

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

**2010 Annual Report**

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## Summary

Fetal and Infant Mortality Review (FIMR) is a surveillance methodology used nationwide and in 14 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 (CRT) reviewed 14 cases of infants who died in 2010. An infant death is defined as the death of any infant born live who does not survive until his/her first birthday. Nearly three quarters (71%) of the 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 (79%) of the cases reviewed. Most (86%) of the cases reviewed involved an infant with low birthweight (< 2500 grams). Maternal overweight or obesity was seen in 64% of the cases, maternal tobacco use was found in 36% of the cases, and poverty was present in half (57%) of the cases reviewed.

The review of cases accomplished by the CRT has resulted in 16 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 regards 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 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 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, 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.

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FIMR is a surveillance methodology used in 14 Michigan sites and over 220 sites in 42 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.

## **Acknowledgement**

FIMR 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 14<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 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, 2010 Cases**

- Kathryn Bernhardt, Calhoun County Department of Human Services
- Sara Birch, Oaklawn Hospital
- Cyntheal Cooper, Calhoun County Department of Human Services
- Muriel Crow, FIMR Abstractor/Home Interviewer, Calhoun County Public Health Department
- Genessa Doolittle, Calhoun County Public Health Department
- Rosemary Fournier, State FIMR Coordinator, Michigan Department of Community Health
- Summer Liston, Oaklawn Hospital
- Vivien McCurdy, Connect Health Services
- Heidi Pengra, Lifespan/Calhoun County Public Health Department
- Linda Ratti, Battle Creek Public School Alternative Education
- Kristin Roux, Calhoun County Public Health Department
- Sallie Shears, Summit Pointe
- Courtney Weathers, FIMR Coordinator, Calhoun County Public Health Department

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 FIMR Financial Supporters, 2010 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 Greater Battle Creek

## 2010 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**

	2008	2009	2010
Total Infant Deaths <sup>1</sup>	14	20	18
FIMR CRT Reviews	14	14	14

Calhoun County continues to see a disparity in infant mortality rates between Caucasians and African Americans. The three-year (2007-2009) average rate was approximately twice as high for African Americans (20.5)<sup>2</sup> than Whites (9.3)<sup>3</sup>.

**Table 2: Calhoun County African American Infant Mortality**

	2008	2009	2010
African American Infant Deaths	3	5	7
Percent of Infant Deaths that were African American <sup>4</sup>	20%	24%	39%

**Table 3: Causes of Death (as listed on death certificates), 2010**

- Anencephaly
- Anoxic encephalopathy
- Complex congenital heart disease
- Congenital anomalies incompatible with life
- Disseminated intravascular coagulation, extreme prematurity
- Extreme prematurity (3)
- Meningitis
- Multisystem organ failure, prematurity
- Necrotizing enterocolitis, extreme prematurity
- Pre-viable birth
- Respiratory failure, polycystic kidneys
- Respiratory failure, extremely low birthweight
- Blunt force head injuries (reviewed by Calhoun County Child Death Review)
- Drowning (reviewed by Calhoun County Child Death Review)
- Sudden unexplained infant death (reviewed by Calhoun County Child Death Review)
- Sudden unexplained infant death associated with co-sleeping (reviewed by Calhoun County Child Death Review)

1. 2008 – 2009 State official totals: 1989-2009 Michigan Resident Death Files and Michigan Resident Birth Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health. 2010 total is unofficial, includes number of death certificates received by the Calhoun County Public Health Department.
2. 1998- 2009 Michigan Resident Death Files and Michigan Resident Birth Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health.
3. 1998- 2009 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.

Table 4 shows the number of cases reviewed by gestational age. Twenty nine percent (29%) of the cases 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.<sup>1</sup> In 2009, 11% of all infants born in Calhoun County were born prematurely, 8% were born low birthweight, and 2% were born very low birthweight.<sup>2</sup> In 2009, 60% of the births in Calhoun County have been Medicaid-paid births, up from 40% in 2001.<sup>3</sup>

**Table 4: Gestational Age at Birth, 2010 Infant Deaths**

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

**Table 5: Age of Infant at Time of Death, 2010 Infant Deaths**

<b>N = 14</b>	<b>Total</b>	<b>Percent</b>
≤ 24 hours	8	57%
1 – 7 days	1	7%
8 – 28 days	1	7%
1 – 5 months	4	29%

**Table 6: Birthweight, 2010 Infant Deaths**

<b>N = 14</b>	<b>Total</b>	<b>Percent</b>
Extremely Low Birthweight (<750 grams)	6	43%
Very Low Birthweight (751 – 1500 grams)	4	29%
Moderate Low Birthweight (1501 – 2499 grams)	1	7%
Normal Birthweight (>2500 grams)	3	21%

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. 2009 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 2010.

**Table 7: Age of Mother at Time of Birth, 2010 Infant Deaths**

<b>N = 14</b>	<b>Total</b>	<b>Percent</b>
< 18 years	4	29%
19 – 22 years	2	14%
23 – 26 years	3	21%
27 – 30 years	2	14%
31 – 34 years	1	7%
≥ 35 years	2	14%

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 9 through 14 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**

<b>N = 14</b>	<b>Present</b>	<b>Percent</b>
Preterm Labor	6	43%
Obese	5	36%
Overweight	4	29%
Chorioamnionitis	3	21%
Pregnancy >35 years	2	14%
Infection (not STI)	2	14%
Multiple Gestation	2	14%
Premature Rupture of Membranes	2	14%
Oligohydramnios	2	14%
Assisted Reproductive Technology Used	2	14%
Incompetent Cervix	2	14%

**Table 10: Maternal Risk Factors, Previous Poor Birth Outcomes**

<b>N = 14</b>	<b>Present</b>	<b>Percent</b>
Voluntary Interruption of Pregnancy	2	14%
Spontaneous Abortion (Miscarriage)	2	14%
Previous Preterm Delivery	2	14%

**Table 11: Maternal Risk Factors, Mental Health**

<b>N = 14</b>	<b>Present</b>	<b>Percent</b>
Depression During Pregnancy/Postpartum	3	21%
Lack of Grief Support	2	14%

\* Report includes all factors that were present in at least 2 (14%) of the 2010 cases reviewed.

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

<b>N = 14</b>	<b>Present</b>	<b>Percent</b>
Tobacco Use	5	36%
Intended Pregnancy	4	29%
Unintended Pregnancy	3	21%
Illicit Drugs	3	21%
No Prenatal Care	3	21%
Late Entry to Prenatal Care	2	14%
Alcohol Use	2	14%

**Table 13: Maternal Risk Factors, Psychosocial**

<b>N = 14</b>	<b>Present</b>	<b>Percent</b>
Poverty Present (Medicaid)	8	57%
Single Parent	7	50%
Teen Pregnancy	5	36%
History of Abuse (mom)	2	14%
Inadequate/Unreliable Transportation	2	14%

**Table 14: Fetal/Infant Risk Factors, Medical**

<b>N = 14</b>	<b>Present</b>	<b>Percent</b>
Prematurity	12	86%
Extremely Low Birthweight (<750 g)	7	50%
Congenital Anomalies	4	29%
Respiratory Distress Syndrome	4	29%
Very Low Birthweight (<1500 g)	3	21%
Infection/Sepsis	2	14%

Table 15 shows the percentage of cases in 2007, 2008, 2009, and 2010 with select factors.

**Table 15: Selected Factors, 2007 – 2010**

	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Low Birthweight (< 2500 grams)	74%	86%	86%	79%
Overweight/Obese	43%	23%	14%	64%
Extreme Prematurity (< 28 weeks)	65%	79%	71%	57%
Maternal Tobacco Use	39%	46%	50%	36%
Congenital Anomalies	13%	21%	36%	29%
Late Entry to Prenatal Care	26%	7%	14%	14%

## **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 reviews of infant deaths that occurred in 2010.

### **Multiple Recommendations**

- Improved preconception and interconception care and counseling to help women be at their best health for future pregnancies (tobacco use, caffeine, nutrition counseling). (7)
- All pregnant women need early and often prenatal care. (4)
- Encourage appropriate pregnancy intervals. (3)
- Discuss family planning options with patients. (3)
- 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. (2)

### **Systems Issues**

- Adhere to standard guidelines for fetal development, i.e., during ultrasound.
- Need for standard fetal monitoring following maternal accident or injury.
- Ensure that chart reviews are looked at by all doctors who provided care to mother.
- Offer extended hours for care (evenings, weekends).
- Improved transportation options for patients.
- Perform a more complete psychosocial assessment at delivery.
- Consider perinatal hospice services for families with known lethal congenital anomalies.
- Standard documentation of grief support given at hospital.

### **Education Issues**

- Counseling and education with patients using assisted reproductive technology.
- Need for comprehensive sex education.
- Routine referral to regional genetics clinic following congenital anomalies.