Substance Abuse, Injury
Wisconsin Department of Health Services, Division of Public Health, Bureau of Community Health Promotion, Family Health Section
Madison, Wisconsin

Assignment Description

The Injury and Violence Prevention program is located in the Bureau of Community Health Promotion (BCHP) in the Wisconsin Division of Public Health (DPH). The Bureau consists of cross-cutting and integrated programs throughout the lifespan: maternal and child health (MCH), including birth defects surveillance, PRAMS, reproductive health, genetics, universal newborn blood, point of care, hearing and CCHD screening, children and youth with special health care needs (CYSHCN); physical activity and nutrition (including WIC); oral health; and chronic disease (tobacco prevention and control, diabetes, heart disease and stroke, cancer control, and the Well-Woman program). The Fellow will have many important roles and opportunities and can receive close mentorship by a senior injury prevention epidemiologist working with the secondary mentor on data access, analysis and technical approaches to program data and surveillance needs.

It is noted that injury and violence is one of the most important but also one of the more overshadowed areas of public health. However, when one breaks down major disease categories by years of life lost, in its various components, injury accounts for the leading cause of Potential Years of Life Lost. More than cancer, more than heart disease, diabetes and more than AIDS.

While focused on injury and drug overdose issues, the CSTE fellow will also have exposure to other areas of epidemiology, program evaluation, and disease surveillance in BCHP, which has more than 10 epidemiologists specializing in various areas of chronic disease and MCH. These individuals, along with students from the University of Wisconsin School of Medicine and Public Health (UWMSPH) and a number of fellows and trainees, make up an interactive learning community that contributes to internal and external public health workforce development.

Day-to-Day Activities

- Participate in the following meetings: Injury and violence prevention program meetings (weekly) DPH Epidemiology/Data Working Group meetings (monthly); Family Health Section meetings (monthly); BCHP-wide meetings (2x/yr); Prescription Drug Overdose Prevention Program monthly meetings, Integration meetings (6-10x/yr); Preparedness meetings and trainings (as appropriate)
- Attend weekly progress meeting with mentors (2-4 hr/wk as specified, minimum)
- Attend and make at least 1 presentation in learning sessions with other learners at DPH (medicine, nursing, nutrition, epidemiology, and MPH students and fellows)
- Attend weekly public health seminars at UWSMPH as applicable
• Working with the mentors, choose one or more epidemiologic surveillance or program evaluation projects and follow it/them from development to investigation to data collection to analysis to report or manuscript completion
• Become comfortable with database linkage, GIS mapping, and evidence-based public health as relevant to the particular project(s) chosen

Potential Projects

EXAMINE POTENTIAL BENEFITS OF FIELD INVESTIGATION OF HOSPITAL OR EMERGENCY DEPARTMENT VISITS FOR ACUTE DRUG POISONING ("OVERDOSE")

State and local health departments do not normally investigate individual cases of acute drug poisoning or overdoses. The main diseases that trigger field studies are infectious conditions in which contacts of the index case are traced to detect or prevent person-to-person transmission of disease. However, while many disease outbreaks are infectious, some are not, e.g., birth defect and cancer clusters. Key steps and reasons for conducting outbreak investigations are available in two standard sources, Field Epidemiology and Applied Epidemiology: Theory to Practice. A chapter on the state and local health department perspective in Field Epidemiology was written by Wisconsin's state epidemiologist, Jeff Davis.

As drug poisoning is a new program area at DPH with limited staff, there is a lack of an established protocol in what steps to take when a suspected acute drug poisoning outbreak occurs. There is no current expectation or requirement that county coroners, medical examiners, or health officers report such outbreaks to the state or local health department or do so in a standardized manner. Therefore, the purpose of this project would be for the CSTE Fellow to explore the pros and cons of creating a protocol to guide follow up on acute drug poisonings that meet a specified case definition. In addition to speaking with some state and local health department staff in Wisconsin, the Fellow would find, collect, and review relevant, drug poisoning-related journal articles and inquire about relevant protocols and practices in other states. Some of the responses to a recent opioid epidemic web survey of local health departments in Wisconsin may also inform the design and implementation of this project.

Some of the possible reasons to field investigate nonfatal or fatal drug poisoning cases, either individually or in clusters, may include: (a) treating the sick person, (b) detecting new drugs or drug adulterants not seen before in the state (c) modifying environment by restricting or controlling drug contaminants, (d) modifying behavior to reduce risks to self or others, (e) disseminating and administering post-exposure prophylaxis, and (e) issuing press releases, health alerts, and other information regarding risk reduction.
EXAMINE AMBULANCE RUN DATA TO EVALUATE ITS USE FOR COUNTING OVERDOSES, DESCRIBING, AND EVALUATING NALOXONE AVAILABILITY AND USE

Using ambulance run data to identify suspected opioid overdose has important implications for surveillance and prevention (see Knowlton A. Prehosp Emerg Care. 2013 Jul-Sep;17(3):317-29). The objective would be to explore the utility of EMS data on naloxone administration for estimating opioid overdose incidence.

Example, questions proposed for an evaluation of the Wisconsin Ambulance Run Data System (WARDS) data regarding overdoses and availability, use, and effects of naloxone include:

1. How many doses of naloxone are given each year during past 10 yrs? How many patients receive more than one dose per visit? How many unique patients receive each of: one, two, three, four, etc., ambulance runs with naloxone administration per year?
2. How many patients had already received naloxone before the EMS personnel arrived on scene? Who administered it: police, friend, relative, other, or unknown?
3. Summarize data on naloxone administrations by these items (taken from the WARDS data definitions list): Type of location of incident, Insurance type, Pre-existing condition of substance abuse, Cause of injury, Incident disposition, Route of naloxone administration.
4. Summarize socioeconomic characteristics such as age, sex, type of insurance, county of residence, etc.
5. How does the distribution of naloxone each of the past 10 years differ by these types of EMS personnel: emergency medical responders, emergency medical technicians, intermediate or advanced EMTs, and paramedics?
6. What percent of patients experienced a “reversed opioid overdose” that EMS attributed to naloxone? Of these cases, was the ingested drug heroin, methadone, a prescription opioid, or a combination of 2+ opioids?
7. What percent of WARDS patients who received naloxone were NOT confirmed to have had an opioid overdose that led to the ambulance run?
8. What naloxone formulation and dosage is being used in the WARDS patients in the study years?
9. Are the patients who are given naloxone also receiving cardiopulmonary resuscitation? What number of the patients receive standard CPR or chest compression only CPR?
10. The PM Fellow should also ask DPH EMS scientists and managers if they have a specific administrative or technical need for information that could be addressed by the above or other analyses done by the Fellow.
Major Project  DETERMINE TRENDS IN ACUTE DRUG POISONING DEATHS AND IN OPIOID DRUG PRESCRIPTIONS AMONG MEDICAID ENROLLEES

Although individuals in every level of social class appear in reports on the occurrence of acute drug poisoning, cases are found disproportionately among persons who have lower incomes and education. For example, in the State of Washington the age-adjusted rate of death from prescription opioid overdose is nearly 6 times higher in Medicaid enrollees than in non-Medicaid enrollees (Centers for Disease Control and Prevention (CDC). Overdose deaths involving prescription opioids among Medicaid enrollees - Washington, 2004-2007. MMWR Morb Mortal Wkly Rep. 2009 Oct 30;58(42):1171-5).

Despite the limitations of Medicaid claims data, this and other large insurance programs have attracted the interest of many epidemiologists (see Bright RA, Avorn J, Everitt DE. Medicaid data as a resource for epidemiologic studies: strengths and limitations. J Clin Epidemiol. 1989;42(10):937-45). If in a state a certain subpopulation is highly exposed to a hazard or risk, then the state should look into the disparate situation and attempt to address it. A CSTE Fellow could undertake this project in collaboration with the Wisconsin Medicaid Program and with other entities of the DHS. Sources for this project could include Medicaid claims, death certificates, and hospital and emergency department discharges.

Surveillance Activity  DETERMINE THE SOCIAL AND ECONOMIC CHARACTERISTICS AND RISK FACTORS OF ACUTE DRUG POISONING DECEDANTS

Although the acute drug poisoning epidemic is nationwide, its nature and trends vary by state and locality. Therefore, to address this â€œwicked problem,â€ epidemiologists need to apply their knowledge and skills to version of the epidemic that appears in their jurisdiction. For example, provisional data on heroin deaths in Wisconsin support these findings: of every 10 such deaths, 9 are unmarried, 9 died at home, and 7 completed high-school or less education. A CSTE Fellow could verify the accuracy of these provisional data and could use standard epidemiologic methods to determine whether these are genuine risk factors for heroin poisoning deaths in Wisc. Similar analyses could be conducted deaths from other drugs, e.g., prescription opioids. If the above provisional data accurately describe some of the characteristics of Wisconsin heroin decedents, these findings can inform the selection and implementation of strategies to reduce heroin deaths and, perhaps, heroin overdoses.

Surveillance Activity  ASSESS THE ASSOCIATION BETWEEN OCCUPATION AND INDUSTRY AND ACUTE DRUG POISONING DEATH

This project is conceptually related to the project above, but it appears separately because of its novelty. Occupational epidemiology has a long and productive history of assessing job-related exposures and outcomes. Analysis of heroin deaths in Wisconsin indicates that the majority of decedents were employed and that they were often working in construction or food service industries. Although occupation and industry have not been collected, coded, and analyzed in all recent years by the state vital statistics staff, these important variables are currently available.
Review and analysis of these characteristics of acute drug poisoning decedents may lead to the following uses: (a) estimation of the relative risk of drug death by occupation and industry, (b) identification of occupations and industries with elevated relative risks that might be suitable for special studies by either DHS or University of Wisconsin, or other agency, (c) reporting to policymakers, partners, or general public that might reduce the stigma or stereotypes associated with drug use and abuse.

**Preparedness Role**
The Office of Preparedness and Emergency Health Care is located a few floors away. This office links many programs across the Division of Public Health (DPH) and the Department such as:

- Preparing for outbreaks, epidemics, and pandemics
- Syndromic surveillance
- Preparation for health impacts of natural disasters, nuclear incidents and chemical events
- Regional support for local health officers in an emergency
- EMS work on stroke system improvement and injury prevention
- Planning with long term care facilities to ensure that we meet the needs of patients, residents and clients during disasters and emergency situations.

We work directly with this office in the trauma systems and syndromic surveillance area. In addition, we can provide the Fellow with time to shadow some of the people working in this area and attend a state conference to learn what they do. In addition, the Fellow will take the 3 hour FEMA Introduction to Incident Command System Course in order to demonstrate basic knowledge of the Incident Command System (ICS) and be prepared to coordinate with response partners from all levels of government and the private sector.

**Additional Activities**

**EXPLORE THE FEASIBILITY OF DEVELOPING A RELIABLE AND VALID METHOD TO MONITOR CHRONIC PAIN PREVALENCE IN THE POPULATION**

As noted by the Institute of Medicine, an estimated 100 million Americans have chronic pain (Institute of Medicine (US) Committee on Advancing Pain Research, Care, and Education. Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research. Washington (DC): National Academies Press (US);2011). In this report, IOM notes that pain reduces quality of life and is managed poorly by the medical field. IOM defines two critical needs: consistent data on pain and a valid pain assessment tool. Because pain is the target of pharmaceutical pain relievers, pain surveillance at the population level by state would be useful to gauge the effectiveness of attempts to control the national epidemic of drug poisoning. A CSTE Fellow could contact the staff of the committee that wrote the IOM report to learn more about the committee’s findings about the state of pain measurement in both clinical and community settings. If pain is estimated for the US or individual states, some data might be available from or incorporated in the BRFSS (CDC) or NSDUH (SAMHSA).
CONDUCT PDMP TO BIRTH RECORD/FETAL DEATH LINKAGE
The 2013 enactment of the Wisconsin Prescription Drug Monitoring Program (PDMP) offers a timely and important opportunity to monitor and examine potential impacts of the Prescription Drug Overdose (PDO) epidemic among pregnant women, newborns, and fetal deaths. Utilizing standard record linkage techniques, it is possible to link birth and fetal death records with a corresponding PDMP record in the time period shortly before and during pregnancy. This can be derived from key dates in the databases with knowledge of the gestational age of the newborn or reported fetal death. This would allow us to track the prescription as a proxy for maternal/fetal exposure to prescribed opioids (and other controlled substances), and most importantly, examine the relationship of such prescriptions to the pregnancy outcomes noted on the birth and fetal death certificates on a statewide population basis. While this cannot track illicit use of prescriptive drugs, Meyer (2104) has shown that for women entering a treatment program for prescription drug abuse, 62% received the initial prescription legitimately by a physician.

PILOT A NEONATAL ABSTINENCE SYNDROME REPORTING SYSTEM (TENNESSEE MODEL)
The rate of NAS cases identified through Wisconsin hospital discharge data rose dramatically from 2008 to 2012 (5.18/1,000 to 9.0/1,000 hospital births). The mean length of stay for these cases increased from 10.9 to 14.4 days over the same period. Forty-two percent of NAS cases (956 out of 2278) coded for a causative substance. Of these, 53% (509 of 956) were due to narcotics. However as a surveillance system for NAS, looking at hospital discharge codes lacks timeliness and desired details (such as mother’s source of the drugs, illicit versus prescribed, type of drug) and other characteristics of its use as a surveillance system (simplicity, flexibility, acceptability, sensitivity, predictive value positive, and representativeness) have not been evaluated. This project would ascertain support, examine barriers and benefits, and potentially pilot and report on a replication of the Tennessee system in Wisconsin.

SURVEY OF INJURY PREVENTION ACTIVITIES IN TRAUMA AND OTHER HOSPITALS
Trauma centers are required to conduct injury prevention activities to maintain their national certification. In addition, the need to partner and collectively collaborate public health (injury) activities with health care institutions is greater than ever. However, the target populations, interventions, resources, breadth, evidence-based nature, and qualifications of the personnel implementing the injury prevention programs vary greatly across institutions. This project would conduct a web-based (telephone supplemented) survey of all 128 general med-surgical hospitals on these topics utilizing a modified survey instrument developed elsewhere.

SURVEY OF INJURY PREVENTION ACTIVITIES WITHIN LOCAL HEALTH DEPARTMENTS
Similarly, the nature and extent of injury prevention activities undertaken by local health agencies in Wisconsin is unknown. Limited central office staff, diverse funding sources and different ways of classifying activities makes it difficult to track these activities. This project would conduct a web-based (telephone supplemented) survey of the approximately 100 counties cities and tribal agencies.
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