

Background Description and Learning Experience

The Office of Environmental Health (OEH) within the Arizona Department of Health Services (ADHS) was interested in participating in this fellowship, because it is a great opportunity to advance current knowledge and skills in environmental public health tracking and to enhance the capacity to conduct related activities.

ADHS has tracked conditions and diseases that potentially have a relationship to environmental hazards and exposures such as birth defects, asthma, cancer and other chronic diseases. With the support from the Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR), OEH has conducted activities in collecting exposure information for child and adult lead poisoning, pesticide poisoning as well as behavioral risk factors. OEH also evaluates environmental hazard data to determine potential health risks associated with site-specific exposures. However, ADHS has not had the capacity to link health outcome data, exposure data, and/or environmental data.

Host State Site Visit – February 22nd & 23rd, 2011

ADHS visited California's EPHT Program in February, 2011. ADHS spent 1½ days in California with host state staff. Arizona was matched to California because of the mutual interest in heat related mortality and morbidity.

ADHS is extremely grateful to California's EPHT Program for their hospitality as well as their willingness to take time to share their knowledge and expertise with ADHS staff. The site visit was another invaluable piece to this fellowship program to help Arizona understand the NEPHT Network in greater detail. ADHS and CEPHT exchanged information and ideas that helped ADHS to develop methods and approaches to evaluate health related mortality and morbidity in Arizona.

National Environmental Public Health Tracking Conference – April 2011

Arizona participated in the workshop in New York City to learn about the work other states are doing in regards to Environmental Public Health Tracking. Plenary Session topics included: News and Updates; Results from Five Years of Tracking; Academic Partners of Excellence; A look into Health and Mapping; CDC National Portal Preview; Health Impacts Assessment; Biomonitoring Initiatives; and National Weather Service. In addition to the plenary sessions, ADHS participated in several concurrent or breakout sessions: Content Working Groups (CWG) – Air, Lead, and Vital Statistics as well as the Climate breakout session.

Learning Experience:

ADHS found that participation in the workshop was an invaluable experience to learn from the CDC, partners (like ASTHO), and other states. The workshop covered successes, lessons learned and more challenges that still need to be worked out. The Network is a work in progress, and it was exciting to see how each partner has tackled various aspects to build the National Environmental Public Health Tracking Network into what it is today. Each person brought a unique perspective, and the workshop was a media where experts could collaborate and find solutions to enhance the network.

Pilot Project

Abstract

ADHS has identified a data gap in understanding the scope, trends, and risk factors of heat related morbidity in Arizona. Until now, significant attention has been placed on surveillance of heat related deaths in Arizona. Linking health outcome and environmental data, will allow us to better understand the elements surrounding heat related mortality and morbidity and to identify risk factors and targets of intervention.

Goals of the pilot project were to 1) gain an in-depth understanding in the key tracking techniques and IT infrastructure. In addition, with this opportunity, 2) build peer networks and be a part of the national tracking conversation to enhance our capacity to integrating environmental and epidemiological data and 3) to identify ways to improve public health with better information.

Specific Aims

Heat related mortality surveillance in Maricopa County, Arizona has been strong. However, only limited efforts are used to address the heat-related illnesses. Hence, OEH plans to identify local at-risk

populations, and characterize all-cause and cause-specific excess mobility/mortality in Maricopa County, Arizona. This will be completed by looking at hospital discharge data on and following excessive heat events to determine which factors significantly influence rates of heat related illness.

Benefits and significance to the state of Arizona and EPHTN

Rising average annual temperatures, the urban heat island effects, and limited vegetation amplify the impact of the heat on the population in this area. According to Maricopa County's 2008 Annual Report, annual heat-related and heat-caused deaths in Maricopa County have increased from 2001 to 2008, with peak years being in 2005 and 2006 (80 and 85 deaths respectively). In July 2005, a single heat wave caused 28 deaths in Maricopa County alone, which represented an excess heat-related mortality of 102% in comparison with the corresponding periods from 2000 to 2004 (Yip et al. 2008).

After the 2005 incident, the ADHS developed a Heat Emergency Response Plan to improve the response to heat event emergencies. ADHS has put efforts to anticipate and prepare for the effects of climate change to reduce the associated health burden which requires systemic ongoing efforts to identify and reduce risks of heat. This cannot be done without an effective public health tracking system in place.

Methods and Strategy

As part of this pilot project, ADHS reviewed available databases, identified useful fields/information, explored barriers and issues, and began to link databases. After talking to ASTHO, Maricopa County, and California and data owners at ADHS, Arizona learned of many barriers to using hospital discharge data. (1) The hospital discharge database is not nearly as "clean" as the death certificates database. (2) Heat illness is believed to be under-reported for a variety of reasons. (3) There is no universal method for determining heat illnesses using hospital discharge data. (4) "Excess morbidity and mortality associated with heat waves go beyond that classified formally as 'heat related.'"(Knowlton et al.) Arizona did learn of several methods to attempt to overcome these barriers. (1) Look at total hospital admissions on high heat days. (2) Look at codes for illnesses that are known to be affected by heat.

ADHS has pulled all heat related or heat caused deaths in Arizona from 2005 to 2010 using ICD-10 codes X30, T67, and T67.0, and is waiting on the requested weather data from the National Weather Service. ADHS will link weather data corresponding to the city where the death or illness occurred to the death or illness record, respectively. Weather data will include high temperature, low temperature, diurnal temperature, issuance of high heat alerts/warnings, precipitation, humidity, heat index, ozone, and particulate matter. Obtaining the weather data is delayed, because some of the cities with deaths do not have weather stations to record all of the above desired information. The National Weather Service is using a model to provide an estimate to ADHS for cities that do not collect the requested data.

Conclusion and Next Steps

Currently, the existing environmental hazard, exposure and disease tracking systems in Arizona are not linked together, thus it is difficult to study and monitor relationship among hazards, exposures, and health effects. Through this fellowship program, ADHS staff was able to gain first-hand experience from other states to explore our ways to develop a system that link environmental and human health data and integrate into the national tracking network. The ADHS fellow built partnerships with other states. The trained fellow will be the lead in conducting environmental health tracking activities for our agency.

At the end of the project, ADHS was able to identify data gaps and increase understanding of the environmental public health tracking systems. Through the information gathered from the literature review, conversations with Maricopa County and California Department of Public Health, ADHS has a better understanding of implementing a tracking system for heat related mortality and morbidity.