**Assignment Description**

This COVID-19 pandemic is broad and affects everyone. Prioritizing maternal and child health populations prioritized amid this has been a challenge. It is known that the physiologic changes of pregnancy may increase the risk of severe illness including increased heart rate and oxygen consumption, decreased lung capacity, and a shift away from cell-mediated immunity. Severe disease has been associated with other viral respiratory infections in pregnant women such as influenza and SARS coronavirus. A better understand the epidemiology of COVID-19 among pregnant women and infants is critical for understanding clinical course in pregnant women with COVID-19 and their neonates (regardless of whether the infant meets the case definition for a laboratory-confirmed case). It’s important to try to understand the direct effects of COVID-19 on pregnant women and infants, but also to study the indirect effects of the pandemic: for example, risk of preterm birth due to stress, risk of unintended pregnancy due to lack of contraception, impact on preventative services.

The Fellow will work with the primary and secondary supervisors to provide a focus on monitoring and studying COVID-19 in this priority population. This work will occur in coordination with the State Epidemiologist and infectious disease epidemiologists in BID. The Fellow’s activities will inform the programmatic work of BMCFH with maternal and child health populations with the identification of high-risk groups, unmet needs, and emerging priorities.

The Ohio Department of Health (ODH) is a cabinet-level state agency accredited by the Public Health Accreditation Board. ODH’s mission is to protect and improve the health of all Ohioans by preventing disease, promoting good health and assuring access to quality care. ODH fulfills its mission through collaborative relationships in the public and private sectors, including over 100 local health departments. The agency’s agenda is informed by a Strategic Plan, State Health Assessment and a State Health Improvement Plan.

The Fellow would be placed in the ODH’s Bureau of Maternal, Child and Family Health (BMCFH). The primary mentor reports to the Chief of BMCFH and works closely with the secondary mentors, who are with the Data & Surveillance section of BMCFH. The section includes a team of epidemiologists and researchers as well as surveillance systems that include the Ohio Pregnancy Assessment Survey (OPAS) and the Study of Associated Risks of Stillbirth (SOARS). The section includes review programs for Pregnancy-associated Mortality (PAMR), Child Fatality (CFR), and Fetal and Infant Mortality (FIMR). Other BMCFH programs include infant mortality, home visiting, reproductive health, women’s health, tobacco prevention, WIC and Children with Special Healthcare Needs.

The BMCFH reports to the Medical Director as does the Bureau of Infectious Diseases, overseen by the State Epidemiologist. BMCFH and BID coordinate and collaborate on joint priorities including the supervision of an ODH-based EIS officer and Zika Virus Disease surveillance.

Specific projects will include

1. surveillance of outcomes following a pregnancy with confirmed SARS-CoV-2 infection;
2. evaluation of the completeness of pregnancy identification among confirmed SARS-CoV-2 cases using the COVID-19 Case Report Form by linkage with vital statistics records;
3. analysis of COVID-19 supplement data from existing maternal and child health surveillance systems to increase understanding of outcomes, risk-factors and pandemic impacts on health behaviors and preventative health care access.

Additional opportunities will be offered for the Fellow to learn about public health in Ohio. These include (when feasible) 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 through the Ohio Department of Health, contracted SAS programming courses, and week-long courses taught by 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 COVID-19 priorities as they relate to maternal, infant, and child health populations. 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 the primary supervisor and a bi-weekly meeting that includes the secondary supervisors.

Activities of the Fellow will include conducting special investigations, communicating within and outside of the department. There will be opportunities to enrich the Fellowship experience including participating in meetings, local conferences and trainings, and when feasible, site visits. Most of the Fellow’s work will be completed within multidisciplinary teams. Currently most ODH staff are working remotely using ODH-supplied technology and the timing of return to the office environment is unknown. The BMCFH and the Data and Surveillance Section have made wide use technology for remote collaboration including Skype and Microsoft Teams. VPN provides seamless access to shared documents, large files, and software (e.g., analytical).

**Potential Projects**

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In April 2020 the CDC released a pregnancy module to the COVID-19 case report form (CRF) that is comprised of a Pregnant Case Form and a Neonate Form. The module includes surveillance questions for the mother on the clinical course of disease including severity of disease, treatments, mortality, timing of SARS-CoV-2 infection, presence of symptoms, and underlying risk factors; for delivery on adverse fetal and birth outcomes of infants born to mothers with SARS-CoV-2 infection; and for the neonate on frequency and risk factors for neonates testing positive for SARS-CoV-2 infection.

ODH is modifying its disease reporting system for COVID-19 to capture all fields within the pregnancy module and create .CSV files for export to CDC’s Data Collation and Integration for Public Health Event Response (DCIPHER) platform.

The Fellow would oversee the collection and maintenance of data for the pregnancy module and coordinate with both BID and BMCFH staff to ensure seamless data collection. This will include identification of pregnant COVID-19 cases within the existing surveillance system, following case-patients until due dates, identifying birth or fetal death certificates within the states vital records system, contacting clinicians for additional information, and abstracting relevant information.
Data for CDC’s COVID-19 CRF are maintained within Ohio’s Ohio Disease Reporting System (ODRS). ODRS includes case status (i.e. confirmed or probable) demographic information (e.g. address, DOB, race/ethnicity), lab data (e.g. diagnostic tests, specimen collection date, etc.) and clinical information (e.g. symptom onset, symptoms and severity, pre-existing conditions, clinical course, hospitalization, etc.). A pregnancy variable documents current pregnancy status for all females. The Fellow will evaluate the quality of the pregnancy variable. Preliminary data show that the variable is missing a value about 40% of the time.

To confirm pregnancy status, the gold standard will be a live birth or fetal death documented within Ohio’s vital statistics. The ODRS data will be linked to birth and fetal death certificate data by probabilistic matching utilizing LinkPlus 3.0 on mother’s (case) first and last name, DOB, and county of residence. Following linkage, the Fellow will quantify the missingness, and accuracy (sensitivity, (predictive value positive and predictive value negative) of the pregnancy variable. Confirmation of pregnancy among confirmed COVID-19 cases will also allow for erroneous data to be corrected in ODRS and for identification of additional cases for which the pregnancy module could be completed.

The proposed supervisors are preparing a protocol for this linkage to submit to the ODH Internal Review Board for Human Subjects protection.

The Ohio Pregnancy Assessment Survey (OPAS) is a statewide, ongoing, targeted population-based survey that utilizes the Centers for Disease Control and Prevention (CDC) Pregnancy Risk Assessment Monitoring System (PRAMS) methodology to collect information from women who had a live birth in Ohio. OPAS data provide information not available from other sources about pregnancy and the first few months after birth. This information can be used to identify groups of women and infants at high risk for health problems, to monitor changes in health status, and to measure progress towards goals in improving the health of mothers and infants. Additionally, the OPAS is used to investigate emerging issues in the field of reproductive health. Sampled women are contacted approximately 2-4 months after delivery and can participate by completing a mailed survey, online survey, or telephone survey.

The Ohio Study of Associated Risks of Stillbirth (Ohio SOARS) is a statewide, population-based survey designed to collect information on maternal experiences and behaviors before, during, and after pregnancy among women who experienced a stillbirth in Ohio. SOARS will provide critical, timely population-based data to better understand the risks of stillbirth and measure progress towards goals in reducing stillbirth. The questionnaire collects data not available in medical records or on fetal death certificates topics such as life experiences before and during pregnancy, social support and stress, services and medical tests offered in hospitals after a stillborn delivery, substance use, and grief and bereavement support. Women are contacted to complete the survey approximately 2-3 months after a reported loss and can participate by completing a paper survey delivered via mail, online survey, or telephone survey.

Earlier this year, Ohio amended the 2020 OPAS and SOARS questionnaires to add supplemental questions related to COVID-19. The supplement is comprised of four additional questions that each
respondent receives at the end of their survey. Data collection for births and fetal deaths that occurred in 2020 has begun.

The Fellow will analyze the data collected from the supplements to study the prevalence of pandemic-induced financial difficulty, healthcare access issues, and anxiety or depression.

### Additional Projects

**Analysis of the Outcomes of SARS-CoV-2 Infected Pregnancies**

Using the linked ODRS and Live Birth and Fetal Death files, the Fellow will study outcomes of pregnancies with confirmed SARS-CoV-2 infection. In addition to the ODRS data on infection, the birth and fetal death certificate data provide information such as birth weight, gestational age, abnormal conditions of the newborn (e.g. congenital anomalies, seizures, assisted ventilation, transfer to ICU, etc.), method of delivery (e.g. vaginal, cesarean, etc.) and characteristics of labor and delivery (e.g. cord prolapse, excessive bleeding, etc.). Trimester of infection can be calculated from illness onset date, infant's birth date or fetal death date, and gestational age.

The Fellow will calculate frequency of adverse outcomes among women with confirmed or probably COVID-19 infection. The proportion of these outcomes will be compared to women with no known COVID-19 infection to determine any association of outcomes with infection. Additionally, the Fellow will determine if there are significant differences based on trimester of infection, pre-existing conditions of the mother, mother’s age, and race/ethnicity.

### Preparedness Role

As with past Ohio 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 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. It is important to monitor the indirect effects of the pandemic on pregnant women and infants. Examples are the risk of preterm birth due to stress, risk of unintended pregnancy due to lack of contraception, impact on health care access and preventative services. The Fellow would identify priority indicators for monitoring and sources of timely data. These could include birth certificates to monitor timing of prenatal care; Medicaid data to monitor infant well visits; fetal death certificates to monitor causes of fetal death over time; and Ohio Pregnancy-Associated Mortality Review for changes in maternal deaths. Other potential activities include serving as a review committee member for Ohio’s Pregnancy-Associated Mortality Review.
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| **Primary** | Elizabeth J Conrey, PhD, MS, RD  
Senior MCH Epidemiologist |
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Epidemiology Supervisor |
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