

**Calhoun County
Fetal and Infant Mortality Review
(FIMR)**

2008 Annual Report

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Summary

Fetal and Infant Mortality Review (FIMR) is a surveillance methodology used nationwide and in 15 Michigan sites to monitor and understand infant death. 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.

The Calhoun County FIMR Case Review Team reviewed 14 2008 infant deaths. All (100%) of the 2008 reviewed deaths were neonatal deaths - having occurred in the first 28 days of life - with most of the deaths occurring within the first 24 hours of life. Prematurity was associated with the majority (86%) of the cases reviewed. Nearly three quarters (71%) of the cases reviewed involved an infant with extremely low birthweight (< 750 grams). Maternal infections were seen in the majority (85%) of the cases, maternal tobacco use was found in half (46%) of the cases, and poverty was present in over half (54%) of the cases reviewed.

The review of cases accomplished by the Case Review Team has resulted in 19 different recommendations being passed on to the Maternal and Infant Health Commission. Recommendations included improvements in social services and health care systems and expanding education in regard to preconception and interconception care.

Introduction

Fetal and Infant Mortality Review (FIMR) is a process of identification and analysis of factors that contribute to fetal and infant death through chart review and interview of 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 women, children, and families. FIMR also provides direction towards the development of new policies to safeguard families.

FIMR has two goals:

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

Notification (typically through arrival of a death certificate) initiates the case abstraction process. Birth and death certificates, prenatal, hospital, pediatric, EMS, and public health records, and autopsy reports are utilized. A Nurse Practitioner conducts voluntary home interviews with the family to assess the family's needs, provide appropriate referrals, and to obtain the mother's perceptions. This information is de-identified and compiled by the Nurse Practitioner to form a case abstract. The FIMR Case Review Team meets regularly to review completed case abstracts. An issue summary report and a list of policy development and systems change recommendations are completed for each case abstract reviewed.

All information is kept confidential in compliance with HIPAA. Issue summary reports may be shared with the Maternal and Infant Health Commission, the Child Death Review, and other community action groups for consideration and implementation. Case abstract information is sent to Michigan Public Health Institute for surveillance purposes.

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FIMR is a surveillance methodology used in 15 Michigan sites (and nationwide) to monitor and understand infant death. Information gained from the FIMR team review, in conjunction with vital statistics data, Pregnancy Risk Assessment Monitoring System (PRAMS) data, Behavioral Risk Factor Survey (BRFS) data, Maternal Mortality Review data, and other public health surveillance methods, can produce a complex system of information.

Acknowledgement

FIMR was first introduced in Battle Creek in 1991, as one of the eight original national ACOG/NFIMR grantees to implement a three-year FIMR program. Reintroduced in Calhoun County in 1999, FIMR has been revitalized and restored to become an efficiently functioning program and active voice in our community.

As FIMR enters into its 12th straight year of reviewing infant deaths in Calhoun County, recognition must be given to the dedicated group of people who volunteer their time to meet monthly as members of the FIMR Case Review Team. Without their passion and participation, the work of FIMR could not be done.

Calhoun County FIMR Case Review Team, 2008 Cases

- Sara Birch, Oaklawn Hospital
- Jean Cairns, Family & Children Services
- Cyntheal Cooper, Calhoun County Department of Human Services
- Muriel Crow, FIMR Abstractor/Home Interviewer, Calhoun County Public Health Department
- Genessa Doolittle, FIMR Coordinator, Calhoun County Public Health Department
- Rosemary Fournier, State FIMR Coordinator, Michigan Department of Community Health
- Samuel Grossman, Family Health Center of Battle Creek
- Diana Hazard, Calhoun County Public Health Department
- Patrick Horton, Planned Parenthood of South Central Michigan
- Summer Liston, Oaklawn Hospital
- Vivien McCurdy, Gentiva Health Services
- Sandra Milner, Calhoun County Department of Human Services
- Heidi Pengra, Lifespan
- Linda Ratti, Battle Creek Public School Alternative Education
- Kristin Roux, Calhoun County Public Health Department
- Theresa Scott, Family & Children Services
- Sallie Shears, Summit Pointe

It is also important to pay recognition to those area agencies that support the work of FIMR. Without their support, the work of FIMR would not be possible.

Calhoun County Fetal and Infant Mortality Review Financial Supporters 2008 Cases

- Battle Creek Community Foundation
- Calhoun County Public Health Department
- Michigan Department of Community Health – Maternal Child Health Grant
- Michigan Public Health Institute
- W.K. Kellogg Foundation

2008 FIMR Data

Table 1 details the progress of Calhoun County FIMR over the last three years. Cases not reviewed by Calhoun County FIMR are reviewed by the Calhoun County Child Death Review Team, coordinated by Calhoun County Department of Human Services.

Table 1: Calhoun County Infant Mortality and FIMR Case Review

	2006	2007	2008
Total Infant Deaths ¹	17	28	15
FIMR CRT Reviews	17	25	14

Calhoun County continues to see a disparity in infant mortality rates between Caucasians and African Americans. The three-year (2005-2007) average rate was nearly three times as high for African Americans (25.2)² than Whites (8.5)³.

Table 2: Calhoun County African American Infant Mortality

	2006	2007	2008
African American Infant Deaths	8	10	3
Percent of Infant Deaths that were African American ⁴	47%	36%	20%

Table 3: Causes of Death (as listed on death certificates), 2008

- Congenital Lactic Acidosis, Circulatory Shock
- Extreme Prematurity (6)
- Hypoxic Ischemic Encephalopathy
- Multisystem Organ Failure, Ornithine Transcarbamylase Deficiency
- Prematurity (4)
- Severe Prematurity
- Sudden Unexplained Infant Death (reviewed by Calhoun County Child Death Review)

1. 2006 – 2007 State official totals: 1989-2007 Michigan Resident Death Files and Michigan Resident Birth Files, Epidemiology Services Division, Vital Records and Health Data Development Section, Michigan Department of Community Health. 2008 total is unofficial total, includes number of death certificates received by the Calhoun County Public Health Department.
2. 1995- 2007 Michigan Resident Death Files and Michigan Resident Birth Files, Vital Records & Health Data Development Section, Michigan Department of Community Health.
3. 1995- 2007 Michigan Resident Death Files and Michigan Resident Birth Files, Vital Records & Health Data Development Section, Michigan Department of Community Health.
4. Race reported on death certificates received by Calhoun County Public Health Department.

Table 4 shows the number of cases reviewed by gestational age. Over half of the cases (57%) were infants with a gestational age of 23 weeks or less. The age of viability, the point at which a fetus has some chance of surviving outside the mother if born prematurely, is viewed by many experts as being between 22 and 25 weeks of gestation.

According to a report released by the March of Dimes in March 2009, the average medical costs for the first year of life of an infant born healthy and full-term is approximately \$4,500. The average medical costs for the first year of life of an infant born prematurely and/or low birthweight (less than 37 weeks gestation and/or less than 2,500 grams) is approximately \$49,000.¹ In 2007, 11% of all infants born in Calhoun County were born prematurely, and nearly 9% were born low birthweight.² Nearly half of the births in Calhoun County over the last five years have been Medicaid paid births.³

Table 4: Gestational Age at Birth, 2008 Infant Deaths

N = 14	Total	Percent
< 20 weeks	4	29%
21-23 weeks	4	29%
24 – 27 weeks	3	21%
28 – 31 weeks	0	0
32 – 36 weeks	1	7%
37 + weeks	2	14%

Table 5: Age of Infant at Time of Death, 2008 Infant Deaths

N = 14	Total	Percent
≤ 24 hours	10	71%
1 – 7 days	2	14%
8 – 28 days	2	14%

Table 6: Birthweight, 2008 Infant Deaths

N = 14	Total	Percent
Extremely Low Birthweight (<750 grams)	10	71%
Very Low Birthweight (751 – 1500 grams)	1	7%
Moderate Low Birthweight (1501 – 2499 grams)	1	7%
Normal Birthweight (>2500 grams)	2	14%

1. March of Dimes Foundation. (2008). The Cost of Prematurity to Employers. Retrieved from http://marchofdimes.com/peristats/pdfdocs/cts/ThomsonAnalysis2008_SummaryDocument_final121208.pdf
2. 2007 Michigan Resident Birth Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health.
3. Annie E. Casey Foundation (2009). Kids Count Data Center: Profile for Calhoun County. Michigan League for Human Services.

Tables 7 and 8 include demographic information regarding the mothers of the infants that died in 2008. FIMR reviewed one case of twin infant deaths in 2008; this is reflected below.

Table 7: Age of Mother at Time of Birth, 2008 Infant Deaths

N = 13	Total	Percent
≤ 18 years	0	0
19 – 22 years	5	38%
23 – 26 years	2	15%
27 – 30 years	3	23%
31 – 34 years	3	23%
≥ 35 years	0	0

Table 8: Education Attained by Mother, 2008 Infant Deaths

N = 13	Total	Percent
> 12 th grade	1	8%
High School Graduate or GED Completed	6	46%
Some College Credit, But No Degree	3	23%
Associates Degree	1	8%
Bachelors Degree	2	15%

The FIMR Case Review Team (CRT) reviews the case abstracts at monthly meetings. From this review of the data, the CRT identifies factors that were present in each of the cases. Tables 9 through 13 include selected information* taken from the issue summary reports completed for each case reviewed. The first column lists the factors included on issue summary reports. The second column lists the number of cases that were found to have the factor present. The third column lists the percentage of cases found to have this factor.

Table 9: Maternal Risk Factors, Medical

N = 13	Present	Percent
Chorioamnionitis	8	62%
Infection	11	85%
Sexually Transmitted Infection	4	31%
Poor Nutrition	1	8%
Obese	3	23%
Insufficient Weight Gain	2	15%
Asthma	3	23%

Due to missing height measurements for many of the cases, it was impossible for the CRT to determine obesity for those cases. However, the CRT strongly suspects that the Maternal Risk Factor of Obesity as reported here is artificially low. Had the CRT been able to calculate Body Mass Index for all of the reviewed cases, it is strongly believed that the factor of obesity would be present in a much larger percentage of the 2008 cases.

* Report includes all factors that were present in at least 2 (15%) of the 2008 cases reviewed.

Table 10: Maternal Risk Factors, Previous Poor Birth Outcomes

N = 13	Present	Percent
Voluntary Interruption of Pregnancy	2	15%
Spontaneous Abortion (miscarriage)	4	31%
Previous Preterm Delivery	2	15%

Table 11: Maternal Risk Factors, Mental Health

N = 13	Present	Percent
Maternal History of Mental Illness	3	23%
Depression During Postpartum	2	15%

Table 12: Maternal Risk Factors, Behavioral

N = 13	Present	Percent
Tobacco	6	46%
Alcohol	2	15%
Illicit Drugs	5	38%
Inadequate Prenatal Care	4	31%
No Prenatal Care	2	15%
Intended Pregnancy	3	23%
Infant Exposed to Secondhand Smoke	2	15%

Table 13: Maternal Risk Factors, Psychosocial

N = 13	Present	Percent
Single Parent	6	46%
Teen Pregnancy	2	15%
Poverty Present (Medicaid)	7	54%

Table 11 shows the percentage of cases in 2005, 2006, 2007, and 2008 with select factors.

Table 14: Selected Factors, 2005 - 2008

	2005	2006	2007	2008
Extreme Prematurity (< 28 weeks)	50%	56%	65%	79%
Low Birth Weight (< 2500 grams)	69%	64%	74%	86%
Maternal Tobacco Use	50%	43%	39%	46%
Congenital Anomalies	0	21%	13%	21%
Late Entry to Prenatal Care	19%	21%	26%	7%
Unsafe Sleep Environment	19%	19%	11%	0
First Pregnancy < 18 years	6%	7%	35%	NA
Overweight/Obese	NA	14%	43%	23%

FIMR Recommendations

After reviewing the data and identifying the factors present, the CRT forms recommendations for the Maternal and Infant Health Commission. Below are the CRT recommendations formed in response to the 14 2008 infant deaths reviewed.

Multiple Recommendations

- Routine drug testing for all mothers that meet one of four criteria: late or no entry to prenatal care, history of drug use, pregnancy complications consistent with drug use, or symptoms of drug use evident. (7)
- More emphasis on preconception care/genetic counseling/education; more focus on preconception and interconception care. (5)
- Ensure care providers are aware of Maternal Infant Health Program and other program eligibility; increase referrals to MIHP when appropriate; have intake note whether MIHP was referred and if patient denied referral. (3)
- Better recognition of high-risk patient and utilization of appropriate, timely referrals to Maternal Fetal Medicine and perinatology; assure access to perinatology services. (2)
- Early identification of high-risk clients with multiple poor outcomes; surround the mother with intensive home-based services aimed at affecting future pregnancies. (2)
- Need for standardized psycho-social tools and perinatal history tools across care providers - revise questionnaires used during prenatal exams to ensure that questions being asked align with what FIMR looks for to enhance reviews, especially in regard to social data, birth control, and height/weight measurements. (2)
- Review protocols for transfer to High Risk center. Review transport policies, define conditions appropriate for transfer, and improve communication between hospitals for NICU transportation. (2)
- Internal audits for deliveries with poor outcomes. (2)

Systems Issues

- Increase amount of third party payers who will cover genetic counseling, especially for those with history of genetic problems.
- Better follow-up and treatment of urinary tract infections (UTIs) during pregnancy.
- Better attention to patient concerns regarding complaints and signs of preterm labor; ensure staff is reporting complaints to physician.

- Educate providers regarding signs of life in an infant.
- Better coordination of care between mental health and obstetrics; better communication between providers and doctor-to-doctor referrals.
- Ensure care providers are "adhering to standard of care for high-risk women".
- Expand support services to women with private insurance.
- Providers NEED to show consideration/sensitivity to all patients.
- Increase referrals for social work, Child Protective Services, and family planning services.
- Address Emergency Department procedures for newly diagnosed pregnancies - prenatal screens must be done, make Maternal Infant Health Program referrals, and get Department of Human Services caseworkers involved.
- Need for community health workers in this community.
- Access to preventative health care preconception would minimize known risk factors for poor pregnancy outcomes.

Questions to be Addressed -

- Is meconium testing being done at area hospitals?
- Learn more about hospital "bereavement packages".