



FETAL AND INFANT MORTALITY REVIEW  
2012  
ANNUAL REPORT



CALHOUN COUNTY PUBLIC HEALTH DEPARTMENT

# TABLE OF CONTENTS

- Acknowledgment..... 1
- Introduction ..... 2
- 2012 Case Summary ..... 3
- 2012 FIMR Data ..... 4
- FIMR Recommendations ..... 8
- Conclusion ..... 9

*Enhancing the health and well-being of women, infants, and families by improving community resources and service delivery systems available to them.*

# A CKNOWLEDGMENT

The Fetal and Infant Mortality Review (FIMR) program was first introduced to Calhoun County in 1999. Over a decade later and after many trials and tribulations, it has been revitalized and restored to become an efficiently functioning program and active voice in our community.

As FIMR enters into its 15<sup>th</sup> year of reviewing infant deaths in Calhoun County, recognition must be given to the dedicated group of people who volunteer their time to meet 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, 2012 CASES

- Kathryn Bernhardt, Calhoun County Department of Human Services
- Sara Birch, Oaklawn Hospital
- Lori Collyer, Connect Health Services
- Michelle Datema, Calhoun County Public Health Department
- Rosemary Fournier, State FIMR Coordinator, Michigan Department of Community Health
- Dr. Summer Liston, Oaklawn Hospital
- Dr. Elizabeth Mettler, Family Health Center of Battle Creek
- Vivien McCurdy, Connect Health Services
- Heidi Pengra, Calhoun County Public Health Department
- Linda Ratti, Community Member
- Dr. Lesley Reid, Family Health Center of Battle Creek
- Kristin Roux, Calhoun County Public Health Department
- Sallie Shears, Summit Pointe
- Erin Somerlott, FIMR Coordinator, Calhoun County Public Health Department

It is also important to recognize the area agencies whose support makes FIMR possible.

## CALHOUN COUNTY FIMR FINANCIAL SUPPORTERS, 2012 CASES

- Battle Creek Community Foundation
- Calhoun County Public Health Department
- Michigan Department of Community Health – Maternal Child Health Grant
- Michigan Public Health Institute
- United Way of the Battle Creek and Kalamazoo Region

# I NTRODUCTION

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 healthcare 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 identify 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 receipt of a death certificate) initiates the case abstraction process. Birth and death certificates, prenatal, hospital, pediatric, emergency medical services, and public health records, as well as autopsy reports are utilized. The FIMR Coordinator conducts voluntary home interviews with the family to assess the family's needs, provide appropriate referrals, and obtain the mother's perceptions. All information is de-identified and compiled by the FIMR Coordinator to form a case summary. The FIMR Case Review Team (CRT) meets regularly 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 HIPAA. Issue summary reports may be shared with the Maternal and Infant Health Commission (MIHC), the Child Death Review, and other community action groups for consideration and implementation. De-identified case summary information is sent regularly 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 in 13 Michigan sites and over 240 sites in 40 states 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 Surveillance Survey (BRFSS) data, Maternal Mortality Review data, and other public health surveillance methods, can produce a complex system of information.

## 2012 CASE SUMMARY

The Calhoun County FIMR Case Review Team (CRT) reviewed eight cases of infants who died in 2012. An infant death is defined as the death of any infant born live who does not survive until his/her first birthday. Over three quarters (88%) of the reviewed deaths were neonatal deaths - having occurred within the first 28 days of life - with most of the deaths occurring within the first 24 hours of life (63%). Prematurity and extremely low birth weight (ELBW), or birth weight less than or equal to 750 grams, were associated with nearly two thirds (63%) of the cases reviewed. Maternal overweight or obesity was seen in 38% of the cases, maternal tobacco use was found in 63% of the cases, and poverty was present in almost two thirds (63%) of the cases reviewed. Of the eight mothers involved in the cases reviewed, half (50%) had no drug test performed at delivery where it would have been indicated. The criteria that indicates a drug screen at delivery are late or no prenatal care (multiple missed appointments), unexplained preterm labor, complications known to be associated with drug use, history of a prenatally drug exposed infant, symptomology or obvious behavior suggestive of alcohol or drug use, and history of drug use.

The review of cases accomplished by the CRT has resulted in 10 unduplicated recommendations being passed on to the MIHC. Recommendations included improvements in referrals to social services and health care systems, implementing a standard, universal, routine drug screen, and ensuring that all women have access to preconception and interconception care.



*"A baby is born  
with a need to be  
loved - and never  
outgrows it."  
Frank A. Clark*

# 2012 FIMR DATA

Table I 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 (CDR) Team, coordinated by Calhoun County Department of Human Services.

**Table I: Calhoun County Infant Mortality and FIMR Case Review**

	2010	2011	2012
Total Infant Deaths <sup>1</sup>	18	17	10
FIMR CRT Reviews	14	13	8

Calhoun County continues to see a disparity in infant mortality rates between Caucasians and Blacks. The three-year (2009-2011) average rate was three times as high for Black babies (25.4)<sup>2</sup> than Caucasian babies (7.9)<sup>3</sup>.

**Table 2: Calhoun County Black Infant Mortality (of cases reviewed)**

	2010	2011	2012
Black Infant Deaths	7	4	2
Percent of Infant Deaths that were Black <sup>4</sup>	50%	31%	25%

**Table 3: Causes of Death (as listed on death certificates), 2012**

- Extreme prematurity
- Extreme prematurity/hyperkalemia/intraventricular hemorrhage
- Fetal lung immaturity, premature delivery, preterm labor (hourglassing membranes), possible maternal incompetent cervix
- Extreme prematurity, chorioamnionitis (mother under influence of cocaine)
- Severe prematurity (18 weeks), preterm labor, acute chorioamnionitis
- Bradycardia/subsequent cardiac arrest, severe tricuspid valve regurgitation with congestive heart failure, hypoplastic left heart syndrome
- Hypoplastic left heart syndrome, obstructed pulmonary venous return s/p repair, tracheo-esophageal fistula, possible VACCTRL syndrome
- Acute renal failure, acute liver failure with coagulopathy, disseminated HSV infection
- Asphyxia due to smothering, co-sleeping with adult – Reviewed in CDR
- Asphyxiation due to suffocation and body position – Reviewed in CDR

1. 2010 – 2011 State official totals: 1989-2011 Michigan Resident Death Files and Michigan Resident Birth Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health. 2012 total is unofficial, includes number of death certificates received by the Calhoun County Public Health Department.

2. 1998- 2011 Michigan Resident Death Files and Michigan Resident Birth Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health.

3. 1998- 2011 Michigan Resident Death Files and Michigan Resident Birth Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health.

4. Race reported on death certificates received by Calhoun County Public Health Department.

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 birth weight (less than 37 weeks gestation and/or less than 2,500 grams) is approximately \$49,000.<sup>1</sup> In 2011, 11% of all infants born in Calhoun County were born prematurely and 9% were born low birth weight.<sup>2</sup> In 2011, 60% of the births in Calhoun County were Medicaid-paid births, up from 44% in 2002.<sup>3</sup>

Tables 4 through 6 show the number of cases reviewed by gestational age, the age of the infant at the time of death, and birth weight. Fifty percent (50%) of the cases were infants with a gestational age of 23 weeks or less. The age of viability, or 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.

**Table 4: Gestational Age at Birth, 2012 Infant Deaths**

<b>N = 8</b>	<b>Total</b>	<b>Percent</b>
≤ 20 weeks	2	25%
21 – 23 weeks	2	25%
24 – 27 weeks	1	13%
28 – 31 weeks	0	0%
32 – 36 weeks	0	0%
37 + weeks	3	38%

**Table 5: Age of Infant at Time of Death, 2012 Infant Deaths**

<b>N = 8</b>	<b>Total</b>	<b>Percent</b>
≤ 24 hours	5	63%
1 – 7 days	1	13%
8 – 28 days	1	13%
1 – 5 months	1	13%
6 – 12 months	0	0%

**Table 6: Birth Weight, 2012 Infant Deaths**

<b>N = 8</b>	<b>Total</b>	<b>Percent</b>
Extremely Low Birth Weight (<750 grams)	5	63%
Very Low Birth Weight (751 – 1500 grams)	0	0%
Moderate Low Birth Weight (1501 – 2499 grams)	0	0%
Normal Birth Weight (>2500 grams)	3	38%

1. March of Dimes Foundation. (2008). The Cost of Prematurity to Employers. Retrieved from [http://marchofdimes.com/peristats/pdfdocs/cts/ThomsonAnalysis2008\\_SummaryDocument\\_final121208.pdf](http://marchofdimes.com/peristats/pdfdocs/cts/ThomsonAnalysis2008_SummaryDocument_final121208.pdf)
2. 2011 Michigan Resident Birth Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health.
3. Annie E. Casey Foundation (2010). Kids Count Data Center: Profile for Calhoun County. Michigan League for Human Services.

Table 7 includes demographic information regarding the mothers of the infants that died in 2012.

<b>N = 8</b>	<b>Total</b>	<b>Percent</b>
≤ 18 years	0	0%
19 – 22 years	3	38%
23 – 26 years	2	25%
27 – 30 years	1	13%
31 – 34 years	2	25%
≥ 35 years	0	0%
Unknown	0	0%

The FIMR CRT reviews the case summaries and from this review of the data, the CRT identifies factors that were present in each of the cases. Tables 8 through 14 include selected information taken from the issue summary reports completed for each case reviewed. Tables include all factors that were present in at least 2 (25%) of the 2012 cases 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 (total of eight) found to have this factor.

**Table 8: Maternal Risk Factors, Medical**

<b>N = 8</b>	<b>Present</b>	<b>Percent</b>
Chorioamnionitis	6	75%
Preterm Labor	4	50%
Infection (not STI)	3	38%
Incompetent Cervix	3	38%
Overweight/Obese	3	38%
Insufficient Weight Gain	2	25%
Infection: Bacterial Vaginosis (BV)	2	25%
Late Entry to Prenatal Care	2	25%

**Table 9: Maternal Risk Factors, Previous Poor Birth Outcomes**

<b>N = 8</b>	<b>Present</b>	<b>Percent</b>
Previous Spontaneous Abortion	3	38%

**Table 10: Maternal Risk Factors, Mental Health**

<b>N = 8</b>	<b>Present</b>	<b>Percent</b>
Maternal History of Mental Illness	3	38%
Depression During Pregnancy/Postpartum	2	25%

**Table 11: Maternal Risk Factors, Behavioral**

<b>N = 8</b>	<b>Present</b>	<b>Percent</b>
Tobacco Use	5	63%
No Drug Test	4	50%
Second Hand Smoke Exposure	4	50%
Alcohol Use	4	50%
Illicit Drugs	2	25%
No Birth Control	2	25%

**Table 12: Maternal Risk Factors, Psychosocial**

N = 8	Present	Percent
Single Parent	6	75%
Poverty Present (Medicaid or No Insurance)	5	63%
Private Insurance (HMO/non-HMO)	3	38%

**Table 13: Fetal/Infant Risk Factors, Medical**

N = 8	Present	Percent
Prematurity	5	63%
Extremely Low Birth Weight (<750 g)	5	63%
Congenital Anomalies	2	25%
Respiratory Distress Syndrome	2	25%
Infection/Sepsis	2	25%

**Table 14: Prenatal Care and Documentation (Access to Data)**

N=8	Present	Percent
Inconsistent Information	5	63%
Lack of Referrals	2	25%
Lack of Clarity	2	25%
Missing Data	2	25%

Table 15 shows the percentage of cases in 2009, 2010, 2011, and 2012 with select factors.

**Table 15: Selected Factors, 2009 – 2012**

	2009	2010	2011	2012
Low Birth Weight (< 2500 grams)	86%	79%	85%	63%
Overweight/Obese	14%	64%*	75%*	38%*
Extreme Prematurity (< 28 weeks)	71%	57%	85%	63%
Maternal Tobacco Use	50%	36%	42%	63%
Congenital Anomalies	36%	29%	23%	25%
Late Entry to Prenatal Care	14%	14%	0%	25%

\*The increased percentage of obesity/overweight is likely due to improved reporting of maternal height and weight in the prenatal records.

*Making Calhoun County a healthy place to live.*

# FIMR RECOMMENDATIONS

After reviewing the data and identifying the factors present, the CRT forms recommendations for the MIHC. Below are the CRT recommendations formed in response to the eight reviews of infant deaths that occurred in 2012.

## MULTIPLE RECOMMENDATIONS

- Ensure that all women have access to preconception/interconception care. (7)
- Standard, universal, routine drug screen where indicated at delivery. These indicators are late entry to or no prenatal care (multiple missed appointments), unexplained preterm labor, pregnancy complications known to be associated with drug use, history of a prenatally drug exposed infant, symptomology or obvious behavior suggestive of alcohol or drug use, and history of drug use. (4)
- Increase provider awareness of appropriate referrals and eligibility to support services. (4)
- Dietician referral. (2)

## SYSTEMS ISSUES

- Need for standardized ultrasound.
- All pregnant women need early and often prenatal care.
- Flag providers on chorioamnionitis.
- Ensure post-natal follow up.
- Increased obstetric provider documentation of family planning.
- Coordinated continuum of care between programs and part of the health care system.





## CONCLUSION

Infant mortality rates are often used to compare the health and well-being of populations across and within countries: a low rate of infant mortality typically signifies a healthier population. The Calhoun County FIMR 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 for a copy of this report, please visit us on the web at [http://www.calhouncountymi.gov/government/health\\_department/fetal\\_infant\\_mortality\\_review/](http://www.calhouncountymi.gov/government/health_department/fetal_infant_mortality_review/).

You may also contact Erin Somerlott, FIMR Coordinator, Calhoun County Public Health Department, at [esomerlott@calhouncountymi.gov](mailto:esomerlott@calhouncountymi.gov) or (269) 969-6482.



CALHOUN COUNTY PUBLIC HEALTH DEPARTMENT

JAMES A. RUTHERFORD, MPA  
HEALTH OFFICER

GREGORY HARRINGTON, DO  
MEDICAL DIRECTOR

KRISTIN ROUX, MPH  
HEALTH EDUCATION MANAGER

ERIN SOMERLOTT, MPH  
FIMR COORDINATOR

190 E. MICHIGAN AVENUE  
BATTLE CREEK, MICHIGAN 49014  
(269) 969-6482 (TEL)  
(269) 966-1489 (FAX)

[WWW.CALHOUNCOUNTYMI.GOV/PUBLICHEALTH](http://WWW.CALHOUNCOUNTYMI.GOV/PUBLICHEALTH)