Calhoun County
Fetal and Infant Mortality Review
(FIMR)

2007 Annual Report

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Summary

Fetal and Infant Mortality Review (FIMR) is a surveillance methodology used in 15 Michigan sites (and nationwide) 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 23 2007 infant deaths. Prematurity was associated with nearly all (91%) of the cases reviewed. Approximately half (52%) of the cases reviewed involved an infant with extremely low birth weight (< 750 grams). Many of the mothers (43%) were considered overweight or obese as defined by the Body Mass Index (BMI) scale. Maternal tobacco use was found in 39% 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 regards to preconception and interconception care and unplanned pregnancy.

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 improvements 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 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 (listing present and contributing factors) 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 System (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. Nearly a decade later and after many trials and tribulations, it has recently been revitalized and restored to become an efficiently functioning program and active voice in our community.

As FIMR enters into its 11th 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 Fetal and Infant Mortality Review Case Review Team 2007 Cases

- Sara Birch, Oaklawn Hospital
- Dottie-Kay Bowersox, Calhoun County Public Health Department
- Ailene Buchtrup, Calhoun County Department of Human Services
- Jean Cairns, Family & Children Services
- Muriel Crow, FIMR Abstractor/Home Interviewer, Calhoun County Public Health Department
- Robert Demski, Calhoun County Medical Examiner's Office
- Genessa Doolittle, FIMR Coordinator, Calhoun County Public Health Department
- Margy Everett, Gentiva Health Services
- Rosemary Fournier, State FIMR Coordinator, Michigan Department of Community Health
- Sam Grossman, Family Health Center of Battle Creek
- Diana Hazard, Calhoun County Public Health Department
- Pat Horton, Planned Parenthood of South Central Michigan
- Peggy Hughes, Family & Children Services
- Summer Liston, Oaklawn Hospital
- Beverly Palmer, Battle Creek Health System
- 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 2007 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

2007 FIMR Data

Table 1 details the progress of Calhoun County FIMR over the last three years. While the total number of infant deaths in Calhoun County has increased, so has the number of reviews completed by the FIMR Case Review Team (CRT).

Table 1: Calhoun County Infant Mortality and FIMR Case Review

	2005	2006	2007
Total Infant Deaths[1]	18	17	28
FIMR CRT Reviews	17	17	25

Calhoun County continues to see a disparity in infant mortality rates between Caucasians and African Americans. The three-year (2004-2006) average rate was nearly three times as high for African Americans (20.7)[2] than Whites (7.3)[3].

Of the 1,797 total live births that occurred in Calhoun County in 2006, approximately 14% (260) were to African American mothers.[4]

Table 2: Calhoun County African American Infant Mortality

	2005	2006	2007
African American Infant Deaths	4	8	10
Percent of Infant Deaths that were African American[5]	22%	47%	36%

1. 2005 – 2006 State official totals:1989-2006 Michigan Resident Death Files and Michigan Resident Birth Files, Epidemiology Services Division, Vital Records and Health Data Development Section, Michigan Department of Community Health. http://www.mdch.state.mi.us/pha/osr/chi/InDx/Trends/Counties/trd13.html. 2007 total is unofficial total, includes number of death certificates received by the Calhoun County Public Health Department.
2. 1995- 2006 Michigan Resident Death Files and Michigan Resident Birth Files, Vital Records & Health Data Development Section, Michigan Department of Community Health. http://www.mdch.state.mi.us/pha/osr/InDxMain/BckCoTbl.asp
3. 1995- 2006 Michigan Resident Death Files and Michigan Resident Birth Files, Vital Records & Health Data Development Section, Michigan Department of Community Health. http://www.mdch.state.mi.us/pha/osr/InDxMain/WtCoTbl.asp
4. Michigan 2006 Birth File, Vital Records & Health Data Development Section, Michigan Department of Community Health. http://www.mdch.state.mi.us/pha/osr/CHI/Births/frame.html
5. Race reported on death certificates received by Calhoun County Public Health Department.

Table 3: Causes of Death (as listed on death certificates), 2007

- Acute Zolpidem Intoxication
- Asphyxia, co-sleeping
- Co-sleeping/Undetermined
- Extreme Prematurity (12)
- Hydrops fetalis
- Kidney & liver failure/Multiple Congenital Anomalies
- Neonatal Herpes Simplex Virus Infection
- Premature delivery
- Pulmonary Hypoplasia (2)
- Sepsis/Hypotension/Hypoperfusion/Volume Overload/Hypoplastic Left Heart Syndrome
- Septic shock
- Sudden Unexpected Infant Death (bed sharing w/adult)
- Trisomy 13
- Undetermined

Table 4 shows the number of cases reviewed by gestational age. Half of the cases (52%) 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.

Table 4: Gestational Age at Birth of 2007 Infant Deaths

N = 23	Present	Percent
≤ 19 weeks	6	26%
20 – 23 weeks	6	26%
24 – 27 weeks	3	13%
28 – 32 weeks	2	9%
33 – 36 weeks	3	13%
37 + weeks	3	13%

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 5 through 14 include selected information[6] 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 5: Medical: Mother

N = 23	Present	Percent
Teen Pregnancy	6	26%
Chorioamnionitis	6	26%
Incompetent Cervix	4	17%
Sexually Transmitted Infection	3	13%
Overweight	5	22%
Obese	5	22%
Insufficient Weight Gain	3	13%
Pre-existing Hypertension	3	13%
Pre-eclampsia	3	13%
Preterm Labor	11	48%
Pregnancy < 1 yr Apart	5	22%
Preterm Premature Rupture of Membranes	11	48%
Prolonged Rupture of Membranes	6	26%
Previous Spontaneous Abortion (miscarriage)	5	22%
Oligohydramnios	6	26%
Previous Fetal Loss	3	13%
Previous Low Birth Weight Delivery	3	13%
Previous Preterm Delivery	4	17%
First Pregnancy < 18 yrs old	8	35%

Table 6: Family Planning

N = 23	Present	Percent
Intended Pregnancy	4	17%
Unintended Pregnancy	4	17%
No Birth Control	4	17%

Table 7: Substance Use

N = 23	Present	Percent
No Drug Test	13	57%
Tobacco Use	9	39%
Marijuana Use	5	22%
Prenatal Vitamin Use	15	65%

6. Report includes all factors that were present in at least 3 (13%) of the 2007 cases reviewed.

Table 8: Prenatal Care/Delivery

N = 23	Present	Percent
Late Entry to Prenatal Care	6	26%
Lack of Referrals	9	39%

Table 9: Medical: Fetal/Infant

N = 23	Present	Percent
Very Low Birth Weight (<1500 grams)	5	22%
Extremely Low Birth Weight (<750 grams)	12	52%
Congenital Anomaly	3	13%
Prematurity	21	91%
Infection/Sepsis	8	35%
Respiratory Distress Syndrome	9	39%

Table 10: Environment

N = 23	Present	Percent
Second-hand Smoke	7	30%
Little/No Breastfeeding	3	13%

Table 11: Social Support

N = 23	Present	Percent
Single Parent	10	43%
Living Alone	3	13%
<12th Grade Education	6	26%

Table 12: Mental Health/Stress

N = 23	Present	Percent
Maternal History of Mental Illness	4	17%
Multiple Stresses/Social Chaos	3	13%
Concern about Enough Money	5	22%

Table 13: Payment for Care

N = 23	Present	Percent
Private Insurance	10	43%
Medicaid	9	39%

Table 14: Documentation

N = 23	Present	Percent
Missing Data	4	17%

Table 15 shows the percentage of cases in 2005, 2006, and 2007 with select factors.

Table 15: Selected Factors, 2005 - 2007

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

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 23 2007 infant deaths reviewed.

Multiple Recommendations

- Better recognition of high-risk patient and utilization of appropriate; timely referrals to Maternal Fetal Medicine and perinatology; assure access to perinatology services (6)

- Early identification of high-risk clients with multiple poor outcomes; surround the mother with intensive home-based services aimed at affecting future pregnancies (4)

- 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 (4)

- Need for standardized psycho-social tools and perinatal history tools across care providers - revise questionnaires used during prenatal exams to further help in reviews, especially in regards to social data (3)

- Comprehensive meetings/de-briefing/ethical reviews of case - was full informed consent obtained regarding infant's care? Is there a policy for cases like this? (2)

Systems Issues

- Automatic Child Protective Services (CPS) referrals when patient delivers with history of involvement and/or positive drug test

- Referrals to Maternal Infant Health Program services when appropriate

- Early, more frequent assessment for vaginal infections
- Better statewide-processing of Medicaid applications; better facilitation of Medicaid applications, especially for pregnant women
- Increase number of placental pathologies completed
- Screen for all Sexually Transmitted Infections (STIs) during prenatal care health history
- Increase education with providers regarding assisted reproductive technology and its appropriateness, perhaps offer Continuing Medical Education (CME)
- Increase minimum hospital stay (72 hours?) for high-risk patients before discharge
- Review Emergency Departments' current policy and procedures regarding Sudden Unexpected Infant Death (SUID) to include: Medical Examiner involvement/jurisdiction, standard referral to CPS, and bereavement to assure compliance with newly adopted legislation (PA 177)

Education Issues

- More emphasis on preconception care/genetic counseling/education; more focus on preconception and interconception care
- Increase state resources for preconception care, especially for women with previous poor pregnancy outcome - focus on nutrition, adequate weight gain, early detection and treatment of infections, avoidance of harmful substances
- Increased focus on avoidance of unplanned pregnancies
- Develop support groups in Battle Creek; market existing support group in Marshall more heavily
- Develop Maternal Infant Health Program services/education for clients who have had a previous loss

Questions to be Addressed -

- What happens to infant with pending Medicaid who can no longer receive prescription under mother's Medicaid number?
- What happens in perinatology/tertiary care? Is termination an option? Is Hospice available at local care?