Calhoun County

Fetal Infant Mortality Review

2015-2021 Report

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Introduction

Fetal Infant Mortality Review (FIMR) is a process of identification and analysis of factors that contribute to fetal and infant death through chart reviews and interviews with families in individual cases. FIMR complements other studies of infant death but uses an approach that is community-based and designed to bring together local health providers, consumers, advocates, and leaders. FIMR identifies strengths and areas for improvement in overall service systems and community resources for families. FIMR also provides direction toward the development of new policies to safeguard families.

FIMR has two goals:

- To describe significant social, economic, cultural, safety, health, and system factors that contribute to mortality
- To design and implement community-based action plans founded on the information obtained from the reviews

Notification (typically through the arrival of a death certificate) initiates the case abstraction process which utilizes birth and death certificates, prenatal, hospital, pediatric, emergency medical services (EMS), and public health records, as well as autopsy reports. The FIMR Coordinator conducts voluntary home interviews with the family to assess the family's needs, provide appropriate referrals, and obtain the caregiver's perceptions. The FIMR Coordinator de-identifies and compiles all information to form a case summary. The FIMR Case Review Team (CRT) meets quarterly to review completed case summaries. During team deliberations, factors associated with and contributing to infant deaths are identified and recommendations for policy development and systems change are compiled.

All information is kept confidential in compliance with privacy regulations and the Health Insurance Portability and Accountability Act (HIPAA). Issue Summary Reports may be shared with the Maternal and Infant Health Commission, Child Death Review, and other community action groups for consideration and implementation. De-identified case summary information is sent quarterly to a statewide database administered by the Michigan Public Health Institute for surveillance and reporting purposes.

The FIMR program serves as an assessment program, a core function of public health practice. Through the regular collection, analysis, and sharing of health data and information about risks and resources in a community, the FIMR program identifies trends in infant mortality and the factors that may be involved. Identifying these trends and their factors is the first step in planning interventions to decrease the Calhoun County infant mortality rate.

FIMR is a surveillance methodology used nationally in over 240 sites in 40 states, including 13 Michigan sites, to monitor and understand infant death. A complex system of information can be obtained from the FIMR CRT review, in conjunction with vital statistics, Pregnancy Risk Assessment Monitoring System (PRAMS), Behavioral Risk Factor Surveillance Survey (BRFSS), Maternal Mortality Review data, and other public health surveillance methods.

Calhoun County FIMR Financial Supporters (2015-2021)

- Battle Creek Community Foundation
- Calhoun County Public Health Department
- Michigan Department of Health & Human Services (MDHHS)- Maternal and Child Health Services Block Grants
- Michigan Public Health Institute

Risk Factors Associated with Outcome

While our county-level data reflect the number of fetal and infant deaths in Calhoun County, understanding what factors contribute to fetal and infant deaths is imperative so we can make recommendations and provide guidance to improve countywide birth outcomes. The MDHHS Pregnancy Risk Assessment Monitoring System (MI PRAMS) gathers information from mothers around the state to better help understand birth outcomes. The following data provide background for behaviors and risks between 2016-2020 in Michigan.

Unmet Basic Needs

- 1 in 4 (23.1%) Michigan mothers had at least one basic need such as food, housing, or transportation that was not met during pregnancy (Sauter et al., 2021). About 1 in 10 (8.4%) had two or more unmet basic needs. These proportions were virtually unchanged across birth years 2016-2019 (Sauter et al., 2021).

Life Stressors

- Nearly 7 in 10 mothers (68.5%) experienced at least one of the life stressors asked about on Michigan PRAMS (Sauter & Hardy, 2022). The proportion of mothers reporting that they or their husbands or partners had a cut in work hours or pay significantly increased from 2019 (13.8%) to 2020 (21.6%; Sauter & Hardy, 2022).

Pregnancy Intention

- In 2018, 57.2% of Michigan mothers reported that their pregnancy was intended. This was similar to the proportion of intended pregnancies seen in 2016 (58.9%) and 2017 (55.8%; Haak et al., 2019).
- Over half of the mothers who did not have a pre-pregnancy healthcare visit had an unintended pregnancy (53.9%; Haak et al., 2019).
- Unintended pregnancy was prevalent among mothers who had a pre-pregnancy healthcare visit but did not discuss how to improve their health before pregnancy (43.2%; Haak et al., 2019). Twice as many mothers who did not have a pre-pregnancy healthcare visit had an unintended pregnancy compared to mothers who had a visit and discussed how to improve their health before pregnancy (53.9% VS. 22.5%; Wallace et al., 2021).

Health Behaviors

- Marijuana use before, during, and after pregnancy remains elevated since the 2018 vote to legalize recreational marijuana use and the policy implementation in 2020 (Sauter & Hardy, 2022). In 2019, 1 in 15 mothers (6.5%) used marijuana during pregnancy: an increase from 3.1% in 2016-2017 (Sauter et al., 2021). About 1 in 4 Michigan mothers (23.4%) reported any marijuana use in the year before pregnancy; an increase from 12.4% in 2016-2017 (Sauter & Hardy, 2022). In 2020, 1 in 8 mothers (13.0%) reported marijuana use since the birth of their new baby; an increase from 10.9% in 2019, 7.8% in 2018, and 4.8% in 2016-2017 (Sauter & Hardy, 2022).

Prenatal Care

- Many women start prenatal care during the first trimester; among those who do not, just under half (47.6%) wish care had started sooner (Haak et al., 2019).
- The most prevalent barriers to timely prenatal care in 2018 were that they did not know they were pregnant (50.4%) or could not get an appointment (40.8%), the same barriers cited in 2016 and 2017 (Haak et al., 2019).

Maternal Postpartum Care

- One in seven Michigan mothers (13.6%) did not have a postpartum visit for themselves following pregnancy (Sauter & Hardy, 2022).
- Screenings for depression (90.9%) and discussions about contraceptives (88.3%) were both common (Sauter & Hardy, 2022).

Infant Immunizations

- The proportion of Michigan mothers who plan to follow all of their physician's recommendations for infant immunization has slowly decreased in the last four years (87.7% in 2016, 84.0% in 2019; Sauter et al., 2021).
- About 1 in 30 mothers plan that their infants will receive no vaccinations at all (2.9%; Sauter et al., 2021).

Overview of Calhoun County Data

Tables 1 through 5 and Figures 1 and 2 summarize the infant death data for Calhoun County in the years 2015 through 2021. The data give an overview of geographic, demographic, and mortality information for each of the infant deaths in the county during that time. Figure 1 shows the breakdown of fetal and infant deaths over the period of this review. 2019 had the fewest deaths (n=4) and 2017 had the highest number of deaths (n=14). The most recent year, 2021, shows lower numbers than the previous year (n=7).

Figure 1. Year of Fetal or Infant Death in Calhoun County, 2015-2021

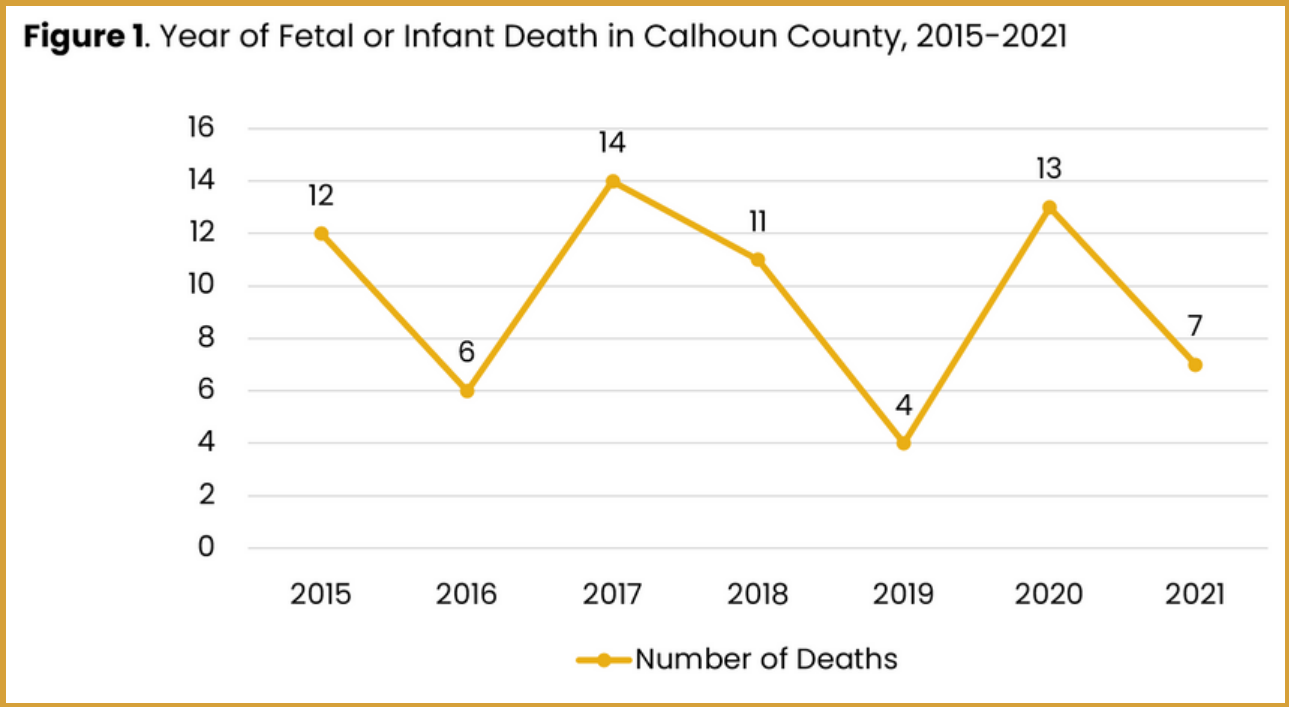

Table 1 breaks down the geographic information for each fetal and infant death case by county of death and the zip code of the family's home. This table reflects where fetal and infant deaths occurred for residents of Calhoun County.

Calhoun and Kalamazoo counties have the highest number of fetal and infant deaths for residents of Calhoun County, which is to be expected because the nearest Level I Trauma Center is located in Kalamazoo County. The two hospitals located in Calhoun County are Level III Trauma Centers. The Other Counties category is comprised of fetal and infant deaths of Calhoun County infants that occurred in other counties throughout Michigan.

The zip code data indicate that 49015 and 49037 have the highest frequencies (n=20 and n=14, respectively).

Table 1. Geographic Information for Fetal and Infant Deaths in Calhoun County, 2015-2021

	Number of Deaths	Percent
County		
Calhoun	36	53.73
Kalamazoo	20	29.85
Washtenaw	6	8.96
Other Counties[a]	5	7.46
Total	67	100.00
Zip Code of Home		
49014	9	13.43
49015	20	29.85
49017	9	13.43
49037	14	20.90
49224	8	11.94
Other Zip Codes[b]	7	10.45
Total	67	100.00

[a] Other Counties include Branch, Kent, Ingham, and Jackson

[b] Other Zip Codes include 49011, 49068, and 49245

Table 2 depicts the race and ethnicity demographics of infant deaths in Calhoun County for the years 2015 to 2021. Race and ethnicity are reported as they were recorded on the death certificates for each case. Collecting race and ethnicity data gives an important insight into health disparities in the county.

Table 2. Race[a] and Ethnicity[a] of Fetal and Infant Deaths in Calhoun County, 2015-2021

	Number of Deaths	Percent
Race		
Black/African American	19	28.36
White	40	59.70
Other[b]	8	11.94
Total	67	100.00
Ethnicity		
Hispanic	6	8.96
Non-Hispanic	61	91.04
Total	67	100.00

[a] Race and Ethnicity as reported on death certificates

[b] Other includes Asian, Asian Indian, and Caucasian/African American

In Calhoun County, the counts of White infant deaths are higher than that of Black/African American deaths, but the rates of each tell a different story. For the years 2019 to 2021, the average White infant mortality rate (per 1,000 live births) was 4.3 while the rate for Black/African American infants was approximately double that at 8.0 per 1,000 live births (MDHHS, 2021).

The overall difference in rates is shown in Figure 2 below. The visualization highlights the differences seen in mortality rates between White and Black infants in Calhoun County, and how those rates have changed over the last seven years.

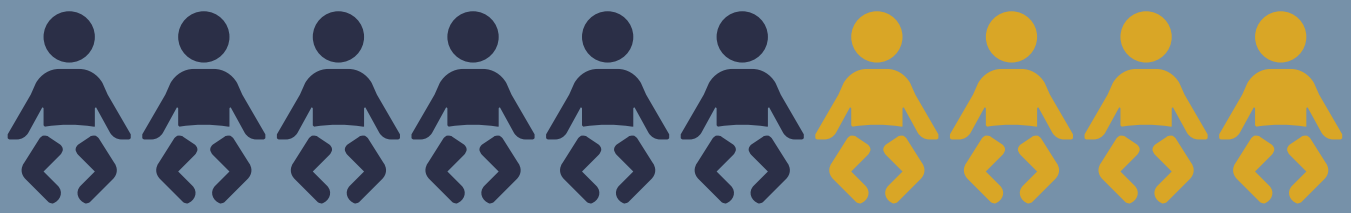

Figure 2. Infant Mortality Rates (per 1,000 live births) in Calhoun County by Race, 2015-2021

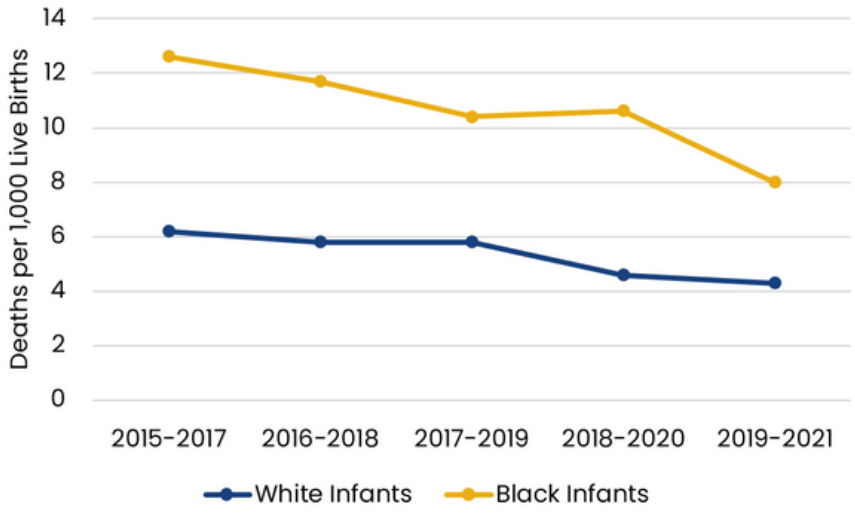

Table 3 shows the distribution of the infant age at the time of death. The frequencies are consistent across these categories; however, each category covers a different amount of time and should be taken into consideration when reading the table.

Table 3. Age at Death for Fetal and Infant Deaths in Calhoun County, 2015-2021

	Number of Deaths	Percent
0-59 Minutes	16	23.88
1-23 Hours	15	22.39
1-29 Days	12	17.91
1-11 Months	24	35.82
Total	67	100.00

Tables 4 and 5 break down the cause of death for each case into the manner of death, found on the death certificate, and the cause of death category, based on groups set by the state of Michigan's FIMR team. A list of what makes up each category can be found below. The most common manner of death was natural (n=41) while the most common cause of death category was perinatal (n=35).

Prenatal, perinatal, and postpartum care for the mother are important variables to consider in the cause of death for fetal and infant deaths. Along with the mother's medical care, a family's choice to vaccinate their child and that child's sleep environment are valuable variables to consider. According to MDHHS, vaccination is associated with reducing SIDS by 50% (MDHHS, 2022). Of the 67 deaths at this time, 11 had some form of unsafe sleeping conditions, and all eight of these can be seen in the Sudden Infant Death Syndrome/Sudden Unexplained Infant Death (SIDS/SUID) category.

Table 4. Manner of Death for Fetal and Infant Deaths in Calhoun County, 2015-2021

	Number of Deaths	Percent
Natural	41	61.19
Indeterminate	12	17.91
Other[a]	14	20.90
Total	67	100.00

[a] Other includes Accidental, Homicide, and Unknown deaths

Table 5. Cause of Death Classified by Michigan Categories, Calhoun County, 2015-2021

	Number of Deaths	Percent
Congenital	13	19.40
Infection	4	5.97
Perinatal	35	52.24
Other	2	2.99
SIDS	13	19.40
Total	67	100.00

List of Specific Causes of Death in each Michigan FIMR Category

Perinatal

Complications of Birth
Moderately Preterm (32 – 36 weeks)
Very Preterm (28 – 31 weeks)
Extreme Preterm 1 (24 – 27 weeks)
Extreme Preterm 2 (21 – 23 weeks)
Extreme Preterm 3 (20 weeks or below)
Birth Trauma

Congenital

Nervous System
Cardiovascular
Respiratory
Gastrointestinal
Genitourinary
Musculoskeletal
Chromosomal
Other
Unknown

Infection

Nervous System
Respiratory
Septicemia
Other

SIDS/SUID

Other

Motor Vehicle
Poisoning
Fire/Burn
Drowning
Asphyxia
Overlay
Maltreatment
Other Injury
Other
Necrotizing Enterocolitis
Elective Termination

Unknown

Recommendations and Conclusions

Between 2015-2021, the CCPHD FIMR program faced challenges due to staffing, access issues, and the COVID-19 pandemic, leading to the CRT only meeting twice during this time period. To help work through these challenges, CCPHD partnered with Kalamazoo County abstractors and utilized the CCPHD Data Analyst to complete some of the case summaries. Due to this reduced capacity, recommendations were limited, and some are carried over from the 2013-2014 FIMR Report.

Obstetrical Care Recommendations

- Ensure that all parents have access to preconception and interconception care.
- Ensure that pregnant people have access to prenatal care that is acceptable, accessible, and appropriate, and includes stressing early entry (by 12 weeks), an appropriate number of visits, or a telehealth program if needed (American College of Obstetricians and Gynecologists, 2020)
- Provide mentoring, support, outreach, and advocacy to improve the social and psychological environment for families at risk

Systems Recommendations

- Coordinate continuum of care between community programs and the health care system
- Entities should work to provide complete patient records when requested by FIMR Coordinator
- Ensure there is a review process in place at birthing hospitals when a poor birth outcome occurs
- Completion of cultural competency training by providers
- Provide support for health care providers for difficult situations leading to infant deaths (cultural beliefs, etc.)

- Creating, encouraging, and supporting community-based organizations as a complement to traditional medical care for specific populations will create a diverse approach to training and funding to create systemic changes (Van Eijk et al., 2022). Supporting grassroots organizations that provide doula services will give access to birthing parents who have experienced systemic racism, care, and improved birth outcomes throughout pregnancy and postpartum

- Identify and address unconscious bias in health care through training and self-awareness of cultural identity, beliefs and values, power bias, and stereotypes to explore ways of delivering care to patients in a respectful and compassionate way responding to family's experiences, values, beliefs, and preferences (Office of Health Equity, 2022)

Other Recommendations

- Enroll pregnant people with previous poor birth outcomes in intense, home-based services for attention to interconception care and counseling.

- Provide prenatal vitamins for all pregnant people of childbearing age

- Conduct mental health assessment preconception and following delivery for all families

Recommendations from the Infant Safe Sleep Program

- Ensure resources are shared at every location associated with the prenatal process including primary care, obstetricians, midwives and doulas, hospitals, community health agencies, and insurance providers. These referrals, along with education before birth, give families opportunities to ask questions and obtain a safe sleep environment which are factors that can reduce the risk of infant death.

- In 2020 and 2021, CCPHD would meet with families outside at their vehicles, due to COVID-19 restrictions. Education was completed over the phone, but additional education was discussed when a Pack n Play was distributed. The process included what resources the family needed. Referrals were made to area partners on behalf of the family. This discussion is an important key to preventing infant mortality. Some families have resorted to bed sharing because they didn't know where to get assistance with a safe sleep environment. Discussions with families early on and reminders throughout the pregnancy reaffirm safe sleep education.

- Restart the Calhoun County Community Action Team (CAT) to ensure the prenatal recommendations made by the CRT are implemented. The CAT has not met since 2019 due to COVID-19. Recommendations are being made by the CRT to the state but need the partnership of the community members with influence to collaborate across and within local systems to implement change.

- As the county transitions out of the pandemic, ensure that routine prenatal appointments occur by identifying gaps in service. Since COVID-19, more pregnant parents are late to care than pre-pandemic (MDHHS, n.d.).

- Encourage "tummy time." It is important to practice supervised tummy time while babies are awake to build strong neck and shoulder muscles.

Infant mortality rates are often used to compare the health and well-being of populations across and within counties: a low rate of infant mortality typically signifies a healthier population. The Calhoun County Fetal Infant Mortality Review program's community approach to improving the health of underserved women and infants plays a key role in forming recommendations to ultimately reduce the infant mortality rate within Calhoun County.

For more information on FIMR or a copy of this report, please visit us on the web at www.calhouncountymi.gov/publichealth. You may also contact Andrea Morrison, FIMR Coordinator, Calhoun County Public Health Department, at amorrison@calhouncountymi.gov or 269-234-3764.

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PUBLIC HEALTH
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References

American College of Obstetricians and Gynecologists. (2020, January 23). Implementing telehealth in practice. ACOG. Retrieved from https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2020/02/implementing-telehealth-in-practice

Haak, P., Wallace, A., Sauter, H., & Hardy, J. (2019, November). 2018 Birth Year Maternal and Infant Health Summary Tables. Michigan PRAMS Reports. Retrieved from https://www.michigan.gov/mdhhs/-/media/Project/Websites/mdhhs/Folder1/Folder40/2019-12-12_MI_PRAMS_2018_Tables_APPROVED.pdf?rev=d79feb5347214107abdfd993146c15a6&hash=29092084D869A7FCCDC440877C8EE797

Michigan Department of Health and Human Services. (2021). Michigan infant death statistics: January 1 through December 31, 2021. Division for Vital Records and Health Statistics. https://vitalstats.michigan.gov/osr/annuals/Infant%20Deaths%202021.pdf

Michigan Department of Health and Human Services. (n.d.). Numbers & Percent of Live Births by Level of Prenatal Care and Race or Ancestry of Mother. Calhoun Community Health Tables Listing. Retrieved from https://vitalstats.michigan.gov/osr/chi/FullTableList.asp?RegionType=1&RegionCode=13&Submit=Tables

Michigan Department of Health and Human Services (MDHHS). (2022, May). Know the facts: Vaccines and sudden infant death syndrome (SIDS) - Michigan. Safe Sleep and Vaccines MDHHS Pub 1293. Retrieved from https://www.michigan.gov/-/media/Project/Websites/mdhhs/Folder4/Folder13/Folder3/Folder113/Folder2/Folder213/Folder1/Folder313/Vaccines_and_SIDS_-_Resources_and_Studies_7-7-20.pdf?rev=80e055aeedfd4caa8d929c8d4d442bc0

Office of Health Equity. (2022, April 6). Working together to reduce Black Maternal Mortality. Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/healthequity/features/maternal-mortality/index.html

Sauter, H., Haak, P., & Hardy, J. (2021, April). 2019 Birth Year Maternal and Infant health Summary Tables. Michigan PRAMS Reports. Retrieved from https://www.michigan.gov/mdhhs/-/media/Project/Websites/mdhhs/Folder4/Folder31/Folder331/2021-05-14_MI_PRAMS_2019_Annual_Tables.pdf?rev=baa8e63d3b9b43e5a62ec050c675c129&hash=0F0736511DD7C11C7A5CA982818D9E27

Sauter, H., & Hardy, J. (2022, January). 2020 Michigan PRAMS Birth Yearn Maternal and Infant Health Summary Tables. Michigan PRAMS Reports. Retrieved from https://www.michigan.gov/mdhhs/-/media/Project/Websites/mdhhs/MCH-Epidemiology/2020-MI-PRAMS-Annual-Tables-FINAL.pdf?rev=5153f2d6e86d4dc4aacfa574f10a5077&hash=5D8ECE42CE18BA194FBFA1E53A85A3C3

Van Eijk, M. S., Guenther, G. A., Kett, P. M., Jopson, A. D., Frogner, B. K., & Skillman, S. M. (2022). Addressing systemic racism in birth doula services to reduce health inequities in the United States. Health Equity, 6(1), 98–105. https://doi.org/10.1089/heq.2021.0033

Wallace, A., Sauter, H., & Hardy, J. (2021). A Michigan PRAMS Brief for Programs and Providers: Prepregnancy Health Discussions & Pregnancy Intention. Michigan PRAMS data. Retrieved from https://www.michigan.gov/-/media/Project/Websites/mdhhs/Folder4/Folder10/Folder3/Folder110/Folder2/Folder210/Folder1/Folder310/2021-02-16_Prepregnancy_Discussions.pdf?rev=011d3c5610794e0a8bfd96b54107d767

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