

## **Birth Defects and NAS, Maternal and Child Health**

### **Georgia Department of Public Health, Division of Epidemiology/Maternal and Child Health Epidemiology Unit**

Atlanta, Georgia

#### **Assignment Description**

The CSTE Fellow will work in the Maternal and Child Health Epidemiology Unit (MCH EPI) in the Epidemiology Division. Dr. Bryan is the Director of MCH EPI, while the State Epidemiologist, Dr. Cherie Drenzek, oversees all epidemiology activities. MCH EPI is one of five units in the Division; the others are (1) Acute Disease Epidemiology, (2) Chronic Disease, Healthy Behaviors and Injury Epidemiology, (3) HIV/AIDS and Infectious Diseases Epidemiology (Sexually Transmitted Infections, Tuberculosis, and Hepatitis), and (4) Office of Health Information for Planning.

The mission of MCH EPI is to optimize the health of Georgians by preventing and mitigating negative maternal and child health outcomes, including maternal and infant morbidity and mortality. MCH EPI is dedicated to fulfilling its mission by using epidemiologic methods to:

- Conduct surveillance of numerous maternal and child health-related conditions:
  - birth defects
  - neonatal abstinence syndrome (NAS) (in collaboration with the Georgia Perinatal Quality Collaborative)
  - maternal mortality (in collaboration with Georgia's Maternal Mortality Review Committee)
  - severe maternal morbidity (in collaboration with the Georgia Perinatal Quality Collaborative)
  - infant mortality (in collaboration with MCH Title V program partners)
  - infant morbidity, including projects with Newborn Screening and Early Hearing Detection and Intervention
- Implement and analyze statewide surveys, including the Pregnancy Risk Assessment Monitoring System (PRAMS), 3rd Grade Oral Health Screening Survey, the Head Start Oral Health Screening Survey, and the Behavioral Risk Factor Surveillance Survey (BRFSS).
- Publish and disseminate public health information to elected officials, stakeholders, and the public: statistical reports (e.g. surveillance reports and health profiles), data summaries on topics pertinent to programs, annual data summaries, and educational materials (e.g., infographics).

## Day-to-Day Activities

MCH EPI is comprised of three surveillance teams: (1) Health Surveys, (2) Perinatal Epidemiology, and (3) Newborn Surveillance. The CSTE Fellow will primarily be working with the Newborn Surveillance Team, where both birth defects and neonatal abstinence syndrome surveillance occur. The CSTE Fellow will have the opportunity to work on a range of projects in these areas:

- 1) Contribute to the ongoing development of the Georgia Birth Defects Registry (BDR). The BDR features complex and intensive informatics that (1) pulls data from many data sources, ranging from vital records data (birth certificates, death certificates, and fetal death certificates) to early intervention services (Children's Medical Services) and newborn screening data (pulse oximetry and hearing screening), (2) allows for on-the-fly tracking of the medical record request process, (3) permits case confirmation, and (4) provides basic descriptive statistics of related diseases. Posters stemming from efforts to validate the data used in the BDR (birth certificates and hospital-based line lists) have won the best poster award in consecutive years for the Maternal and Child Health, Chronic Disease, and Oral Health section at the CSTE annual conference. The Fellow will further help lead the validation of multiple data sources used for birth defect case ascertainment, including fetal death certificates, death certificates, and newborn screening. There is the potential to perform unique analyses on data stemming from the recent public health emergency - Zika-related birth defects. The Fellow may participate in medical record abstraction as part of the case verification process for suspected birth defects.
- 2) Enhance surveillance of neonatal abstinence syndrome (NAS) in Georgia. Dr. Bryan served on the NAS case definition workgroup that created the first national standard case definition of NAS for surveillance. This case definition was adopted in June 2019 by CSTE and Georgia will be implementing this new case definition beginning January 1, 2020. Existing surveillance efforts rely on health provider reporting, which is likely underestimating the burden of NAS. This project aims to evaluate complementary data sources as a means of enhancing NAS surveillance for Georgia. The Fellow may also identify novel projects to assist in better understanding the etiology of NAS.
- 3) Develop surveillance infrastructure for Congenital Infections Registry (CIR). Building on previous efforts to perform surveillance on infants with congenital exposure to the Zika virus, MCH EPI was awarded funding to perform longitudinal surveillance on congenital syphilis exposure initially and other exposures over the course of the project period (e.g., Hepatitis C and HIV). This novel surveillance project is part of the CDC's Surveillance for Emerging Threats to Mothers and Babies (SET-NET). The Fellow will provide guidance on the development of the CIR and perform follow-up on infants with congenital exposure to syphilis.
- 4) Assist in surveillance and epidemiologic analyses of Newborn Screening and Early Hearing Detection and Intervention data. These data sources come from mature surveillance systems but have not been effectively summarized using basic epidemiology principles (e.g., distribution of morbidity in the population). We want to create an overall profile of infant health in Georgia using these data sources.
- 5) Participate in statewide survey efforts, particularly as they involve implementation and analysis of Pregnancy Risk Assessment and Monitoring System (PRAMS) and oral health surveillance data. PRAMS focuses on preconception, pregnancy, and postpartum health behaviors, knowledge, and exposures of interest. Recently, Georgia has been participating in two PRAMS

supplements (opioid and disability). The Fellow may help lead analyses on these supplements, in collaboration with other Epidemiology surveillance teams and programmatic partners (e.g., the Overdose Surveillance Team).

- 6) Georgia has been piloting PRAMS for Dads with Northwestern University, a novel project aiming to determine the best modality for reaching the fathers of recent liveborn infants. In November, MCH EPI will be presenting to the CDC's Division of Reproductive Health with Northwestern representatives on this pilot project and initial findings. The Fellow may perform analyses to understand the response pattern of dads and provide analysis assistance on understanding health behaviors, knowledge, and attitudes during the periconceptual period.
- 7) Support improvements in maternal mortality surveillance. The Fellow may assist in this effort in numerous ways, including (a) integrating the use of surveillance data collected at DPH into the case abstraction process, (b) further developing ecological health indicators from which the Maternal Mortality Review Committee may better understand the social context of a death, and/or (c) improving the case identification process.

The Fellow will have the opportunity to work in and contribute to a high performing MCH EPI group that has produced two award-winning CSTE posters for the past two consecutive years. The Fellow will gain valuable experience in many areas of epidemiology, but certainly with a focus on birth defects and NAS. The fellowship would provide ample and wide-ranging opportunity for developing subject-specific reports in collaboration with the MCH Title V team.

## **Potential Projects**

### **Surveillance Activity    Georgia Birth Defects Registry**

While active birth defects surveillance has been ongoing in the metropolitan Atlanta area for nearly four decades conducted as a gold standard activity in collaboration with CDC, there is no current way to estimate statewide incidence or prevalence of birth defects - a notifiable condition - in Georgia. To overcome this gap in surveillance, since August 2016 DPH epidemiologists and related IT staff have been developing a Birth Defects Registry. This passive surveillance system with case confirmation should be "live" by early 2020. A key part of the Registry is having flexibility in preparation for emerging infections resulting in birth defects and similar adverse birth outcomes, as was the case with the Zika virus. The CSTE Fellow would participate in the surveillance of birth defects in Georgia using the Birth Defects Registry as the primary tool. This surveillance effort will include an initial education on how to use the Birth Defects Registry, a web-based surveillance system developed internally as part of the State Electronic Notifiable Disease Surveillance System (SendSS), request and track medical records, and how to abstract medical records for case verification. The CSTE Fellow will have the opportunity to both gain insight into an incredibly complex informatics process and to engage efforts to improve the overall surveillance.

### **Surveillance Evaluation            Neonatal Abstinence Syndrome Surveillance System Evaluation**

The existing NAS surveillance system relies on health provider reporting with case verification. This methodology is likely underestimating the burden of NAS. Recently, Georgia decided to adopt the case definition passed by CSTE in June 2019. The CSTE Fellow would help improve our capacity to effectively

capture data pertaining to this case definition. This project would evaluate the use of complementary data sources (e.g., birth certificates and electronic laboratory reports (ELR)) as a means of enhancing NAS surveillance throughout the state without increasing the burden of reporting. This project would allow the CSTE Fellow to apply surveillance system evaluation concepts to a functional surveillance system with identifiable public health significance that seeks to improve its capacity.

### **Major Project Maternal and/or Infant Health Profiles**

MCH EPI has access to numerous data sources that can inform Maternal and Infant morbidity and mortality. At its core, a major project would be an effort to amalgamate these different data sources into a coherent profile of either maternal or infant health. For example, a profile of infant health could pull from many data sources, including different Vital Records (Birth and Death Certificates, Fetal Death Certificates), Hospital Discharge Data, perhaps WIC data, the Birth Defects Registry, the Neonatal Abstinence Syndrome Surveillance System, other Notifiable Disease Surveillance Systems, HIV/AIDS surveillance data, and the Newborn Screening and Early Hearing Detection and Intervention surveillance systems, as well as social determinants of health data. A similar effort could be performed for maternal health, but incorporating other data sources like the Maternal Mortality Review Committee data, Opioid Surveillance, integration of the Prescription Drug Monitoring Program data, Immunization data (GRITS), Hospital Acquired Infections (HAI) data inclusive of NHSN CLABSI reporting, zoonotic and vectorborne disease surveillance data, Emerging Infections Program (EIP) datasets, FoodNet, and/or Active Bacterial Core (ABC) surveillance.

This sort of profile has not been done in Georgia for an extended period of time. Doing so would help provide DPH with a framework to communicate and understand the health burden, health disparities, potential target populations and/or diseases for improving infant and maternal health. DPH has a particular interest in understanding, promoting, and communicating on preconceptional health. This would also provide the fellow with the experience of producing a report from initial conceptualization, to analysis, to final production.

### **Surveillance Activity Congenital Syphilis Case Ascertainment Validation**

DPH was recently awarded Component W of the Epidemiology and Laboratory Capacity grant - Surveillance and Monitoring of Infants with Congenital Exposure to Emerging Infectious Diseases and Other Health Threats. In conjunction with birth defects surveillance, DPH will be performing longitudinal surveillance on infants with congenital exposure to syphilis. In pursuit of the goals of this grant and in conjunction with the HIV/STD Epidemiology Unit, the CSTE Fellow would seek to validate the different means of identifying infants with congenital exposure to syphilis, including the use of birth certificates and medical record review. In doing so, the CSTE Fellow could assist DPH with ensuring complete data is collected on exposed infants and that all exposed infants are identified. Other congenital exposures (e.g., Hepatitis C and HIV) may be added in future years of the project period.

### **Surveillance Evaluation Severe Maternal Morbidity**

Performing surveillance on Severe Maternal Morbidity (SMM) is an emerging topic of importance at DPH. The Georgia Perinatal Quality Collaborative (GaPQC) has as its mission to "establish and maintain a robust statewide perinatal data and quality improvement system that engages stakeholders in evidence-based practices to improve health outcomes for mothers and babies throughout Georgia." Specifically,

the CSTE Fellow would be responsible for assisting in the development of a rapid-response perinatal surveillance system that collects, analyzes, validates, and distributes severe maternal morbidity data on a monthly basis using hospital discharge data. An important component of this surveillance will be to establish and implement a methodology to validate the use of hospital discharge data for identifying severe maternal morbidity using a protocol from the Alliance for Innovation on Maternal Health (AIM) bundles on relevant SMM health outcomes.

### **Preparedness Role**

There are many opportunities for involvement with emergency preparedness, including: participating in emergency responses; developing a plan to implement the ICS command structure for disease outbreak investigations; developing a plan for DPH first responder pre-deployment and just-in-time training, using a recently developed responder tracking system, as well as deployment and post-deployment health and safety monitoring; developing standard operating procedures for responding to zoonotic disease outbreaks that affect the human and veterinary community; and analyzing shelter surveillance data and barriers to reporting during recent hurricanes. The Fellow will receive Incident Command training to enable deployment in our Emergency Operations Center during an event.

### **Additional Activities**

Our goal is to give the CSTE Fellow the richest experience possible. They will have the opportunity to participate in a wide-range of maternal and child health investigations. Within DPH, Maternal and Child Health has a good deal of visibility and, as such, receives a number of data requests from legislators, media, program partners, and other stakeholders. The CSTE Fellow will have the opportunity to not only work as an epidemiologist in wide array of subject areas, but also to get involved with using epidemiology to make real changes to programs that have an impact across Georgia. We will seek to tailor the experience based on their interests and will be flexible in doing so, while providing mentorship and guidance on both epidemiology in particular and professional development in general. Further, we will encourage the CSTE Fellow to disseminate their work via a number of avenues, whether through fact sheets, data summaries, manuscripts, or conference presentations.

### **Mentors**

<b>Primary</b>	Michael Bryan, PhD, MPH Director, Maternal and Child Health Epidemiology
<b>Secondary</b>	Cherie Drenzek, DVM, MS State Epidemiologist, Chief Science Officer