Injury, Maternal and Child Health

State of Alaska, Division of Public Health

Anchorage, Alaska

Assignment Description

The follow will work in the MCH-Epidemiology Unit within the Section of Women's, Children's, and Family Health, but will also have extensive collaborative work with the Section of Health Analytics and Vital Records, the Section of Chronic Disease and Health Promotion, the Section of Epidemiology, the Section of Emergency Preparedness, the Office of Children's Services, the Office of Substance Misuse and Abuse, and the Alaska Native Tribal Health Consortium. These key organizations contribute to the multiple but fragmented injury prevention efforts across the state but are being unified through the Alaska Statewide Violence and Injury Prevention Partnerships (ASVIPP).

The fellow will experience direct mentorship from the Section Chief of Health Analytics and Vital Records. This will provide additional exposure to both the analytic and legal aspects of collection, maintaining, and reporting data. With a cross-sector mentorship, the fellow will be able to ensure full access to all data needed to be successful. Key efforts may include developing centralized data reports on the key priority areas identified in the ASVIPP strategic plan, including child maltreatment, suicide, domestic violence and sexual assault, falls, poisoning, and transportation related injuries. We are incredibly interested in documenting the shared risk and protective factors between these focus areas as well as providing actionable data that can direct and unify efforts across the state. The fellow will take a key role in developing these data products and analyses.

Specifically, the MCH-Epidemiology unit has a long history of providing reliable data on maternal and child health issues for use in planning and evaluating programs, preventing poor health outcomes, and guiding public health policy. We routinely link data from our surveillance programs with data collected elsewhere, such as vital statistics, WIC, child protective services, and Medicaid. The Unit has authored dozens of peer-reviewed articles and has been on the cutting edge of MCH-Epidemiology practice with programs such as the Alaska CUBS program and the Alaska Surveillance of Child Abuse and Neglect. For more information about the Unit and our programs, prospective fellows can visit our website at http://dhss.alaska.gov/dph/wcfh/Pages/mchepi/. By focusing on the maternal and child population and employing a life course perspective to injury prevention, the developed projects will have immediate impact, direct policy, and influence long term health outcomes in the state.

The unit will welcome a CSTE fellow as a full member of the scientific team, including them in decision-making and strategic planning processes and attending bi-monthly scientific unit meetings. The fellow will be encouraged to identify research needs and independently develop strategies for filling these gaps. The transition from academic investigation to applied epidemiology can be challenging but in this environment the fellow will gain confidence in working with secondary data sources and have a team of researchers to support this independent growth.

The MCH-Epidemiology Unit has been working at incorporating the life course framework into our work for the last several years, and by collaborating with multiple partners we expect to further explore the interaction between early childhood or fetal exposures and long-term wellbeing. This directive was the impetus for the creation of an ongoing longitudinal prospective cohort study that integrates the PRAMS responses with multiple administrative data sources (Alaska Longitudinal Child Abuse and Neglect Linkage (ALCANLink) project). The fellow will have the opportunity to be heavily involved in this novel and emerging project through analytic investigation, additional data linkages, evaluation, and streamline coding and packaging for national expansion. The fellow will be able to work with epidemiologists and researchers in states to implement this model, national funders, and gain national recognition and become a leader in the field. Further using the extensive data integration expertise in the MCH-Epidemiology Unit the fellow will investigate way to leverage the hospital discharge and ED data maintained by the state for key integration projects.

The fellow will have the freedom to work on a wide variety of topics of interest and will have access to data from all of Alaska's MCH surveillance programs and Health Analytic and Vital Records. Finally, some unique professional development opportunities that will be available to the fellow include working with the CDC Arctic Investigations Program (AIP), located in Anchorage and a past collaborator with our unit, and potentially traveling to remote Alaska villages to assist with a disease investigation. Due to the relatively small size of our health department and city, the public health and epidemiology community work and collaborate closely, and fellows are welcomed by not only our unit, but by other colleagues as well. The Section of Women's, Children's, and Family Health and the MCH-Epidemiology Unit take the responsibility of hosting a fellow seriously and will be responsible for providing the fellow with all appropriate workplace support, including statistical software, as well as helping the fellow to identify projects to work on. The fellow will be invited to participate on committees of interest and will be seen as a full member of the staff.

This assignment will provide the applicant with the opportunity to live in Alaska, and explore this magnificent area of the world. The fellow will work in Anchorage, Alaska, central to multiple outdoor and civic/cultural activities. Anchorage is extremely bike/ski friendly with paved and lighted paths, downhill and single track trails making year round riding/commuting a pleasure. Every imaginable outdoor activity exists including skiing (downhill and cross-country), climbing, hiking, kayaking/rafting, sailing, camping, rafting, hunting, fishing, snow machining, and dog sledding, all within a short distance of Anchorage. Many of the Unit members internalize their commitment to public health through regular enjoyment of many, if not all, of these activities. The fellow will be encouraged to explore this great state and become connected with people who share these interests. Although Anchorage is surrounded by amazing outdoor activities, it does have a large variety of cultural activities including a large and well-supported performing arts center, a local opera company, symphony, and chorus, numerous concert venues, and plenty of niche restaurants. Residents of Anchorage are from around the country and the world, giving the city a quasi-international feel not found in other parts of the state. In fact, it was recently recognized as having the most languages spoken in the public school system of any city in the country and its program for school aged refugees has gained national recognition. Winters are moderate (average temperature in Anchorage is 20oF). Many ask about the "long dark winters", but in Anchorage on the shortest day of the year we still

enjoy nearly 6 hours of sunlight and in the summer on the longest day of the year enjoy an amazing 22 hours of functional daylight. This dichotomy results in an always changing landscape to enjoy a variety of different activities. We have had numerous fellows and EIS officers and most have chosen to remain or return to this amazing place.

Day-to-Day Activities

A fellow's day-to-day activities working with us may include designing studies and programs, writing protocols, evaluating databases, writing reports and peer-reviewed manuscripts, attending meetings or teleconferences with partners throughout the state, contributing to research team meetings, and responding to media and public inquiries. The fellow will participate as a research lead and research team member for multiple projects, which will require the fellow to prioritize tasks, schedule meetings, and multi-task projects to meet deadlines. The fellow will utilize computers regularly for analysis, communication, and document development. The fellow will work closely with the scientific director and represent the Unit at statewide meetings, and serve as a statewide resource for epidemiology methods implementation.

An example of activities for a single day might include running analyses in SAS or R, creating charts or graphs for a presentation or report, attending a staff or other team meeting, and reviewing literature in PubMed and developing novel methods to address a specific data limitation/gap.

Potential Projects

Surveillance Activity **Alaska Statewide Violence and Injury Prevention Partnership data centralization**

The public health model relies on a foundation of sound and comprehensive population based data. Injury data in Alaska is fragmented across systems leading to incomplete understandings and context of these important issues. The ASVIPP strategic plan has set key focus areas that are being prioritized. To meet the ASVIPP strategies and goals Alaska needs centralized, accessible, and meaningful data. By being jointly affiliated with WCFH and HVRS, with support from other sections as well the fellow will collect, organize, develop, and distribute needed data points. Establishing specific data points, analytic investigations, and other important research endeavors will be paramount in influence public policy. The fellow will be tasked with establishing indicators, evaluating trends in data, and detecting outliers in risk of various injury outcomes.

The fellow will utilize a variety of software to organize these data, and can make them accessible online using the state based indicator system or by some other means like developing a R Shinny App or other application. Development and implementation of an injury surveillance model that emphasizes child and adolescents from a life course perspective will require the fellow to be creative and think outside the box for representing data that is meaningful. Anticipated outcomes include publications, presentations, website development, and reports.

Surveillance Evaluation **Hospital Discharge Data**

The Alaska Health Facilities Data Reporting Program (HFDR) collects inpatient and outpatient discharge data from Alaska health care facilities. The data collected comprise the Alaska Inpatient Database and the Alaska Outpatient Database. Health facilities discharge data show utilization of health services and provide evidence of the conditions for which people receive treatment. Data provide valuable information for decision makers at all levels, monitoring emerging issues in health status and health service delivery, and need for expanded services and facilities.

The HFDR system recently transitioned from a voluntary to mandatory based reporting system which is believed to have substantially improved the reporting into this system. The HFDR data is vitally important for understanding health care utilization but still has several constraints and limitations. The fellow will conduct a comprehensive evaluation of this system and particular focus on identifying key opportunities for data integration. Currently the research data available does not contain identifiers for data linkage, working with the vendor, section chief, and legal team the fellow will propose solutions to this barrier and pilot initial linkage projects. Anticipated outcomes include a comprehensive evaluation and recommendations.

Major Project Hospital Discharge data integration demonstration project

Based on initial linkage projects between HFDR data, vital records, ALCANLink, and the Alaska Birth Defects Registry the fellow will make recommendations on linkage standardization and centralization as well as future integrations to answer vital questions such as quantifying the number and type of hospitalizations prior to an Opioid Overdose death, or hospitalizations prior to child welfare involvement.

This project will involve conducting probabilistic linkages between data systems and gaining experience with large datasets. The fellow will learn how to manage data correctly and transform between wide and long formats. The fellow will develop and understanding of proper methods for Extraction, Transformation, and Loading (ETL) pre-processing of data to ensure data integrity is maintained. This crucial skill is vital to a developing professional and rarely address in MPH programs.

The fellow will utilize the ASVIPP strategic plan identified priority areas to direct the demonstration project development. Anticipated outcomes include integrated research datasets, publications, and presentations.

Major Project Alaska Longitudinal Child Abuse and Neglect Linkage (ALCANLink) expansion

The ALCANLink project was initiated in 2015 out of response for the need for population level longitudinal data to study the predictors and outcomes of child maltreatment over the life course. This system links the Pregnancy Risk Assessment Monitoring System (PRAMS) survey responses to child welfare, vital statistics, child advocacy, limited law enforcement data, and novel administrative sources allowing for population follow-up (Permanent Fund Dividend database of all residents who apply for a dividend of the state oil revenue, nearly 98% of all Alaska residents apply). This unique longitudinal data source has many advantages over full birth cohort linkages and is much more feasible to maintain. The fellow will become directly involved in the further development of this emerging and highly useful population level data source. Multiple additional datasets are available or need to be acquired to expand the scope of these data to allow for more comprehensive assessment. The fellow will link both maternal and paternal criminal record histories and juvenile justice histories, as well as Medicaid enrollment and claims data for both the mother and infant/child. The fellow will also work with the Hospital Discharge Data program to determine if a linkage can be made, and if not obtain records from the two major hospitals in the state. These nonfatal injury data will be crucial to studying a variety of different endpoints as well as the interplay between hospital utilization and maltreatment.

The fellow will also be directly involved in developing this linkage project into a national model that other PRAMS states can adopt. Working in partnership with the University of North Carolina at Chapel Hill, Injury Prevention Research Center the fellow will identify eligible states, ensure they have met the minimum criteria, and be involved in developing and reviewing grant applications for technical assistance to conduct the data linkages. The fellow will develop standardized code that can be used to analyze data longitudinally, create life tables based on the survivorship function, and use advanced statistical techniques to analyze and publish predictive and etiologic assessments. Some analysis may

include developing cumulative risk scores based on the Adverse Childhood Experiences model for each level of the ecological model and assessing the independent and combined effect through structural equations or other modeling techniques, assessing the time to first maltreatment report and subsequent frequency count to first confirmed report of maltreatment, and develop predictive models to those with only one or two reports vs those with many. Involvement with this data project will provide the fellow with multiple opportunities for publication and the ability to look at a variety of topics outside maltreatment with the longitudinal data, such as immunizations, childhood injuries, and behavioral and other developmental delays. Further the fellow will be a member of the research team and contribute substantially to further development of this important resource that to our knowledge is unlike any other source of data in any other state.

Major Project Fetal Alcohol Spectrum Disorder

Fetal Alcohol Spectrum Disorder (FASD) has impacted multiple Alaskans and substantially contributes to life-long morbidity and mortality. The relationship between FASD and injury is not well understood. The underlying issue is often the measurement of FASD. This project will require the fellow to develop novel methods for measuring FAS and potentially FASD in Alaska. This will require the development of epidemiologic studies such as a capture re-capture method, and utilize case sampling, confirmation, and weighting to estimate disease prevalence. Upon case compilation the fellow will integrate medical records and develop a case-control or cohort study depending on feasibility to understand the context of injury among this vulnerable population. Anticipated outcomes include statewide prevalence estimates of FAS, peer review publication, novel method development, and national recognition.

Preparedness Role

Although the primary focus of the fellowship will be maternal and child health, the fellow will have the flexibility to participate in other activities such as outbreak investigations and emergency preparedness exercises. One avenue for participation in emergency preparedness is by working with the MCH-Pediatric Disaster Planning and Emergency Preparedness program which is located in WCFH and works closely with the Section of Emergency Programs. The fellow could also have the opportunity to participate in Alaska Shield, the statewide biannual emergency preparedness training exercise that several WCFH staff have participated in in the past. Further, we anticipate that the fellow will become heavily involved in the Zika preparedness and response as well as Division response to the growing opioid epidemic.

Additional Activities

By focusing on the MCH population a CSTE fellow will have the ability to study nearly any topic area of interest outside of injury and be able to contribute to program and policy that can have nearly immediate effects on this vulnerable population. Additional potential activities could include:

- Using data from the Alaska Birth Defects Registry, evaluate associations between maternal chronic health conditions (such as diabetes and obesity) with various reported birth defects and develop at least one data report that includes recommendations for providers.
- Evaluate the impact of changes to the 2003 birth certificate version on key MCH trends for Alaska (These were implemented in Alaska in 2013.).
- Assist in the development of sentinel statewide maltreatment surveillance activities.
- Utilize data from ABDR and Alaska SCAN to assess the association between Fetal Alcohol Spectrum Disorders (including Fetal Alcohol Syndrome) and child maltreatment.
- Assess the association between a history of running away and child maltreatment.
- Study maternal mortality in Alaska.
- Develop and test a hypothesis for the association between community alcohol status (damp, wet or dry) and child injury and other outcomes including suicide, child maltreatment, educational attainment and resilient behaviors.
- Conduct an evaluation of the Early Hearing and Detection Intervention Program, including an analysis of linked EHDI and birth certificate data.
- Develop a community-level historical trauma scale by organizing a statewide action team and constructing a research tool. Bring the action team together to score all communities and then compare community outcomes (e.g. suicides, child maltreatment, all-cause mortality…).
- Assist the CDC Arctic Investigations Program with a vaccine study, for example travel to rural villages to recruit participants.
- Evaluate teen pregnancy and child protective services involvement of birth child.
- Assess the health profile of foster care children relative to non-foster care children in Alaska.
- Assess the relationship between Neonatal Abstinence Syndrome (NAS) and subsequent health care utilization among the Medicaid population.
- Work with the perinatal quality collaborative to improve data collection methods and surveillance to track opioid use and health outcomes among the maternal population.
- Develop and present short course epidemiologic methods topics to alearning collaborative.
- Participate in epidemiologic journal club to review articles and methods.
- Participate in a multi-disciplinary child death review and run a meeting.

Mentors

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Secondary	Heidi Lengdorfer BS, MPH
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