Assignment Description

The rapid advance of the opiate crisis had far reaching effects on all aspects of public health, straining existing systems with new challenges and high volumes of impacted individuals. Pregnant and postpartum women, infants, and families have not been spared. Accordingly, Ohio’s State Health Improvement Plan prioritizes both Mental Health and Addiction, and Maternal and Infant Health. The fellow would play a key role in the department’s efforts to improve and expand surveillance and data analysis on opiate use disorder in MCH populations to inform the development and coordination of efforts to prevent addiction and mitigate its impact. In the past year, BMCFH has taken on several initiatives to address this issue. These efforts include the following: 1) An opiate supplement was added to the states PRAMS survey; 2) Funding was secured from CDC to assure all pregnancy-associated deaths by unintentional overdose are reviewed and analyzed; 3) The first report on overdose among women is being developed; 4) The Director of Health determined that NAS was a condition reportable to the state birth defect registry, and; 5) Leading Ohio’s participation in OMNI, which aims to enhance collaboration between state, policy, and community. Despite these recent activities, there is additional work in this area that BMCFH would like to initiate that would be led by a fellow.

The fellow will be located within the BMCFH where both the primary and secondary supervisors are located. The fellow would be a valuable member of the Data and Surveillance team. They would contribute to developing epidemiologic capacity. The fellow’s work will be closely coordinated with and supported by ODH’s Violence and Injury Prevention Program. Projects are aligned with work of ODH partner agencies, the Ohio Department of Medicaid and the Ohio Department of Mental Health and Addiction Services.

Specific projects will include 1) evaluation of Ohio surveillance of Neonatal Abstinence Syndrome, which will support improvements in state surveillance and timely reporting (e.g., exploring NAS as a reportable condition); 2) development of a comprehensive system for surveilling opiate use within the MCH population, that will provide a stable and reliable system of linked data sets for monitoring selected indicators; 3) analysis of linked data sets to increase understanding of the consequences and underlying factors in maternal perinatal substance use in Ohio; and 4) evaluation of the Opiate Use Disorder, Maternal Outcomes, and NAS Initiative (OMNI).

Additional opportunities will be offered for the fellow to learn about public health in Ohio. These include tours of the ODH laboratory and vital statistics offices, site visits to local public health agencies, and participation in state-wide conferences or meetings. Opportunities for training exist with the state of Ohio and these may be available to the fellow depending on interest level. These include courses taught within the Ohio Department of Health, contracted SAS programming courses, and week-long courses taught at the Ohio State University College of Public Health’s Summer Program in Population Health.
Day-to-Day Activities

The fellow’s day to day activities will contribute to maternal and infant health priorities as they relate to substance abuse and overdose. The fellow will participate in weekly MCH Epidemiology section meetings and the BMCFH data workgroup that meets monthly. The fellow will have a standing weekly meeting with supervisors and a bi-weekly meeting with Jolene DeFiore-Hyrme, who leads the Violence and Injury Prevention Section (VIPS). The primary and secondary supervisor will schedule a monthly meeting with the fellow and Ms. DeFiore-Hyrme (ODH VIPS) to ensure communication across the programs so that the fellow can focus on the stated goals.

It is expected that the fellow become an active member of CSTE’s NAS workgroup if it is operating during the time of the fellowship. Participation in the workgroup will allow the fellow to connect with epidemiologists in other states who work with NAS surveillance and also to share what is being learned in Ohio. The fellow will also participate in Ohio’s Injury Prevention Partnership, and specifically two subgroups: the Data Action Group and the Prescription Drug Abuse Action Group.

Activities of the fellow will include conducting special investigations, communicating within and outside of the department and opportunities to participate in meetings, local conferences, and site visits that will enrich the fellowship experience. Most of the fellow’s work will be completed within multidisciplinary teams.

Potential Projects

Surveillance Activity Developing Surveillance of Perinatal Substance Use

The opiate crisis is having far reaching effects on all aspects of public health and health care, straining existing systems with new challenges and high volumes of impacted individuals. Maternal and Infant populations are not spared, from the unborn to the elderly. Existing surveillance systems concerned with maternal and infant health are not designed to monitor opiate abuse or its health outcomes on women, children and young families. Neither are they adequate to answer the myriad of new questions public health is faced with such as 1) how does opiate and other substance abuse impact infant mortality and through what mechanisms (birth defects, injuries, etc.), 2) how large is the problem of maternal overdose and what are risk factors for overdose in this population group, and 3) what are the outcomes of affected pregnancies.

To address this gap, the fellow will lead the development of a new surveillance system in Ohio that will take advantage of multiple existing data sources. Six data sources will form the core of the new system. They are Ohio’s

1) Pregnancy-Associated Mortality Review (PAMR): includes review data on all deaths to women who are pregnant or within one year of pregnancy,
2) Vital Statistics (VS) birth data: includes all live births to Ohio residents,
3) VS death data: includes all deaths (including infants who were born live and women),
4) VS fetal death data: includes deaths after 20 weeks gestation that occurred prior to birth,
5) Child Fatality Review (CFR): includes review data on all deaths to children aged birth to 18,
6) The Ohio Connections for Children with Special Needs (OCCSN), which is the state birth defects registry that will begin collecting NAS from hospitals in 2020, and
7) Ohio’s Violent Death Reporting System, specifically data from the State Unintentional Drug Overdose Reporting System (SUDORS) module.

Other data sources to be explored for inclusion include data from Ohio’s Automated Rx Reporting System, hospital discharges, Ohio Pregnancy Assessment Survey (a PRAMS-like survey) and the CDC-funded opioid supplement to PRAMS, hospital discharge, the Ohio Study of Associated Risks of Stillbirth (SOARS), and Medicaid billing.

Many, but not all, of the 7 data sources are routinely linked. However, the information necessary to investigate questions related to opiate abuse in the maternal and infant population are not stored and organized in a way to make them readily accessible. The fellow would assist in developing a data management process for doing this retrospectively and prospectively. Additionally, useful indicators for monitoring opiate and other substance abuse in this population have not been defined. The fellow would lead the identification of indicators to be monitored in the new surveillance system. Finally, the fellow will assist with planning for how the data from the surveillance system will be shared and communicated both internally and with external partners.

Surveillance Evaluation    Neonatal Abstinence Syndrome Surveillance Evaluation

Neonatal abstinence syndrome (NAS) is a set of symptoms associated with the abrupt withdrawal of opioids and other drugs when infants are born to mothers who were taking these substances. The symptoms can range from mild to severe, with the most common associated conditions being respiratory complications, low birth weight, feeding difficulties and seizures.

As of July 10, 2014, Ohio Revised Code requires maternity units, newborn care nurseries, and maternity homes to report to ODH the number of newborns diagnosed as opioid dependent at birth, commonly referred to as NAS. To assist hospitals in complying with this law, ODH partners with the Ohio Hospital Association to receive aggregate data on hospital discharges associated with NAS. Based on hospital discharge data, Ohio has found the following: hospital discharge data have demonstrated that between 2006 and 2018 in Ohio, 17,373 inpatient hospitalizations resulted from NAS. In 2018 alone, there were nearly 5 admissions per day. Over that time, the rate of NAS grew nearly 7 times from 20 to 142 per 10,000 live births and the average charge associated with NAS hospitalizations increased from $39,561 to $69,257 while the average stay (LOS) fluctuated between 13 and 16 days. In 2018, the average inpatient charge was almost four times higher for NAS infants, and the average LOS was three times greater than for all Ohio infants. Data on exposure to noxious substances through the placenta or breast milk suggests an increasing number of infants are exposed to opioids (i.e., heroin and prescription pain medication) and hallucinogens. About 8,707 infants were exposed to opioid and hallucinogens between 2016 and 2018. Opioid and hallucinogens combined have surpassed cocaine as the common drugs of exposure in 2009 and remained the leading drugs of exposure in 2018. In addition to the rise in NAS, approximately 16,254 hospitalizations resulted from drug abuse or dependence among mothers at time of delivery between 2016 and 2018. Hospitalization rates grew 1.5 times from 314 per 10,000 in 2016 to 470 per 10,000 discharges in 2018. Opioid continue to be the second most common drug abused among mothers at time of delivery after marijuana.
However, basing NAS surveillance on aggregate reports has limitations. In November 2019, the Director of Health determined that NAS would be reportable to the state’s birth defects registry, This will be operationalized using ICD-10 codes in alignment with the 2019 CSTE position statement to standardize NAS surveillance.

Given the public health importance of NAS and related issues, understanding the completeness and quality of reported data is vital to interpretation and application of these data to program planning and evaluation. The fellow will use CDC’s surveillance evaluation methodology to assess Ohio’s NAS surveillance (considering reporting both through hospital discharge data alone and the newly implemented reporting through the birth defects registry) compared with CSTE’s 2019 standardize surveillance position statement. Ohio is particularly interested in how well Ohio’s current NAS surveillance captures the events that it is intended to capture. Methods of assessing sensitivity and specificity may include limited clinical chart review, or collaboration with the Ohio Perinatal Quality Collaborative’s effort to increase consistent scoring of NAS for all infants. The ODH VIPS and OCCSN are interested in recommendations for improving the quality of NAS surveillance.

Improved data will assist ODH and their partner agencies, the Ohio Department of Mental Health and Addiction Services and the Ohio Department of Medicaid, in assessing the burden of NAS, and inform current and future initiatives to reduce incidence and impact of opiate use disorder and NAS.

**Major Project  Perinatal Substance Use in Ohio: Underlying Factors and Consequences**

The major project will include a series of data analyses based on the existing and proposed data linkages outlined in the fellow’s Surveillance Activity. Through these data linkages, gaps in current understanding of the consequences of and underlying factors in perinatal substance use in Ohio can be filled concurrently with the identification of opportunities to improve outcomes for families. Each of the analyses will be completed as part of interdisciplinary teams. Defining a public health problem, planning and completing a project, and communicating results will require that the fellow work with staff across the department and partners outside of the department. The fellow is encouraged to publish the results of projects and will be supported in doing so. Statistical analyses will be supported by supervisors and MCH epidemiology staff. The fellow’s interests, strengths, and individual training needs will influence the specific analysis projects undertaken. Proposed analyses include:

- Geographic mapping across the state with relation to maternal mortality from overdose and infant mortality (main data sources: VS, PAMR)
- Describe birth outcomes associated with maternal mortality from overdose (main data sources: VS, PAMR, CFR)
- Investigate the association between maternal mortality from overdose and fetal, infant, or child mortality (main data sources: VS, PAMR, CFR)
- Estimate the prevalence of chronic and psychosocial co-morbidities associated with maternal opioid use disorder (main data source: hospital discharge)
- Estimate the burden of maternal opioid use before and during pregnancy on birth defects, NAS, preterm birth, low birth weight, and infant mortality (main data sources: VS, hospital discharge, OCCSN, Medicaid, Rx Reporting System)
- Study the association between maternal substance use and infant or child injury
• Assess the association between treatment of substance use disorder and birth outcomes (main data sources: VS, Medicaid)

**Additional Project**

**Evaluation of Ohio’s OMNI learning collaborative efforts**

The ASTHO Opioid Use Disorder, Maternal Outcomes, and Neonatal Abstinence Syndrome Initiative (OMNI), is a learning community funded through CDC’s Division of Reproductive Health and the National Center for Birth Defects and Developmental Disabilities. The purpose is to disseminate strategies and best practices supporting program and policy implementation related to SUD. Ohio was one of 13 states to join OMNI in 2018. The team is led by ODH and includes members from ODM, OMHAS, and ODJFS. Members identified the following problem statement: “The Use of opioids and other drugs, are creating significant morbidity and mortality among Ohio women of reproductive age and their children” and the team aim is to enhance collaboration between state, policy, community, and clinical partner to ensure appropriate care for pregnant and postpartum women and infants diagnosed with NAS. The specific goals are to

1. increase awareness and knowledge about plans of safe care, and
2. implement at least 2 best practices to improve care coordination and transition care before and following delivery of the child and through the life course.

Eight Appalachian counties with high SUD and NAS burden were selected for the first phase of this work. The fellow will assist Ohio’s OMNI team in finalizing and implementing a plan to evaluate the process and outcomes of the initiative in the state.

**Preparedness Role**

As with past CSTE fellows and EIS officers, the fellow will be invited to participate in trainings, planning meetings (such as the Bioterrorism Steering Committee Meeting), desktop exercises, and other elements of Ohio’s emergency preparedness plan such as school emergency planning. Potential preparedness activities in BMCFH for the fellow include 1) reviewing continuity of operations plan (COOP) for metabolic formula, 2) representing MCH on ODH’s preparedness month planning team, and 3) coordinating preparedness awareness activities for MCH programs (e.g. WIC coordinators, PHNS). The secondary supervisor served a role as MCH point person for Zika response and has working relationships with staff in related programs. The State Epidemiologist and Bureau of Health Preparedness have committed to providing additional support and opportunities for the fellow’s involvement in emergency preparedness.

**Additional Activities**

The fellow may engage in additional activities as interested and opportunities permit. Potential activities include 1) analyzing data from the opiate supplement to Ohio’s PRAMS-like survey, and 2) serving as a review committee member for Ohio’s Pregnancy-Associated Mortality Review.
Mentors

Primary Reena Oza-Frank PhD, RD
Data and Surveillance Manager

Secondary Elizabeth Conrey PhD, MS, RD
Senior MCH Epidemiologist