Franklin County
Fetal-Infant Mortality Review (FIMR)

Case Review Team Findings: Year Three

(January–December 2017)

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May 11, 2018

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EXECUTIVE SUMMARY

Columbus Public Health (CPH) established the Franklin County Fetal-Infant Mortality Review (FIMR) Program in January 2014. At its core, FIMR is an evidenced-based continuous quality improvement process. The process starts with the detailed review of de-identified cases of fetal and infant death by a multidisciplinary Case Review Team (CRT) comprised of experts from the fields of community engagement, family violence, grief support, housing, maternal mental health, neonatology, nutrition, obstetrics, perinatal home visiting, public health and social services. This group examines the significant social, economic, cultural, safety and health systems' factors associated with fetal and infant mortality, and proposes recommendations to support optimal birth outcomes. On an annual basis, the CRT shares its observations with a Community Action Team (CAT), which then determines how best to address barriers to care and gaps in service delivery and to "create social and physical environments that promote good health for all."[1]

Between January and December 2017, the CRT met monthly to review a total of 48 cases (34 fetal, 14 infant). Of these 48 cases, 25 included a family interview. On average, the CRT spent 30-60 minutes discussing the themes and needs of each case. By design, cases with known risks were prioritized so FIMR could learn more about our community's service system gaps.

The CRT's recommendations are based on these findings and are organized in the following sections according to broadly-encompassing social determinants of health categories: individual behavior, physical environment, medical care, biological processes and social circumstances. FIMR acknowledges that the variables impacting maternal child health outcomes are complex and could fall in more than one category in this model. The intent is not to oversimplify the overlapping nature of the various issues, but to illustrate that medical care is but one of many factors which contributes to fetal and infant mortality.

2017 FIMR RECOMMENDATIONS

Individual Behavior

- Promote access to and use of effective family planning methods to avoid unintended pregnancy
- Improve assessment & treatment of mental health & substance abuse

Physical Environment

- Improve access to safe housing and decrease community violence

Medical Care

- Strengthen patient-provider relationships to enhance medical care experiences

Biological Processes

- Support opportunities for optimal health before pregnancy

Social Circumstances

- Layer supports for families experiencing trauma and multiple stressors

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THE PROBLEM

Infant mortality – or the death of a baby before his or her first birthday – is a critical indicator of community health. Every year in Franklin County, approximately 150 babies die before their first birthdays. Fetal death – or the death of a fetus at any time during pregnancy – is not included in these infant mortality numbers. On average, there are 130 fetal deaths reported in Franklin County each year. However, these deaths are not evenly distributed across our community. Non-Hispanic Black infants in Franklin County are three times as likely to die as Non-Hispanic White infants – 14.8 per 1,000 Black babies, compared with 4.9 per 1,000 White babies. [2] These losses mirror the national trend.[3]

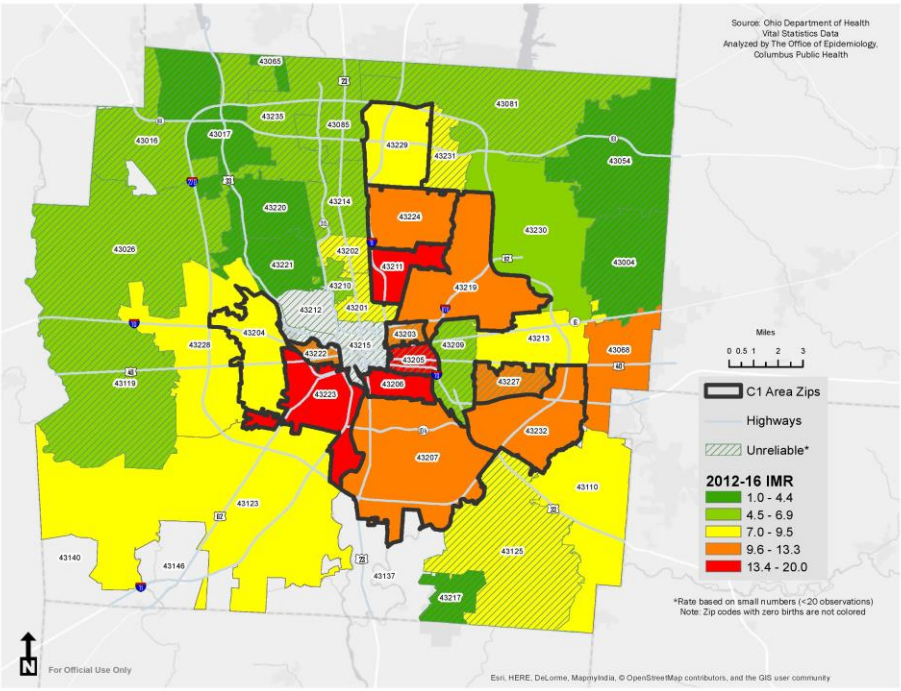
More than Just a Medical Issue

There is no single reason why some infants live to see their first birthday while others do not, nor is there an easy means of combatting this problem. Solutions for reducing fetal and infant mortality and eliminating the disparities which exist in these outcomes must transcend individuals' characteristics and behaviors. A community's transportation systems, availability of affordable housing, and access to healthy foods and health care, among other factors, can either help "protect" women from adverse birth outcomes or increase their "risk" of experiencing them.[4]

Where You Live Matters

Researchers have found that community assets and liabilities, along with the conditions in which people are born, live, learn, work, play and age – otherwise referred to as the social determinants of health – have a significant impact on health outcomes. Health is not something that happens solely in a medical setting. Health is in the air people breathe, the water they drink and the places they live.

***Figure 1*: CelebrateOne High-Priority Neighborhoods**



Franklin County has neighborhoods where homelessness, poor access to nutritious foods, higher rates of crime and unemployment, lower rates of graduation, limited access to health coverage, and late entry into prenatal care contribute to fetal demise, to babies being born too small or too soon, and to infants failing to thrive during their first year of life. Eight areas in Franklin County with the highest rates of infant mortality are deemed infant mortality high-priority neighborhoods. (Each area is exhibited in the map in **Figure 1.**)

CelebrateOne, a collective impact initiative established to improve birth outcomes and reduce disparities in infant mortality, believes ZIP codes should not be a determinant of health. As CelebrateOne works with community leaders, residents and industries to enhance neighborhood social and economic conditions, FIMR has chosen to prioritize cases from the eight high-priority areas highlighted in Figure 1 to enhance the understanding of the life experiences of resident mothers, fathers and families affected by loss.[5]

THE FIMR MODEL

Columbus Public Health's (CPH) Franklin County Fetal-Infant Mortality Review (FIMR) Program is patterned on an evidence-based model originally developed by the National FIMR (NFIMR) Program – a collaborative effort between the American College of Obstetricians and Gynecologists (ACOG) and the Maternal and Child Health Bureau (MCHB) of the Health Resources and Services Administration. NFIMR has since transitioned to the National Center for Fatality Review & Prevention (NCFRP). FIMR processes start with a detailed review of de-identified cases of fetal and infant death by a multidisciplinary Case Review Team (CRT). This group examines the significant social, economic, cultural, safety and health systems' factors associated with fetal and infant mortality and proposes recommendations to support optimal birth outcomes. On an annual basis, the CRT shares its observations with a Community Action Team (CAT) which then determines how best to address barriers to care, gaps in service delivery, and other unmet needs.

Columbus Public Health oversees multiple fetal, infant and child death review processes in Franklin County. However, FIMR is unique in exploring the qualitative (versus quantitative) nature of fetal and infant death, and deeply explores a well-defined subset of fetal and infant deaths (versus broadly describing the circumstances of all fetal and infant deaths in the county). For more information about the differences between FIMR and other child death review models, see **Appendix A**.

CASE SELECTION PROCESS

Guided by Perinatal Periods of Risk (PPOR) analyses, the CelebrateOne high-priority neighborhoods, and vital statistics information, Franklin County FIMR prioritized losses from PPOR "Maternal Health/Prematurity" or "Maternal Care" categories for in-depth review. (See **Appendix B** for more information about PPOR.) By design, cases with known risk factors were prioritized for the purpose of learning more about service system gaps within the community. One bereaved family who did not meet selection criteria, but who asked to participate in a FIMR interview, was also included.

2017 FIMR criteria included the following:

Deaths from either PPOR categories

- "Maternal Health/Prematurity"
  - Fetal death: 500-1499 grams at birth & ≥24 weeks gestation at death
  - Infant death: 500-1499 grams at birth & no minimum gestational age
- "Maternal Care"
  - Fetal death: ≥1500 grams at birth & ≥24 weeks gestation at death

AND, with 3 or more maternal risk factors as reported by the Office of Vital Statistics

- Unmarried
- Less than a high school education/General Equivalency Diploma (GED)
- Birth spacing of less than 18 months
- Previous preterm birth
- Previous poor birth outcome
- Smoked within 3 months of pregnancy or while pregnant
- Teenager (<20 years of age at time of birth)
- Obesity pre-pregnancy (Body Mass Index (BMI) ≥30)
- Enrolled in Women, Infants and Children (WIC) Food and Nutrition Service Program
- Non-Hispanic Black/African American[1]
- Lived in a CelebrateOne high-priority neighborhood (ZIP codes indicated in parentheses)
  - Franklinton (43222, 43223), Hilltop (43204), Morse Rd/161 (43224, 43229), Near East (43203, 43205), South (43206), Northeast (43219), Linden (43211), Southeast (43227, 43232)

[1] FIMR acknowledges Black women's increased risk of poor birth outcomes is due to living as the target of systematic racism, not simply being a person on color.

FAMILY INTERVIEWS

Since the family's voice adds vital insight to each case, the Franklin County FIMR conducted extensive outreach to those affected by fetal or infant loss. Across the country, 78% of all FIMRs seek family interviews as part of their case abstraction process, and among those teams, only 29% of their reviewed cases actually include a family interview.[7] However, of the 48 cases Franklin County FIMR reviewed in year three, 52% of the cases included an interview. Of the remaining 48% of cases, 29% declined to participate (10% "no showed" to a scheduled interview, 8% cancelled a scheduled interview, and 10% explicitly declined an interview) and 19% were unresponsive. While bereaved mothers often elect to participate in the "family interview" alone, these interviews also included 2 grandmothers, 1 same-sex partner, 1 father, 1 sister-in-law and children of all ages. FIMR is grateful for the reflections shared by these families. They illustrate how significantly the social determinants of health can affect birth outcomes.

PREPARATION FOR REVIEW

Once cases were selected, the FIMR staff abstracted all available medical and social service records. FIMR has Memoranda of Understanding (MOU) with *Mount Carmel Health Systems*, *Nationwide Children's Hospital*, *OhioHealth*, *The Ohio State University Wexner Medical Center* and *PrimaryOne Health,* which promote medical records sharing with FIMR. If a family received care from a provider outside of these health systems, FIMR attempted to obtain a "Release of Information" (ROI) from the family to review those records. Whenever applicable, FIMR received a summary from Franklin County Children Services outlining a family's involvement as a perpetrator or victim of violence. Records from the Ohio Department of Rehabilitation and Correction and the Franklin County Municipal Court were reviewed to learn about any legal matters, including outstanding warrants and family incarceration history. If the family had contact with CPH's Home Visiting, Perinatal Hepatitis B or WIC programs, those records were also reviewed.

FIMR integrated the information from the medical and social service records with the details gathered from the family interview, and then de-identified all abstracted information related to the family, decedent, providers and facilities.

CASE REVIEW TEAM (CRT)

The CRT is a multidisciplinary team of experts that meets monthly (a full list of active 2017 CRT members is available in **Appendix C**). It typically reviews three cases at each two-hour meeting. Once per quarter, the CRT split into two smaller teams to review six cases instead of the usual three. The CRT discussed each of the 48 abstracted cases for 30-60 minutes, identified each case's characteristics using a detailed list of present and contributing factor codes adapted from NFIMR's "Present & Contributing Variables" document (see **Appendix D**), and prioritized which variables seemed most influential in the outcome of the case. The group discussion and these codes became the basis of the FIMR findings and recommendations in this report.

COMMUNITY ACTION TEAM (CAT)

The current FIMR CAT is CelebrateOne's Lead Entities Committee, which operates under the accountability structure of the CelebrateOne Board of Directors. All of the annual findings and recommendations are presented to both the CelebrateOne Board of Directors and the Lead Entities Committee. After the 2016 *FIMR Case Review Team Findings: Year Two* report was released, the Lead Entity Committee members were convened to review the findings in greater detail. After a series of meetings, the Lead Entities Committee prioritized the FIMR recommendations based on work presently underway and the potential impact in to reducing the community's infant mortality rate and major causes of infant death. The following FIMR recommendations were identified as priorities:

- Partner with non-traditional providers to help families meet their family planning goals. Potential partners include harm reduction programs to assess family planning needs of substance-using women, pharmacists to administer Depo-Provera outside the traditional OB/GYN setting, and mobile medical units to meet women's family planning needs within their own communities.

- Assess all women's family planning goals and ensure access to a broad selection of postpartum birth control options, including LARC, prior to delivery discharge.
- Assess all women at every prenatal care or other pregnancy support visit for: trauma history, substance abuse, mental health, cognitive ability and health literacy, housing, transportation, food security, and income/employment.
- Increase access to perinatal home visiting.

Additionally, when applicable to their work, each Lead Entities Committee member considered ways to incorporate related activities to the into their 2018 work plans.

In March 2018, Columbus Public Health conducted a survey of infant mortality stakeholders to assess if FIMR recommendations resulted in any changes to our partners' and stakeholders' administrative practices, services, funding, policies, etc. Some of the activities of the Lead Entities referenced above are included in the survey results. For a summary of these findings, see **Appendix E**.

PROFILE OF CASES REVIEWED

FIMR seeks to review all cases that meet selection criteria within a year of the decedent's death. Of the 48 cases reviewed in 2017, 35 deaths occurred in 2016 and 13 were in 2017. On average, FIMR brought cases to CRT 8 months after the date of death.

Table 1 presents a summary of the cases' fetal/infant characteristics. **Table 2** presents a summary of maternal characteristics.

Table 1: Fetal/Infant Characteristics of FIMR Cases Reviewed in 2017

Fetal/Infant Characteristic	% FIMR Fetal Deaths N=34	% FIMR Infant Deaths N=14	% Total FIMR Cases N=48	% Total Franklin County Deaths* N=275
Sex of Fetus/Infant				
Male	50.0	42.9	47.9	52.4
Female	50.0	57.1	52.1	45.5
Unknown	--	--	--	2.2
Plurality				
Singleton	100.0	85.7	95.8	86.5
Multiple Gestations	--	14.3	4.2	9.8
Unknown	--	--	--	3.6
Gestational Age (weeks)				
Extremely preterm (<28)	11.8	64.3	27.1	52.7
Very preterm (28 to <32)	17.6	35.7	22.9	8.0
Moderate/Late preterm (32 to <37)	41.2	--	29.2	14.5
Term (≥37)	29.4	--	20.8	21.8
Unknown	--	--	--	2.9
Birth Weight (grams)				
Extremely low birth weight (<1000)	11.8	85.7	33.3	47.6
Very low birth weight (1000-1499)	23.5	14.3	20.8	8.4
Low birth weight (1500-2499)	26.5	--	18.8	13.5
Normal birth weight (2500-3999)	29.4	--	20.8	19.6
High birth weight (≥4000)	5.9	--	4.2	1.5
Unknown	2.9	--	2.1	9.5

* Data for Franklin County include fetal & infant deaths for year 2016 only. FIMR cases reviewed in 2017 include deaths from years 2016-2017.
Data Source: Vital Statistics, manually entered into FIMR database; analyzed by Office of Epidemiology

Table 2: Maternal Characteristics of FIMR Cases Reviewed in 2017

Maternal Characteristic	% FIMR Fetal Deaths N=34	% FIMR Infant Deaths N=14	% Total FIMR Cases N=48	% Total Franklin County Deaths* N=275
Race/Ethnicity				
Non-Hispanic White	38.2	14.3	31.3	39.6
Non-Hispanic Black/African American	52.9	57.1	54.2	41.8
Non-Hispanic Other	2.9	14.3	6.3	7.3
Hispanic/Latino	5.9	14.3	8.3	7.3
Unknown	--	--	--	4.0
Country of Origin				
U.S.-Born	85.3	64.3	79.2	72.4
Foreign-Born	14.7	28.6	18.8	23.3
Unknown	--	7.1	2.1	4.4
Age Group				
<20	17.6	7.1	14.6	8.4
20-24	29.4	21.4	27.1	20.0
25-29	17.6	42.9	25.0	33.8
30-34	20.6	14.3	18.8	23.3
≥35	14.7	14.3	14.6	12.4
Unknown	--	--	--	2.2
Education				
≤Grade 8	2.9	--	2.1	2.2
Grade 9-12, no diploma	20.6	35.7	25.0	13.8
High School/GED	32.4	21.4	29.2	26.9
Some College	32.4	14.3	27.1	18.5
Associates Degree	5.9	--	4.2	8.0
Bachelors, Masters or Professional Degree	5.9	28.6	12.5	25.1
Unknown	--	--	--	5.5
Pre-Pregnancy Weight				
Underweight (BMI <18.5)	--	7.1	2.1	2.9
Normal Weight (BMI 18.5-24.9)	32.4	21.4	29.2	33.1
Overweight (BMI 25.0-29.9)	11.8	35.7	18.8	26.2
Obese (BMI ≥30)	52.9	28.6	45.8	28.4
Unknown	2.9	7.1	4.2	9.5
Marital Status				
Married	11.8	35.7	18.8	44.0
Unmarried†	88.2	64.3	81.3	53.5
Unknown	--	--	--	2.5
Entry into Prenatal Care				
1st trimester (0-13 weeks GA)	70.6	57.1	66.7	59.6
2nd trimester (14-26 weeks GA)	14.7	14.3	14.6	16.4
3rd trimester (27-40 weeks GA)	2.9	--	2.1	2.9
No prenatal care	--	7.1	2.1	5.1
Unknown	11.8	21.4	14.6	16.0
Primary Method of Payment for Delivery				
Private Insurance	29.4	21.4	27.1	23.3
Medicare	--	--	--	1.5
Medicaid	58.8	78.6	64.6	26.9
Self-Pay/Indigent	11.8	--	8.3	5.8
Unknown	--	--	--	42.5
Other Characteristics				
First Pregnancy	20.6	21.4	20.8	29.0
Previous preterm birth‡	7.7	10.0	8.3	17.8
Previous poor birth outcome‡	19.2	10.0	16.7	20.3
Birth spacing <18 months‡	52.0	66.7	55.9	41.3
Smoked during/within 3 mo. of pregnancy	41.2	53.8	44.7	26.0
Enrolled in WIC with this pregnancy	52.9	61.5	55.3	29.1
Resident of CelebrateOne neighborhood	73.5	64.3	70.8	45.8

* Data for Franklin County include fetal & infant deaths for year 2016 only. FIMR cases reviewed in 2017 include deaths from years 2016-2017.
† Unmarried includes single (never married), divorced and widowed women
‡ Proportions exclude those with first pregnancies and unknown previous outcomes
Data Source: Vital Statistics, manually entered into FIMR database; analyzed by Office of Epidemiology

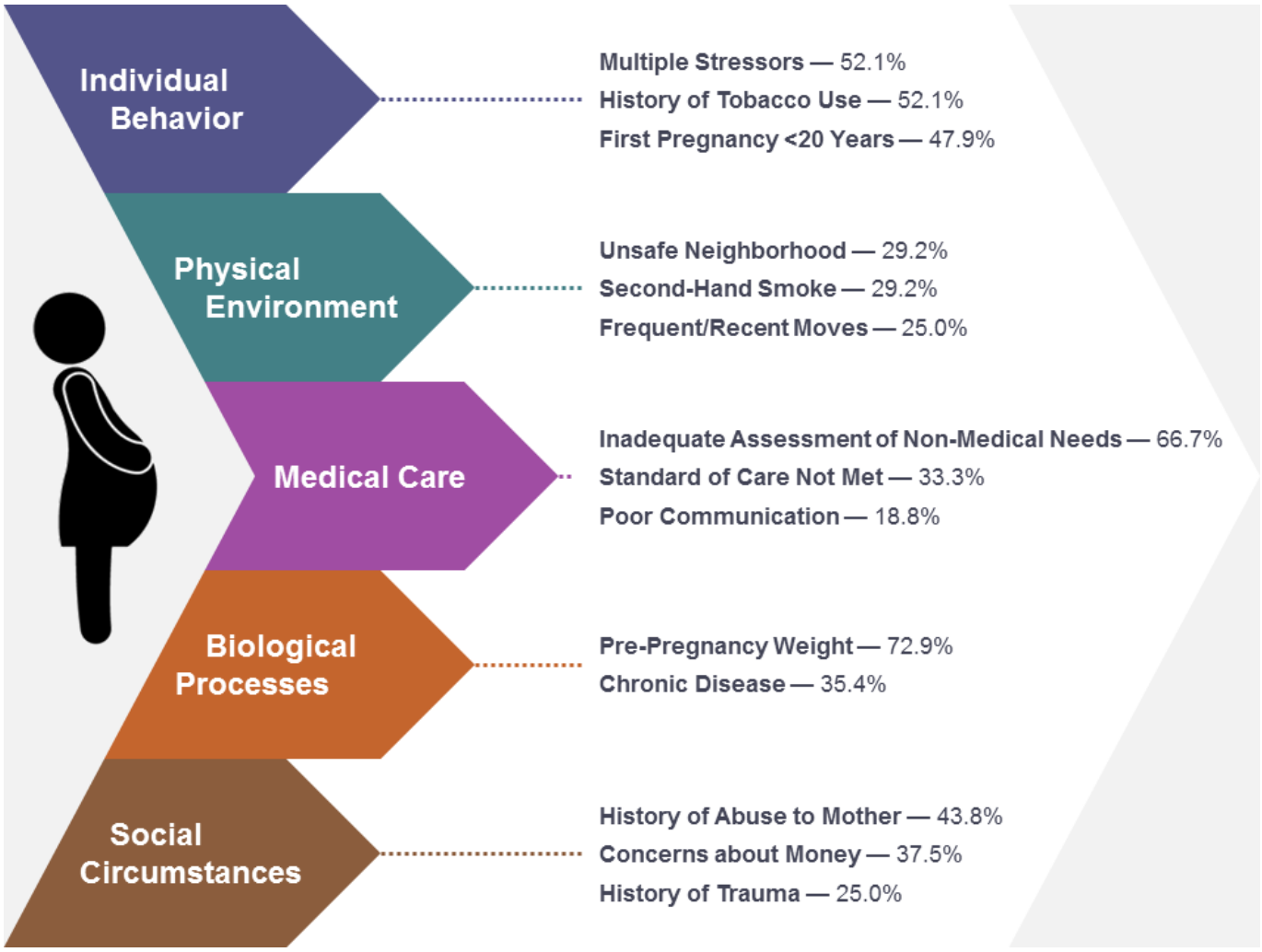
FINDINGS & RECOMMENDATIONS

To analyze case findings, factors from the detailed list of present and contributing factor codes – adapted from NFIMR's "Present & Contributing Variables" document (Appendix C) – were prioritized according to the following: 1) the factor was present in the greatest number of cases; 2) the CRT considered the variable to be a contributing factor in the greatest number of cases; and 3) the CRT deemed the factor to be one of the most significant contributors in the greatest number of cases.

Information and themes identified through family interviews and CRT discussions were reviewed to understand how these variables related to women's real-world experiences with conception, pregnancy, delivery and loss. The CRT's recommendations are based on these findings and are organized in the following sections according to broadly-encompassing social determinants of health categories: individual behavior, physical environment, medical care, biological processes and social circumstances. FIMR acknowledges that the variables impacting maternal-child health outcomes are complex and could fall in more than one category in this model. The intent is not to oversimplify the overlapping nature of the various issues, but to illustrate that medical care is but one of many factors which contributes to fetal and infant mortality.

Figure 3 displays these categories, highlighting the factors that fall into at least two of the three aforementioned prioritization groups (i.e., present, contributing and most significant). Percentages represent the proportion of cases affected by these factors.

Figure 3: Significant Present & Contributing Factors to Fetal/Infant Demise



INDIVIDUAL BEHAVIOR

People are often unable to directly control many of the determinants of health, such as housing, transportation, etc. It is helpful for professionals working with families or pregnant women to understand the individual circumstances for each person in order to provide ideas that increase access to resources and supports that optimize their health outcomes, including those related to pregnancy, birth, and fetal and infant demise.

PROMOTE ACCESS TO AND USE OF EFFECTIVE FAMILY PLANNING METHODS TO AVOID UNINTENDED PREGNANCY

> *"My pregnancy was kind of planned… We had so many problems, but I was blind to that fact. I just still loved him and wanted to be with him. He asked me to have his child. After that, I don't know what happened. He just started going buck wild… It kind of hurt my feelings 'cause I'm young and this wasn't in my plans. I had other plans, but I did this for him. – 20-year old mother*

Of the 48 cases FIMR reviewed, nine pregnancies were known to be intended and 23 were known to be unintended; data on pregnancy intention was not available for the remaining 16 cases. Of the 23 unintended pregnancies, five were also known to be undesired. No contraception was used in 19 of these unintended pregnancies, and there was a lack of knowledge about how to effectively use contraception in the remaining four cases. Seventeen pregnancies were preceded by a short interpregnancy interval (<18 months). Given that Healthy People 2020 aims to increase the proportion of intended pregnancies to 56% and that unintended pregnancy is associated with a greater risk of health and social issues for mom and baby, [8] the CRT viewed access to family planning methods and education as a major need among the cases reviewed.

Relatedly, a total of 28 women in FIMR's sample conceived their first pregnancy at age 19 or younger (of the 28, ages ranged from 12-19 and averaged 16.3 years old). Seven of these women were aged 19 or younger at the time they conceived the decedent. Given that Healthy People 2020 also aims to reduce pregnancies among adolescent females aged 19 and under, [9] the CRT recommends engaging evidence-based strategies to postpone first pregnancy until after age 19. One such strategy could include asking One Key Question® (i.e., "Would you like to become pregnant in the next year?") to women of reproductive age in any setting in which they may receive care or services, and enhancing the awareness and availability of all family planning options.[10]

Reproductive health conversations are certainly encouraged for women of reproductive age, though the CRT noted that reproductive decisions are not always being made by women in isolation. While only nine women in the sample were legally married while pregnant with the decedent, 30 women were identified as having a supportive relationship with a male partner. Therefore, the CRT recommends broadening reproductive life planning conversations and services to include male partners, perhaps by asking an alternative One Key Question® (i.e., "Would you like to become a father in the next year?") to men of reproductive age.

FIMR Recommendations:

- Establish One Key Question® in all medical settings, social service agencies, and anywhere men and women of reproductive age may receive services.
- Enhance opportunities for reproductive life planning conversations between youth and trusted adults in schools and community-based settings.
- Ensure the availability of all family planning methods in all medical settings to promote same-day access.

IMPROVE ASSESSMENT & TREATMENT OF MENTAL HEALTH & SUBSTANCE ABUSE

> *"I'm getting help now for my mental health. Plus, I'm in a drug treatment program… I wasn't on my [mental health] medication for 6 years because my parents told me it was all in my head. So I was self-medicating with drugs… I started smoking about a pack/day when I was 18… [During the pregnancy] I was snorting both heroin and methamphetamine multiple times a day. Part of me felt that if I used a lot, I might get rid of the baby… I never, in a million years, would have thought [I could become an addict]. But it can happen to anyone… I can't believe how much I've destroyed and damaged. Now I'm rebuilding from the ground up… I know there's a lot of mental health and recovery agencies out there, but I think there should be more awareness of what could happen if you're not on your [mental health] meds and using drugs. Mental illness and drug abuse are intertwined." – 33-year-old mother*

Seventeen women reported history of mental illness (ranging from depression to long-term placement in a residential psychiatric treatment facility) and 19 women had a diagnosed mental illness in pregnancy or immediately after delivering the decedent. Diagnoses of current mental illness included: postpartum depression (11), depression (10), anxiety (7), bipolar disorder (6), suicidal ideation or attempt (5), post-traumatic stress disorder (4) and other mood disorders (2).

Of these 19 women, 15 received a mental health assessment and four were noted to have no immediate needs. Of the 11 women with unmet mental health needs in pregnancy, two received a referral for mental health support and 5 completed at least one appointment with a mental health provider. The remaining 4 women received neither referral nor treatment. Of the 29 women with no mental illness noted in their charts, 11 had been asked about their mental health and found to have no needs. However, 18 women were never asked about their mental health needs at any time in their pregnancies.

As stated in the quote above, there has been a noted association between mental illness and substance use, with the coexistence of both a mental health and a substance use disorder referred to as co-occurring disorders. According to the Substance Abuse and Mental Health Services Administration (SAMHSA)'s 2014 National Survey on Drug Use and Health (NSDUH), approximately 7.9 million American adults had co-occurring disorders in 2014.[11] In this same survey, it was estimated that 25.2% (66.9 million) of Americans aged 12 or older were current users of a tobacco product. While use of tobacco has declined since 2002 for the general population, this has not been the case for people with serious mental illness. Tobacco use has been noted as the leading cause of preventable illness and death in the US, and during pregnancy it has been shown to cause additional health problems, including premature birth, certain birth defects and even infant death.[12]

Tobacco use is often self-reported at the time of the first medical assessment. Subsequent assessment of tobacco use varies by provider. In a recent study of smoking before and during pregnancy, 10.9% of women in the U.S. reported smoking in the 3 months prior to conception and 8.4% of women reported smoking during pregnancy; in Ohio these rates were 21.4% and 16.3%, respectively.[13] In Franklin County, 14.3% of women reporting smoking in the 3 months prior to conception and 10.2% reporting smoking during pregnancy.[14] Among FIMR cases the proportion was much higher, with 25 women (53%) reporting smoking during pregnancy. (*Note that tobacco use was a variable used for FIMR case selection due to its known impact on pregnancy.*) Of these women, only six received tobacco cessation education. Five of these six women subsequently decreased their tobacco use while pregnant with the decedent.

Assessment of other drug use is completed by a combination of self-report and drug testing. Of the 48 cases reviewed, 29 women received a drug test at some time in their pregnancy (at delivery (26), prenatal care visit (10), ER (1)) and 13 tested positive for an illicit drug. Of the 19 women who did not receive a drug test, 13 were not verbally assessed for drug use by a provider, five were verbally assessed and reported no drug use, and one was verbally assessed and reported marijuana use. In all, 15 of the 48 women were found to have used at least one type of illicit drug during pregnancy with the decedent (marijuana (11), opiates (3), methamphetamine (3), benzodiazepines (2), oxycodone (1), cocaine (1), non-prescribed methadone (1)); three of these women were polysubstance users. Two infants were tested at delivery; both tested positive for one or more substances. Of note, 70% of women who used an illicit substance also smoked tobacco.

Anecdotal reports from parents indicate that those who are young, single, of color, or poor felt scrutinized about their health behaviors and patterns of drug use. When interviewed by FIMR about their drug testing protocols, providers report testing for illicit drug use under a certain set of circumstances (e.g., young mother, previous positive test, etc.) or if a "red flag" is raised. While drug testing during pregnancy has potential benefits for both women (e.g., referrals and access to treatment) and their infants (e.g., early diagnosis and treatment of withdrawal symptoms at birth), research suggests that women feeling targeted by biased testing take measures to protect themselves from potential consequences of such testing by avoiding or emotionally disengaging from prenatal care.[15]

FIMR Recommendations:

- Establish and promote comprehensive mental health assessments, care coordination, and ongoing support services to curb underassessment and under-treatment of mental illness.
- Increase access to home-based counseling and case management services, especially for those with complex mental health needs and/or multiple life stressors.
- Standardize tobacco and drug use assessment procedures to ensure that testing is completed without bias.
- Enhance supports for women using tobacco and other drugs by increasing access to non-judgmental cessation education, treatment programs, and vigorous follow-up.

PHYSICAL ENVIRONMENT

The social determinants of health reflect both the social and physical conditions of the environment in which people are born, live, learn, play, work and age. Factors in the physical environment that are typically thought of as influential to health include exposure to harmful substances, access to health-related resources (e.g., food, recreation, medical care), and the built environment. Factors in the social environment, however, can be just as, if not more, important to health. Safety, violence, and the type, quality, and stability of social connections in the community can all influence pregnancy and other health outcomes.[16]

IMPROVE ACCESS TO SAFE HOUSING AND DECREASE COMMUNITY VIOLENCE

> *"Growing up without money was difficult, but we were used to it. Sometimes bills can't get paid, so things might get shut off... When I was 16, my family was evicted. At the time, [my older son] was 1-year-old. My family split up and lived with various other family members. I didn't really have anywhere to go. So for a while I dropped [my older son] off with his dad because I was trying to work and take care of him too. I dropped him off for about a month, and then I took him back. We stayed with my friend, but that wasn't the best living situation because they had so many people in the house. They would steal [my older son's] milk whenever I bought him food… That was a stressful time for us." – 20 year old mother*

> *"Our community was ghetto and there was violence all the time, everywhere, but I personally wasn't scared. We lived in a neighborhood with drugs… kids fighting. I fought at school and at home." – 36-year-old mother*

Exposure to violence is an important public health issue. People can be exposed to violence in many ways: they may be victimized directly, witness violence or property crimes in their community or hear about crime and violence from other residents. Women interviewed by FIMR described several issues that made them feel unsafe: unsafe housing (e.g., dilapidated structures, unkempt properties, unresponsive landlords), unsafe practices (e.g., drug use, transactional sex, wrong-way traffic on one-way streets), targeted violence (e.g., violence perpetrated by a known person, domestic violence, violence based on group affiliation) and community violence (e.g., witnessing violence between unknown people, hearing gunshots, helicopters and sirens).

When initially asked about violence, parents frequently denied exposure and reported feeling safe in their neighborhoods. However, during the course of the interview many proceeded to enumerate the unsafe circumstances surrounding them. When asked to reconcile this apparent contradiction, some parents acknowledged they were surrounded by violence but stated they were able to mitigate their exposure by adjusting their own behaviors. For example, one 19-year-old mother said, "People are dying left and right.

They wanna shoot. There's always fights. I'm trying to stack my money so I can get up outta there. I don't want my son growing up in that hostile environment. It's not in our house. It's just the outside, so I don't let [my son] play outside. If he goes outside, it's in the backyard because it's got a 6-foot privacy fence." Other parents, like this 20-year-old mother, downplayed how these exposures affected them: "I do not feel unsafe [in the neighborhood] because there's not really any [community violence] other than shootings that I don't see… I can hear gunshots, but that's typical out here… I've been hearing that ever since I was little, so I know if it's close enough to where I have to get on the ground or if it's far enough and I'm okay."

Other parents, however, did acknowledge the negative impacts of this violence on their lives and shared their desire to move to communities they perceived to be safer. This was the case for a 41-year-old mother who said, "I don't feel safe at all in this neighborhood. That's why I'm looking for something else now. It's too much shooting and dealing [drugs]. There was that boy got shot yesterday in front of my house. I don't let my kids outside. We stay inside. We play games. I put the cartoons on. Then they get mad if I don't let them out… (Turning to her 6 year old, she said) 'I don't want you by the door. You know why? I love you.' I don't want my babies hurt."

Despite the impacts of housing stability, quality and neighborhood safety on health, there were only 33 charts that noted a patient's housing situation. In two of these cases, mothers were "couch-surfing" and asked for help to address an unmet housing need (one reported "living in a drug house," the other reported living in a neighborhood with frequent shootings in an overcrowded apartment that required a wooden barricade to keep the front door closed). However, FIMR interviews revealed that an additional 12 cases actually had one or more unmet housing needs (unsafe neighborhood (11), frequent moves (7), substandard housing (4), overcrowding (1), homeless (1)). In the 15 cases where providers made no note about assessing a family's housing situation, FIMR interviews revealed an additional three cases with unmet housing needs related to homelessness, frequent moves or living in a neighborhood where they felt unsafe.

FIMR Recommendations:

- Implement proven strategic interventions to reduce violence, strengthen public safety, minimize arrest and incarceration, and improve relationships between law enforcement and the communities they serve.[17, 18]
- Standardize assessment of housing needs to ensure women and families are referred for housing supports, as needed.
- Ensure the availability of quality, affordable rental housing, and paths to home ownership for residents in under-resourced communities.

MEDICAL CARE

Access to medical care can greatly impact an individual's health status, but the quality of that care can also have a significant impact on health outcomes. While high cost of services, inadequate insurance coverage, and lack of availability are traditionally considered barriers to medical care that lead to unmet health needs, the quality of the patient-provider relationship is also a key determinant of health, especially during pregnancy.

STRENGTHEN PATIENT-PROVIDER RELATIONSHIPS TO ENHANCE MEDICAL CARE EXPERIENCES

> *"The only problem I have with [prenatal care @ Hospital B] is that we asked to see a high risk doctor because, after losing one child, you definitely don't want to lose another and you know that the risks are even higher… Whenever we did go back, we asked for a high risk doctor. [The provider] said 'Oh, no. There's no reason to have one.' We wanted to be seen more than once a month to make sure my placenta was good, but they said, 'No.'" – 27-year-old mother*

When discussing cases, the CRT frequently asked: "How did this woman fall out of care?" and "Where did we lose her?" Examination of these cases indicated some disruptions were due to problems on the provider-side, like poor coordination between multiple providers leading to gaps in care. Others were due to problems on the patient-side, such as lack of childcare or transportation, work schedule conflicts or difficulty managing a life-

limiting fetal diagnosis. But most often, a woman's engagement in prenatal care was directly related to how invested she felt her providers were in her.

As with all FIMRs patterned on the NFIMR model, the Franklin County FIMR tracked "patient dissatisfaction" in prenatal care, hospital care, pediatric care, and support services. Reports of dissatisfaction with any of these points of care generally emerged through FIMR interviews or social worker notes in the medical chart, often illuminating the rationale for patients' medical decision-making and behaviors. For example, while a medical chart may only note the patient "no showed" to a scheduled visit or was "non-compliant" with a recommended treatment, a FIMR interview may reveal the patient had a negative experience with the provider in a previous encounter which impacted her ability or willingness to engage in her care in the way the provider would have preferred or expected. In all, 24 families expressed dissatisfaction in one or more care settings (prenatal care (14), hospital care (11), pediatric care (1), support services (6)). In the bulk of these cases, families attributed their dissatisfaction, at least in part, to a problem in the communication or relationship between the patient and provider.

Dissatisfied patients described feeling "not believed," "neglected," "rushed," "not listened to," "pressured" and "lectured," all of which impacted patients' willingness to follow medical recommendations. One 23-year-old mother described the impact of her poor patient-provider relationship on her pregnancy: "The doctor put me on a baby aspirin, but I quit taking that. He never told me why he put me on that… I never knew about kick counts. I knew nothing… Our doctor would rush us in and out of appointments… I would try to explain [my symptoms] to him, and he wouldn't listen to me. He would kind of brush everything off we asked about… At one point in time, I actually thought I might have had preeclampsia and I asked him to test me for it and he wouldn't. My blood pressure was high throughout my whole pregnancy. My face, my hands, my ankles all the way up to my calves would swell. I had severe headaches. My stomach would hurt really bad. And he wouldn't check me for it… even [when] I asked him."

Sometimes poor patient-provider relationship or communication impacted patients' attendance at medical appointments. "Missed medical appointment" was noted in 20 of the 48 cases reviewed, and in half of these cases, mothers cited a relationship or communication problem with the provider as a variable in their attendance. Missed medical appointments not only disrupt continuity of care for the individual patient, but also impact the system as a whole, diverting staff time from providing care to rescheduling appointments, and consuming a time slot that could have been used for another patient's care.

Perhaps related, FIMR found that 27 women delayed contacting a provider after the onset of a concerning symptom, most often a decrease in fetal movement (decreased fetal movement (22), leaking fluid (2), vaginal bleeding (1), abdominal pain (1), signs of pre-eclampsia (1)). On average, women who noticed a decrease in fetal movement waited 48 hours before seeking care (range 5 hours-168 hours). While prenatal fetal kick count education was documented in a total of 18 cases, only 5 of the 22 women who delayed seeking care after this decrease in movement had received kick count education. Several women who received this education reported they were "handed a book… [but] would rather have had someone go over it." Nine of the women who delayed seeking care also explicitly reported dissatisfaction with their prenatal care. All of this points to the importance of not only standardizing kick count education, but making that education more patient-friendly, and the importance of nurturing a healthy patient-provider relationship.

To support the development of a healthy patient-provider relationship, families consistently reported a desire to see one provider throughout pregnancy rather than being "passed around." They reported wanting to feel less rushed during appointments, to have their questions answered, and to trust that they were receiving optimal care regardless of their primary language, zip code, income or race. As the partner of one mother on Medicaid put it, "I think insurance has a lot to do with [his death]. We aren't on a good insurance plan; we're poor. I think they take better care of people with great insurance… who aren't on welfare." When a strong patient-provider relationship was established, families talked at length about the positive impact it had on their experience, despite the poor birth outcome. For example, one 44-year-old mother said, "My specialist doctor was very helpful. She spent like a half hour breaking it all down for us. She sat there and didn't rush. I was in a panic and she broke it down. That education is helpful so you can truly make the decisions. We knew what

we were up against then. It was pretty serious. They gave me all my options. Every move they made was my choice. They made sure it was my choice."

Part of developing a strong patient-provider relationship, however, depends on the willingness of the provider to assess for important non-medical aspects of the patient's life and to make room for the patient to disclose this important information. When FIMR reviewed patient charts, these non-medical needs, if noted at all, were often documented as part of the intake process, not as part of the medical visit. Of the 48 cases, only 16 were assessed for transportation, housing and income security – variables that play a huge role in the health of pregnant women and their ability to participate with recommended care. Of the other 32 cases, 25 were not assessed for income security, 23 were not assessed for transportation problems, and 15 were not assessed for housing problems. FIMR interviews revealed that three of these under-assessed women actually had transportation problems, three had housing problems, and 17 had either a concern about money (11 women) or a work/employment problem (11 women). This inadequate assessment of non-medical needs also contributed to missed opportunities to make a social work, case management, or home visiting referrals in 10 cases.

It should be noted that in the majority of cases, women did receive high quality medical care. However, in 16 cases, the CRT noted one or more well-established standards of care were unmet in either the prenatal period or at delivery. In 12 cases, this standard involved problems with the timing of care or other negligence, including long gaps in prenatal care with no contact attempts by the provider, failing to conduct critical tests, conducting tests at the wrong time in pregnancy, or, in one case, allowing a woman with a prolapsed cord to labor at length instead of taking her for C-section. In seven cases, the unmet standard of care involved inadequate assessment of fetal well-being or growth. While most of these unmet standards of care did not directly cause the decedent's death in and of themselves, these lapses did lead to a dearth of critical knowledge that may have led to alternate recommendations about the course of treatment, and potentially improved birth outcomes.

FIMR Recommendations:

- Align medical culture and reimbursement practices to prioritize holistic assessment and referral, patient education and positive patient-provider relationships as part of a patient-centered model of care.
- Enhance the availability of pregnancy/postpartum doulas, community health workers and home visitors to optimize women's engagement in care, teach self-advocacy and advocate on the patient's behalf.
- Offer providers continuing education opportunities to learn, practice and enhance health care 'soft

BIOLOGICAL PROCESSES

Many factors interact to affect the health of individuals and communities, including people's individual characteristics, genetic predispositions and biological processes. While chronic conditions, such as obesity, diabetes and hypertension certainly have biological components, to a large extent, these health outcomes are influenced by the context of people's lives (e.g., the state of the environment, income, education and availability and affordability of healthy foods). For women of reproductive age, the aforementioned chronic conditions have been noted not only to affect general health, but birth outcomes as well.[19]

SUPPORT OPPORTUNITIES FOR OPTIMAL HEALTH BEFORE PREGNANCY

> *"The government tells me I make too much [to get assistance]… It's been like that for years. [My 14-year-old daughter] hasn't had insurance in years because I just can't afford it… I don't know what I'm going to do if I don't get Title XX [childcare subsidy for my current pregnancy]. Childcare is more than rent… If anything suffers, it's the food… By the end of the week… we don't even have money for groceries." – 32-year-old mother*

"When I'm pregnant, I eat whatever, whenever… I know there's healthy foods for being pregnant, but I don't really choose that. I choose like donuts, and chips, and you know... whatever I'm in the mood for… I like [fast food]." – 19-year-old mother

As stated, chronic conditions such as obesity, diabetes, and hypertension result from the interplay of biology, diet, health behavior, social-cultural factors, economic determinants and the built environment, including neighborhood walkability and access to healthy food choices. While in lower-income countries people with higher socioeconomic status are more likely to be obese, in high-income countries like the U.S., the opposite is true.[20] Obesity is particularly high in environments with easy access to cheap, high-caloric food (e.g., fast food, convenience store food) and a sedentary lifestyle.[21] Chronic stress has also been associated with the development of obesity.[22] One 35-year-old mother described the connection between stress level and physical health when she said, "I don't want to cry around [my older children]. I don't want to give them life sadness, so I take it in. Sometimes the stresses show in my body. When the body, the heart and brain are not happy, you become bigger size."

Obesity during pregnancy increases the mother's risk of gestational diabetes, preeclampsia, miscarriage, stillbirth, and preterm birth, and the baby's risk of macrosomia and birth defects. It can also make it more difficult for a provider to accurately assess fetal anatomy and well-being. ACOG recommends the best way to decrease the risk of problems caused by obesity is for overweight and obese women to lose weight before becoming pregnant. Losing even a small amount of weight (5-7% of a woman's current weight) can improve overall health and improve the opportunities for a healthier pregnancy.[23]

Knowing that obesity can negatively impact pregnancy and birth outcomes, FIMR used pre-pregnancy body mass index (BMI) of 30 or greater as one of the 11 variables used to select cases for FIMR review. Among the cases reviewed, 1 woman was "underweight" pre-pregnancy (BMI≤18.4), 13 were "normal" weight (BMI 18.5-24.9), 9 were "overweight" (BMI 25-29.9), 24 were "obese" (BMI ≥30), and 1 was "unknown." FIMR's sample also had 8 women with pre-existing hypertension, 5 with pre-existing diabetes and 12 with a history of some other chronic disease (e.g., asthma, GERD, thyroid problems). Ironically, women who were classified as "obese" were less likely than women in any other BMI category to have received counseling on diet or exercise during their pregnancy. Though not definitive, the CRT thought this was due, in part, to the fact that over one-third of the "obese" women had another chronic illness that was prioritized over weight management during pregnancy.

While biological factors predisposing a person to obesity may be difficult to change, the built environment can be designed to make the healthiest choice the easiest choice. This includes increasing access to recreational opportunities in high-need communities; improving the walkability, bikeability and general street safety in neighborhoods; ensuring that families have access to healthy, low-cost foods through WIC or others avenues; and addressing factors which contribute to chronic stress. While all women should receive education and support in pregnancy to obtain or maintain a healthy weight and control pre-existing chronic illness, waiting until a woman is pregnant to address these issues is a missed opportunity. As one member of FIMR's CRT put it, "The best time to start prenatal care is *before* a woman is pregnant." Therefore, the CRT recommends developing systems-level community-wide interventions to decrease obesity and chronic illness, in addition to interventions that address individual behaviors.

FIMR Recommendations:

- Invest in community designs that promote health, including those that increase access to recreational opportunities; improve neighborhood walkability, bikeability and general street safety; and enhance access to healthy, low-cost foods.
- Implement Chronic Disease Self-Management Programs to help both men and women of reproductive age manage their symptoms, improve their quality of life, reduce health care costs and ultimately improve birth outcomes.
- Provide education and counseling on diet, exercise and weight gain during pregnancy for women of all BMI classifications.

SOCIAL CIRCUMSTANCES

People's social circumstances, including encounters of discrimination and racial segregation, quality and availability of social supports, and experiences with poverty and other major stressors can be greatly influential to health.[24] One may argue that these social circumstances underlie each of the other social determinants of health categories, influencing at a primary level people's individual choices and behaviors, existence within their physical environment, access to and experiences with medical care, and even their body's ability to deal with stress. For women, psychosocial stress during pregnancy has been shown to contribute to poor birth outcomes.[25]

LAYER SUPPORTS FOR FAMILIES EXPERIENCING TRAUMA AND MULTIPLE STRESSORS

> *"I was stressed out throughout my whole pregnancy 'cause [the father and] I broke up when I was 2 months pregnant. I was going through heartbreak for the whole entire time and doing everything by myself… I don't know if that was triggering me losing her because I was so unhappy… It was stressful not working. Just not having any money and depending on my mom… So I'm stressing myself out because I'm stressing [my mom] out. And, of course, she was not happy when I told her I was pregnant." – 20-year-old mother*

In addition to neighborhood violence, mothers reported high rates of family or intimate partner violence. While six mothers reported being the victim of physical abuse during their pregnancy with the decedent, 23 mothers reported surviving past physical, sexual, or emotional abuse (domestic abuse by an intimate partner as a teen (11), physical abuse by a caregiver (10), sexual abuse by a caregiver (10), neglect by a caregiver (8), emotional abuse by a caregiver (4)). During their childhood, three of these women had been placed in foster care as a result of the abuse and two more had received "family preservation services." Some women reported running away during their youth as a means of coping with the abuse; five women in the FIMR sample actually indicated that they had experienced childhood homelessness. Each of these childhood experiences is made more complex when layered with chronic poverty. Nationally, economic hardship has been reported as the most common adverse childhood experience;[26] 13 women in the FIMR sample reported not having their basic material needs met as children.

Of the 48 families in the FIMR sample, 25 reported struggling with "multiple stressors," and for 8 of these cases, "multiple stressors" was noted by the CRT as a top contributor to the fetal or infant death. Stressors included, but were not limited to:

- The pregnancy with the decedent
- Relationship strain with father of decedent or extended family
- Employment/financial problems
- Domestic violence/neighborhood violence
- Housing quality and stability
- Medical care
- Maternal mental/physical health
- Parenting children with special needs/losing a child to foster care
- Immigration status
- Transportation
- Hunger

Alone, adverse childhood experiences have been strongly related to the development and prevalence of a wide range of health problems throughout a person's lifespan, but the combination of surviving various forms of trauma (e.g., domestic violence, violent death of a parent, war, etc.) and currently living with multiple stressors impacts both women's health and their engagement with healthcare systems. Women reported current and past events made them feel vulnerable, angry, hyper-vigilant, paralyzed, or isolated. However, these critical experiences and stressors were rarely documented by providers. On occasion, women disclosed these factors at a time of crisis when a mother met with a social worker, who documented her struggles, but generally they were not part of the medical record and were revealed during the FIMR interview. This suggests that families like those reviewed by FIMR underreport traumatic life course factors and the full burden of stressors they carry.

FIMR Recommendations:

- Assess all women for a history of trauma at all points of care.
- Screen all women for domestic violence at every care visit, regardless of whether previous safety assessments have been negative.
- Provide education and referral for support services, as needed, for all families, especially those experiencing multiple stressors.
- Partner with the CARE Coalition or other trauma-focused initiatives to understand the needs of communities burdened by trauma, improve community resilience, and enhance the reach of Trauma Informed Care trainings.

CONGENITAL SYPHILIS: A PARALLEL REVIEW

Untreated syphilis is a large public health threat with risk of damaging side effects and in some cases even death. Franklin County is in the midst of a syphilis outbreak with an 80% increase in infections over the last five-year period. Congenital syphilis—when a mother with syphilis passes the infection to her baby during pregnancy—is also on the rise in Franklin County. It can have major health impacts on the baby including neurological issues, meningitis, enlarged liver and spleen, deformed bones, severe anemia, prematurity, miscarriage, stillbirth, or low birth weight. The Centers for Disease Control and Prevention (CDC) recommends routine screenings at the first prenatal visit, at 28 weeks gestation and again at delivery. With proper screenings and treatment, congenital syphilis is preventable.

In order to thwart the rise in congenital syphilis, CPH and its partners have already implemented a physician education project to increase awareness of syphilis risks and the CDC guidelines for pregnant women. However, in 2018 it will establish a FIMR-like review of all Franklin County congenital syphilis cases born in 2018. The congenital syphilis review will fall outside of the scope of FIMR, but the Franklin County FIMR will support this emerging program by monitoring all FIMR cases for syphilis testing per the CDC recommended guidelines and sharing this information with the new review team.

For more about syphilis in Franklin County, refer to Columbus Public Health's Syphilis Outbreak Reports: https://www.columbus.gov/publichealth/programs/Office-of-Epidemiology/Sexually-Transmitted-Infections/.

IN CLOSING

The in-depth FIMR review of 48 cases of fetal and infant death to "at risk" Franklin County residents in 2017 uncovered trends and insights which may lead to improved systems of care for families, and hopefully, a lower rate of fetal and infant mortality in the future.

The findings of this report indicate several take-homes for providers related to broadening the scope of factors considered within the bounds of medical assessment and developing protocols to reduce bias and ensure wholistic care. This report also suggests that people of reproductive age can improve their birth outcomes by ensuring their pregnancies are planned, proactively managing obesity and chronic illness, disclosing current and historic non-medical concerns to providers, and utilizing mental health and addiction services. Ultimately, however, FIMR finds that policy makers, public health departments, social service providers, and community advocates must work together to cultivate neighborhoods that promote all aspects of individual and community health across the lifespan so that people of reproductive age will be in a position to make the choices that best serve them and their children.

The FIMR CAT should consider these recommendations for future program planning and action.

APPENDIX A: CPH DEATH REVIEWS

Columbus Public Health

Death Reviews

Columbus Public Health oversees multiple death review processes of infants and children in Franklin County, including the Fetal-Infant Mortality, Sudden Unexpected Infant Death, and Child Fatality reviews. The graph below shows how the reviews relate to one another and community data on child deaths.

Death (Mortality) Data Categories

Fetal Mortality

~130 deaths per year

- Includes all fetal losses 20 weeks gestation-birth
- Includes voluntarily reported fetal losses <20 weeks gestation

Infant Mortality

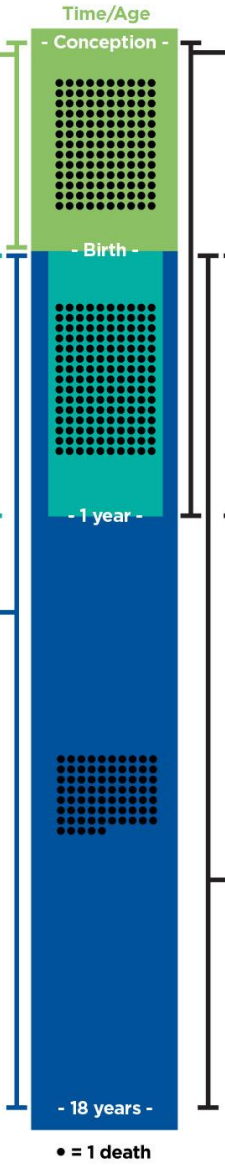
~150 deaths per year

- First breath to 364 days
- Includes **Sudden Unexpected Infant Deaths (SUID)** ~ 25 deaths per year

Child Mortality

~225 deaths per year

- First breath to 17 years and 364 days
- Includes infant mortality



Death Review Processes

The Franklin County Fetal-Infant Mortality Review (FIMR)

Includes Fetal & Infant Mortality Data (typically 20 weeks gestation to 364 days after birth)

An action-oriented quality improvement process that assesses, monitors and works to improve service systems and community resources for women, infants and families. Research shows FIMR is an effective perinatal systems intervention. The FIMR Case Review Team (CRT) reviews a **subset of the roughly 280 cases of fetal and infant deaths** and shares its findings with the Community Action Team (CAT) annually for intervention planning and implementation.

**Fetal deaths are not included in the Franklin County Infant Mortality Rate.*

The Sudden Unexpected Infant Death (SUID) Review

Includes Sudden and Unexpected Infant Deaths (first breath to 364 days after birth)

A subcommittee of the Franklin County Child Fatality Review (FCCFR) that reviews, analyzes and reports on all **deaths of infants less than 1 year of age that occur suddenly and unexpectedly,** and whose cause of death is not immediately obvious before investigation. Most SUIDs are reported as one of three types: Sudden Infant Death Syndrome (SIDS); Accidental Suffocation or Strangulation in Bed (ASSB); or unknown cause. **All sleep-related infant deaths are reviewed by the SUID Review.**

The Franklin County Child Fatality Review (FCCFR)

Includes Child Deaths (first breath to 17 years & 364 days)

An ongoing community planning process in which a team of community experts from various systems and agencies convenes to review, analyze and report on the circumstances around the **deaths of children under 18 years of age**. The mission is to reduce the incidence of preventable child deaths. The FCCFR reviews all cases of infant deaths and SUIDs, but does not review fetal deaths.

5/19/2017

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APPENDIX B: PERINATAL PERIODS OF RISK

Perinatal Periods of Risk (PPOR)[6]

Perinatal Periods of Risk (PPOR) is a comprehensive approach designed to help urban communities across the U.S. use local data to reduce fetal and infant mortality. The initial analysis divides fetal and infant deaths into four "Perinatal Periods of Risk" based on birth weight and age at death (**Figure 2**). Because causes of death tend to be similar in each period, when a community finds that its problems lie in only one or two periods of risk, efforts can be focused on interventions to address needs in those periods. A mortality rate is calculated for each period to allow for comparisons of populations within and between jurisdictions and to examine temporal trends in fetal and infant death.

PPOR analyses build data capacity, promote evidence-based decision making, strengthen partnerships, help leverage resources and enable systems changes. Urban communities across the U.S., including Columbus, use PPOR as a way to monitor progress in fetal and infant mortality reduction, to guide public health planning and to prioritize prevention activities, including FIMR case selection.

Figure 2: Perinatal Periods of Risk (PPOR) Model

Birth Weight	*Age at Death*		
	Fetal ≥24 Weeks Gestation	**Neonatal** 0-27 Days	**Post-Neonatal** 28-364 Days
500 – 1499 grams	**Maternal Health/Prematurity** Chronic Disease Prevention Health Behavior Change Perinatal Care		
≥1500 grams	**Maternal Care** Prenatal Care High Risk Referral Obstetric Care	**Newborn Care** Perinatal Management Neonatal Care Pediatric Surgery	**Infant Health** Safe Sleep Injury Prevention Infection Prevention

In 2017, Franklin County FIMR determined the PPOR category of each case based on information located on birth summaries, death certificates, and fetal death reports (for deaths ≥20 weeks gestation). Data for fetal deaths that occur before 20 weeks gestation is often unavailable.

APPENDIX C: ACTIVE CRT MEMBERS IN 2017

Name	Title*	Organization*
Diane Anderson, RN, Th.M	Women's Chaplain	Grant Medical Center
Jada Brady	Policy Management Analyst	Franklin County Department of Job & Family Services
Renee Burrier	Case Management Supervisor	Franklin County Jobs and Family Services
Rochelle Chambliss, CLS, DTR	Dietetic Technician, Registered	Women, Infants & Children
Lindsay Ciavarelli, MS	Project Director, My Baby & Me	Columbus Public Health
Sheryl Clinger	Director of Advocacy/Policy and Community Engagement	The Center for Family Safety and Healing
Shalana Daley, RD, LD, CLS	Dietician Supervisor & Certified Lactation Specialist	Women, Infants & Children
Brian Ellair, RHIT	Health Information Technician (HIT)	Columbus Public Health
Jennifer Fears-Volley, LISW-S	Maternal Mental Health Clinical Program Director	Catholic Social Services
Raquel Fuentes	Program Manager	CelebrateOne
Tonya Fulwider	Program Director MHAFC and Founder of Perinatal Outreach and Encouragement for Moms (POEM)	Mental Health America Franklin County
Pat Gabbe, MD, MPH	Clinical Professor, Pediatrics Director, Moms2B	Nationwide Children's Hospital OSU Wexner Medical Center
Jay Iams, MD	Obstetrics & Gynecology and Maternal & Fetal Medicine	Ohio Perinatal Quality Collaborative and OSU Wexner Medical Center
Marianne Marinelli, MSN, RNC, CLC	Women's Health Outcome Manager	Grant Medical Center
Arnitta Mason	Supervisor	Franklin County Jobs and Family Services
Octavia Mercado	Supportive Service Liaison	Columbus Metropolitan Housing Authority
Sonia Murphy, RD, LD, MFCS, CLS, MCTMB	Dietician Supervisor & Certified Lactation Specialist	Women, Infants & Children
Rev.Shawn Morris, MDiv	NICU/Bereavement Chaplain	Nationwide Children's Hospital
Apurwa Naik, MD	Neonatologist	Central Ohio Newborn Medicine
Marc Parnes, MD	Retired Obstetrician-Gynecologist	Previously worked at Riverside & St. Ann's
Lauren Rose-Cohen, RN	FIMR Coordinator	Columbus Public Health
Katherine Schiraldi	Associate Director at Intake & Assessments	Franklin County Children Services
Janet Taylor, LSW, CPS,CLC	Social Worker, My Baby & Me	Columbus Public Health
Cynthia Ward, LISW-S	Social Worker, Wellness on Wheels	OhioHealth
Stacie Williamson, RN	Supervisor, Children with Medical Handicaps Program	Franklin County Public Health
Amanda Zabala, MPH	Epidemiologist	Columbus Public Health

*Denotes CRT members' titles and organizational affiliations at the time of their CRT involvement.

APPENDIX D: PRESENT & CONTRIBUTING FACTORS

Each of these variables is from the detailed list of present and contributing factor codes, adapted from NFIMR's "Present & Contributing Variables" document. Numbers represent the cases in which the factor was present. Note: some variables may be underreported due to missing information in available records.

1. Preconception/Interconception Care

4	Preconception care
31	Postpartum visit kept
25	Pregnancy planning/BC education
3	Dental/oral care
6	Chronic disease control education
1	Weight management/dietician
45	Bereavement referral (includes referral for hospital chaplain at delivery)

2. Medical: Mother

7	Teen pregnancy (≤19)
6	Pregnancy > 35 years
12	Cord problem
7	Placental abruption
0	Placenta previa
8	Chorioamnionitis
5	Preexisting diabetes
1	Gestational diabetes
2	Incompetent cervix
9	Infection—bacterial vaginosis
11	Infection—STI: _____
17	Infection—other: _____
2	Multiple gestation
35	Weight pre-pregnancy (BMI <18.5 or >25)
7	Insufficient/excess weight gain
4	Poor nutrition
8	Pre-existing hypertension
2	Pregnancy induced hypertension: pre-eclampsia/eclampsia
14	Preterm labor
17*	Pregnancy <18 months apart
5	PROM/PPROM/prolonged rupture of membrane
8	Dental/oral issues
16*	Previous voluntary termination of pregnancy
15*	Previous spontaneous abortion
10	Oligohydramnios/polyhydramnios
2*	Previous fetal loss
3*	Previous infant loss
4*	Previous low birth weight delivery
7*	Previous preterm delivery
5*	Previous C-section: #_____
1*	Previous ectopic pregnancy: #_____
20	First pregnancy ≤19
11	≥8 Live births
1	Assisted reproductive technology

3. Family Planning

9	Intended pregnancy
23	Unintended pregnancy
5	Unwanted pregnancy
34	No birth control
2	Failed contraceptive
4	Lack of knowledge: methods
0	Lack of resources

4. Substance Use

13	Positive drug test
19	No drug test
25	Tobacco use: history
22	Tobacco use: current
18	Alcohol use: history
8	Alcohol use: current
15	Illicit drug use: current—Type:
14	Illicit drug use: history—Type:
2	Use of unprescribed meds—Type:
2	Over the counter drug/prescription:

5. Prenatal Care/Delivery

16	Standard of care not met
9	Inadequate assessment
3	No prenatal care
11	Late entry to prenatal care
16	Lack of referrals
21	Missed appointments
5	Multiple providers/sites
5	Lack of dental care
6	Inappropriate use of ER: #_____

6. Medical: Fetal/Infant

3	Non-viable fetus
9	Low birth weight <2500 g
14	Very low birth weight <1500 g
13	Extremely low birth weight <750 g
6	Intrauterine growth restriction
5	Congenital anomaly
13^	Prematurity (excludes induced labors)
2^	Infection/sepsis
1^	Failure to thrive
0^	Birth injury
1^	Feeding problem
5^	Respiratory distress syndrome
0^	Developmental delay
1^	Inappropriate level of care
2^	Positive drug test

7. Pediatric Care

1^	Standard of care not met
1^	Inadequate assessment
0^	No pediatric care
0^	Lack of referrals
1^	Missed appointments/immunizations
0^	Multiple providers/sites
0^	Inappropriate use of ER

8. Environment

14	Unsafe neighborhood
6	Substandard housing

2	Overcrowding
14	Secondhand smoke
1^	Little/no breastfeeding
0^	Improper or no car seat use
0^	Unsafe sleep location
0^	Infant overheating
0^	Not back sleep positioning
0^	Apnea monitor misuse
0^	Lack of adult supervision

9. Injuries

0	Motor vehicle occupant
0	Abusive head trauma

10. Social support

8	Lack of family support
11	Lack of neighbor/community support
18	Lack of partner/FOB support
9	Single parent
2	Living alone
13	≤12th grade education/no GED
1	Special education
8	Physical or cognitive disability

11. Partner/FOB/Caregivers

26	FOB Employed
2	History of mental illness
14	Substance/tob use/abuse: current
13	Substance/tob use/abuse: history

12. Family Transition

12	Frequent/recent moves
4	Living in a shelter/homeless
1	Concerns regarding citizenship
7	Divorce/separation
1	Multiple partners
2	MOB: prison/parole/probation
5	FOB: prison/parole/probation
6	Major illness/death in family

13. Maternal Mental Health/ Stress

18	History of mental illness
19	Depression/mental illness postpartum
25	Multiple stresses
5	Social chaos
38	MOB employed
18	Concern about enough money
14	Work/employment problems
1	Child/children with special needs
6	Problems with family/relatives
17	Lack of grief support

14. Family Violence/Neglect

23	History of abuse to MOB
6	Current abuse to MOB
2	History of abuse—decedent
4	History of abuse—other child
1	Current child abuse—decedent
0	Current child abuse—other child
1	History of child neglect—decedent
4	History of child neglect—other child
11	Multiple CPS referrals (MOB or FOB)
17	Multiple police reports (MOB or FOB)

15. Culture

5	Language barriers
0	Beliefs regarding pregnancy/health

16. Payment for Care

12	Private
0	Medicare
36	Medicaid
6	Self-pay/medically indigent

17. Services Provided

26	WIC
3	Mother/child not eligible
1	Poor provider communication
15	Client dissatisfaction—prenatal
11	Client dissatisfaction—hospital
1	Client dissatisfaction—pediatric
6	Dissatisfaction—support services
3	Lack of child care

18. Transportation

0	No public transportation
8	Inadequate/unreliable

19. Documentation

5	Inconsistent unclear information
10	Inconsistent vital records data
0	Missing data
0	No death scene investigation
0	No doll reenactment

20. Added variables

7	History of homeless as a child
8	History of neglect as a child
6	Not engaged in needed MH service
34	Inadequate assm't of non-medical needs
0	No placental pathology
2	Lack of referrals for known lethal condition
5	Inflexible/ineffective prenatal education
13	History of trauma
6	Declined social service(s): _____
1	Delivery outside hospital
28	No autopsy
12	History of other chronic disease
1	Tried but unable to follow med. advice
6	No domestic violence screening
27	MOB did not seek timely medical care
2	Cultural barriers
3	Possible un-dx mental illness
33	No postpartum birth control
3	Impact of racism
1	"Clinic culture"
9	Poor pt-provider relationship or communication
7	Inadequate coordination of care
7	MOB declined recommended care

All cases out of 48 unless otherwise noted (i.e., the full sample)

**Indicates a denominator of 36 (i.e., cases with known previous pregnancy)*
^Indicates a denominator of 14 (i.e., all infant deaths)

APPENDIX E: CHANGES IN MATERNAL & CHILD HEALTH PRACTICE, FRANKLIN COUNTY

In the 2016 *FIMR Case Review Team Findings: Year Two* report, FIMR made specific recommendations to promote and enhance the preconception, pregnancy, and postpartum health of Columbus residents. Since then, there have been a number of implemented changes to maternal, child, family, and community health among local partners. Changes include the establishment of new policy, altered program or business practices, application or receipt of additional funding, development or offering of new or additional services, and enhanced promotion of currently offered services.

While changes in the community may not be a direct result of the FIMR recommendations, the following table highlights the changes in local Maternal & Child Health practice, which align with the 2016 *FIMR Case Review Team Findings: Year Two* report that were reported on FIMR's infant mortality stakeholder's survey in March 2018.

FIMR Year 2 Preconception-Related Recommendation	
• Promote access to and use of effective birth control to avoid unintended pregnancy.	
Organization / Program Name	**Relevant Changes in Practice or Policy**
Columbus Urban League *African American Male Initiative*	– Developed programming as a result of current trend data
Fly Barber Lyfe Foundation *Infant Mortality Grief Services*	– Applied for funding to continue a reproductive health education series, which is administered through community salons and barbershops in high-risk areas – Applied for additional funding for incentives to pay community participants who attend a 13-week nurturing fatherhood program – Expanded partnerships with community agencies that service high-risk populations
March of Dimes *Maternal & Child Health*	– LARC provisions per Senate Bill 332
Nationwide Children's Hospital *Ohio Better Birth Outcomes Collaborative*	– Implemented a reproductive health education and contraception access program to women in substance abuse treatment program(s) – Provided Motivational Interviewing and Contraceptive Counseling training to a variety of professionals working with women of child bearing age
Columbus Public Health *Women's Health & Wellness Center*	– Implemented a reproductive health education and contraception access program to women in substance abuse treatment program(s)
The Center for Healthy Families *Healthy Families Collaborative*	– Trained all direct staff in contraceptive counseling – Engaged all program participants at every appointment in contraceptive counseling – Scheduled participants who chose a method of birth control to receive it same-day or as soon as possible
CelebrateOne *Community Connector Corps*	– Enlisted content experts through the Ohio Better Birth Outcomes Collaborative and Columbus Public Health to train Community Health Workers on birth control options and how to discuss the benefits of family planning with women in the community
CelebrateOne *Teen Reproductive Life Plan*	– Finalized, printed and distributed Teen Life Plans to help young women and men plan their futures and avoid unintended teen pregnancy.
CelebrateOne	– Created a Memorandum of Understanding (MOU) with Columbus City Schools to improve teen health education (e.g., guiding principles with an assertion to deliver education, programs and partnerships related to life choices/planning, dating violence, substance abuse and empowerment)

FIMR Year 2 Pregnancy-Related Recommendations	
• Repeatedly assess pregnant women's non-medical needs (e.g., housing, transportation, income) • Layer supports for pregnant women living with multiple stressors (e.g., home visiting, social service referrals, etc.) • Standardize fetal "kick-count" education • Discuss postpartum birth control (PPBC), including tubal ligation, by the 24th week in pregnancy • Conduct ongoing wholistic assessment of pregnant women	
Organization / Program Name	**Relevant Changes in Practice or Policy**
Central Ohio Hospital Council	– Coordinated legal support, through Legal Aid, at four prenatal care sites throughout the four hospital systems to resolve issues for pregnant women and their families.
Mount Carmel Health Systems *Obstetric Clinic*	– Offered legal services with Medical-Legal Partnership, increased smoking cessation services with Columbus Public Health, and community support with Moms2B
CelebrateOne Nationwide Children's Hospital Columbus Public Health	– Developed consistent social determinants screening process for prenatal clinics affiliated with the Ohio Better Birth Outcomes Collaborative
CelebrateOne	– Continued collaboration to double the capacity of two home visiting programs, operated by the Center for Family Safety and Healing/Nationwide Children's Hospital and Columbus Public Health, through the Ohio Department of Medicaid
Nationwide Children's Hospital *Ohio Better Birth Outcomes Collaborative*	– Developed consistent social determinants screening process for prenatal clinics affiliated with the Ohio Better Birth Outcomes Collaborative
Nationwide Children's Hospital *The Center for Family Safety and Healing*	– Continued and expanded agency collaboration with CelebrateOne and together submitted an application through Medicaid to expand community home visitation services
Ohio State University Medical Center *Ohio Perinatal Quality Collaborative*	– Initiated development of Maternal Opiate Medical Supports Plus (MOMS+) Project[2]
CelebrateOne *Executive Committee*	– Adopted a Home Visiting System Improvement Plan in July 2017 and identified aggressive goals for increasing the number of women participating in home visiting – Convened a monthly workgroup to assess accessibility and utilization of these services in an ongoing way
StepOne for Healthy Pregnancies	– Broadened StepOne starting in January 2018 to provide referrals to home visiting services in addition to prenatal care
PrimaryOne Health Centers	– Expanded access to Centering Pregnancy, a group prenatal care program that addresses the comprehensive needs of women, by opening two new locations and securing funding for a third
The Ohio State University *Moms2B*	– Secured funding to expand the program from four to eight locations where mothers are assessed each week for their non-medical needs
HandsOn Central Ohio	– Hired a Pregnancy Care Coordinator, with funding from CelebrateOne, to improve the knowledge about and referrals to non-medical programs and services for pregnant and parenting families

[2] The MOMS+ Project is a two-year quality improvement initiative that seeks to improve maternal and fetal health outcomes, improve family stability, and reduce costs of Neonatal Abstinence Syndrome (NAS) to Ohio's Medicaid program by providing treatment to pregnant mothers with opiate issues during and after pregnancy through a Maternity Care Home (MCH) model of care. https://grc.osu.edu/Projects/MEDTAPP/MaternalOpiateMedicalSupports

FIMR Year 2 Postpartum-Related Recommendations	
• Ask One Key Question®, then provide desired birth control, including LARC, prior to hospital discharge • Schedule postpartum appointment prior to delivery discharge • Assist opiate-positive women to connect with treatment prior to delivery discharge • Educate families about the purpose, limitations and funding of autopsy • Develop more robust grief supports	
Organization / Program Name	**Relevant Changes in Practice or Policy**
Fly Barber Lyfe Foundation *Infant Mortality Grief Services*	– Applied for funding to offer a series of events, outings, services, and activities to families grieving a pregnancy or infant loss – Offered additional services within the grief support group related to parenting other children while grieving, family planning, tobacco cessation and other support services
March of Dimes *Maternal & Child Health*	– Aim to fund a One Key Question project in early 2018
Mental Health America of Franklin County *Perinatal Outreach & Encouragement for Moms*	– Developed new partnership with a perinatal loss organization – Planned (tentatively) to host a perinatal loss training for mental health providers in Fall 2018
Nationwide Children's Hospital *Ohio Better Birth Outcomes Collaborative*	– Worked with two hospital systems to increase number of LARCs provided during maternity stay – Developed educational resources focused on the importance of post-partum care
OhioHealth *My Baby + Me*	– Developed process to schedule postpartum visits with clients after delivery
OhioHealth *Wellness on Wheels*	– Referred opiate-dependent women to treatment and follow up – Developed pamphlets on grief – Provided referrals for grief services, if needed – Made every effort to schedule postpartum visits for patients – Discuss autopsies, if indicated
CelebrateOne	– Completed a stakeholder driven set of recommendations for the ADAMH Board regarding drug treatment for pregnant women
CompDrug and StepOne	– Received funding to house a treatment counselor, employed by ComDrug, at StepOne to assist women with securing prenatal care and treatment early in their pregnancies

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