and worker knowledge, attitudes, and practices related to risks of occupational injury and illness; information not provided in existing OHI data sources.

OHSP is also collaborating with OEEB in an effort to establish occupational carbon monoxide (CO) poisoning as a mandatory state reportable condition. This rule change to

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existing mandatory public health reporting laws would increase surveillance capacity, enabling OEEB to more effectively address the public health burden of CO poisoning in the workplace. OHSP assisted OEEB staff in this effort by providing data and technical expertise to help develop a case definition for work-related CO poisoning incidents.

***Aim 3. Assure protection of the workforce through intervention and prevention strategies.***

A crucial part of state surveillance is to use data analysis results to inform and design preventive interventions focused on identified priority risks to workers' health and safety. OHSP has performed outreach and interventions focused on carbon monoxide (CO) poisoning and elevated blood lead levels in adults during Year One.

#### CARBON MONOXIDE POISONING PREVENTION

OHSP collaborated with OEEB to design and distribute informational factsheets providing tips to help fire response personnel avoid carbon monoxide exposure injury while on the job. This information was provided to the Charlotte-Mecklenburg Emergency Management Office and showcased at the Office's Regional Response Hazmat Team Advisory Committee meeting in April, 2016.

#### EBLL IN ADULTS CASE FOLLOW-BACK INVESTIGATIONS AND OUTREACH

Beginning in 2016, all cases of workers in North Carolina reported to OEEB with EBLL  $\geq 10$   $\mu\text{g}/\text{dL}$  received annual mailings containing information about their BLL test results, how to get additional testing, and tips on how to decrease their exposures to lead. Mailing information was available in English and in Spanish, and also included information specifically for pregnant women and women of child-bearing age. Additionally, the OEEB occupational health nurse (OHN) and IH performed consultation and site visit services in-kind for OHSP to conduct follow-back investigations for cases of elevated, and persistently high BLLs in adults (BLL  $\geq 40$   $\mu\text{g}/\text{dL}$ ). For two follow-back investigations, workers and citizens with EBLL  $\geq 40$   $\mu\text{g}/\text{dL}$  were interviewed by OEEB staff to obtain information that can be used to decrease lead exposures at their homes and places of employment. Employers of these workers also received calls and site visits or referrals to OSHA (when necessary) from OEEB IH staff to: discuss potential sources of occupational lead exposure, review the employers' OSHA regulation-based exposure control programs, and attempt to resolve hazardous lead exposure issues.

One follow-back investigation in 2015, currently an ongoing investigation, involved cases of take-home lead exposure to the children of workers at two lead processing facilities. OHSP collaborated with OEEB; the NC DPH Children's Environmental Health Unit, Environmental Health Section; representatives from both worksites; and the local county health department to characterize the levels of exposures for workers at the two worksites and the workers' children, as compared to the overall lead exposure rates throughout the state. Exposed workers and their families were identified and notified, contact with exposed workers and their families was established, and OHSP and OEEB personnel met with representatives from both worksites to conduct site visits, provide education, and discuss and assist in developing lead exposure reductions strategies. Recommendations highlighting the importance of blood lead testing, especially for children less than six years old and among pregnant women, were provided by NC DPH to the worksite employees and household members of current employees. Information was also distributed by NC DPH that the worksite employees and their household members can share with their healthcare providers explaining the circumstances of the blood lead testing recommendations.

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**Publications/Presentations/Reports**

- Gwyn A. Incidence and Characteristics of Farming Related Accidental Injury Fatalities in North Carolina, 2009 to 2013. East Carolina University. (Student Thesis)
- Dang GTT. 2015. *Occupational Heat-Related Illness in North Carolina, 2007-2011*. Occupational & Environmental Epidemiology Facts & Figures, North Carolina Division of Public Health. (Report)
- Dang GTT. *Assessment of Occupational Health Disparities in North Carolina, 2013, and Eleven-Year Trend (2003-2013)*. Occupational & Environmental Epidemiology Facts & Figures, North Carolina Division of Public Health. (Report)
- Dang GTT. *Describing Occupational Health Disparities in North Carolina, 2003-2013*. 2016 CSTE Annual Conference, Council of State and Territorial Epidemiologists, Anchorage, AK, 19-23 June. (Abstract)

**Contact Information**

Gregory Dang, DrPH  
Principal Investigator  
Occupational Health Surveillance Program  
Division of Public Health  
NC Department of Health and Human Services  
(919) 707-5904  
[gregory.dang@dhhs.nc.gov](mailto:gregory.dang@dhhs.nc.gov)