Jackson County
Fetal and Infant Mortality Review
Annual Report 2007

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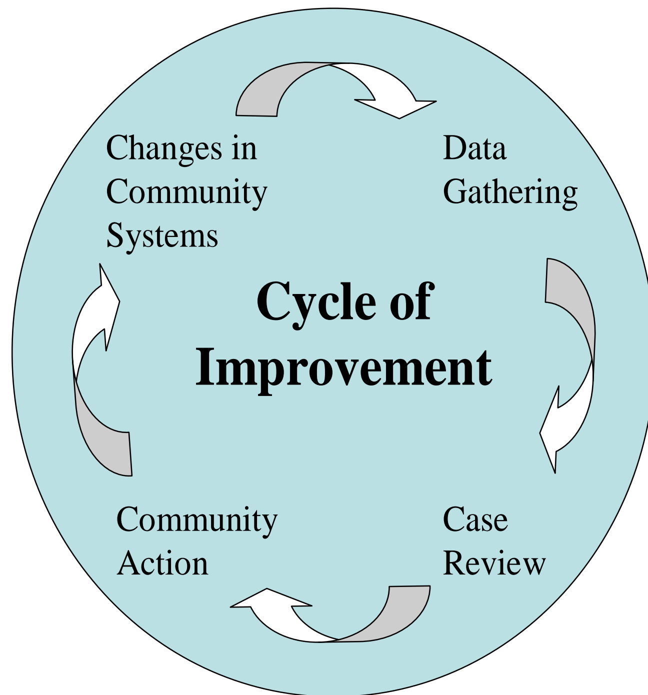
The FIMR Process



History of FIMR in Jackson County

In June 2002, Jackson County formed its Fetal and Infant Mortality Review Program (FIMR) with the overarching goal of reducing infant mortality in our community. This local program is modeled after the National FIMR program sponsored by the American College of Obstetrics and Gynecology (ACOG) and receives technical support at the State level. There are currently 16 FIMR Programs across the State of Michigan. FIMR programs strive to help communities like ours better understand the issues involved in infant deaths and then design programs and services to improve pregnancy outcomes by enhancing the health and well being of women, infants, and families.

The FIMR program is a two-tiered process consisting of the Case Review Team (CRT) and the Community Action Team (Jackson County Prenatal Task Force). The FIMR process begins with the careful review of each infant death. A local multidisciplinary Case Review Team (CRT) comes together to examine confidential, de-identified, cases of infant death. Data reviewed may include public health records, prenatal care history, maternal hospitalizations, labor and delivery history, infant records, and DHS records. After careful review of each case, the CRT develops recommendations that are submitted to the Action Team (Prenatal Task Force, a group of community professionals). The Action Team's job is to prioritize and implement those recommendations into community actions that result in improved community resources and services for women, children, and families. The FIMR model emphasizes the importance of both the analytic function (data collection and analysis through case review; recommendations) and action functions (disseminate findings; facilitate implementation of recommended strategies and interventions). From it's beginning through 12-2006, the FIMR program has held 40 Case Review Team meetings, reviewed 84 cases of infant death (94%), and has provided bereavement visits for 47 women (56%).

FIMR Findings from Case Review

As a result of infant death reviews the FIMR CRT identified six priority areas of perinatal concern. These priority areas are supported by data from the Perinatal Periods of Risk Model (PPOR), which analyzes IM data and translates local statistical data into strategies for intervention. For Jackson County, the highest rates of infant mortality fall into the areas of Maternal Health/Prematurity and Infant Health. The six priority areas for action relating to these categories are: 1) decreasing the number of pregnancies resulting in preterm labor and deliveries 2) decreasing maternal tobacco, alcohol, and drug exposure 3) decreasing unintended pregnancies 4) assuring consistent assessment and referral for domestic violence and mental health concerns 5) increasing awareness of safe infant sleep practices and 6) improving collection and use of vital statistical information related to infant mortality. The Prenatal Task Force has completed its strategic plan for each of the identified issues and is in the process of implementing many of the objectives identified in the plan.

Some of the initiatives set forth so far include:

~Prematurity Awareness Campaign
- *Inter-conception Care Brochure and Pregnancy Fact Sheets*
- *Signs of Preterm Labor Refrigerator Magnets*
- *Prenatal Packets for women applying for Medicaid*
- *Pharmacy Labels /Preterm Labor Signs*
- *House to House Peer Education Program*

~Decreasing Maternal Tobacco, alcohol, and drug exposure and assuring consistent assessment and referral for domestic violence and mental health issues
- *Prenatal Smoking Cessation Program*
- *Standardized Psychosocial Screening Tool (for drug, alcohol, mental health, and domestic violence) and Referral Tree for practitioners*

~Increasing awareness of infant safe sleep practices
- *Jackson County Safe Sleep Coalition*
- *Crib Program for low income families*
- *Onesie Safe Sleep Campaign*
- *Community presentations*
- *Partnering with Childcare Licensing Agency for Childcare trainings*

~Improving collection of Vital Statistics
- *Partnering with local hospital and OB providers to improve birth data collection*
- *Prenatal survey assessing perinatal access to services and maternal behaviors*

Data Collection

The data presented in this report reflects information gathered through reviews of infant deaths for Jackson County residents from 2002 through 2006, as well as background data on Jackson County from Michigan Department of Community Health's linked birth-death files and Kid's Count Data Book. With each year of review the sample size grows and continues to validate earlier findings. These findings provide insight into issues that currently have few other measures.

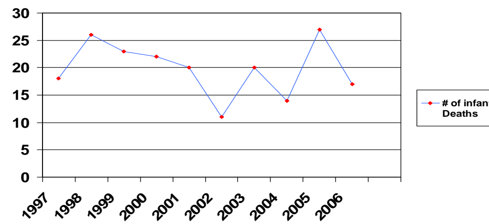
Data collection for FIMR programs consist of three instruments: 1) the Maternal and Child Profile which summarizes demographic information on the mother, father, and the baby 2) the Issues Related to Infant Mortality Summary (commonly known as the P's and C's sheet) which identifies medical, family, psychosocial, environmental, and service factors that were present or contributed to infant death, and 3) The Issues and Recommendation Summary which recommends changes in community resources and service delivery based on needs, strengths, and service gaps identified through case review.

Jackson County Profile

~Jackson County has averaged 2000 births and 19 infant deaths per year over the last 10 years
~Jackson County's IMRs have exceeded both State and National averages 8 out of 10 times in the last 10 years
~Jackson County continues to have a high disparity between black infant deaths and white infant deaths producing a ratio of 4.5 to 1
~Preterm births account for 10.5% of all live births, well above the Healthy People 2010 goal of 7.6%
~From 2002-2006, teen births comprised 14% of all live births but 22% of all infant deaths
~72.2 % of Jackson County mothers received adequate prenatal in 2006 compared to the State average of 77.7%

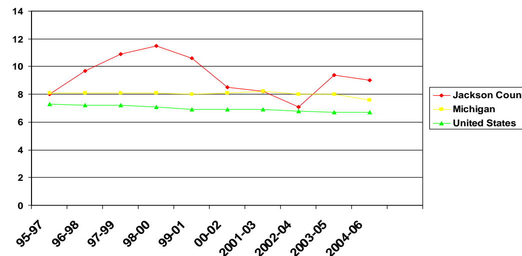
Infant Mortality Statistics

Number of Infant Deaths
1997-2006



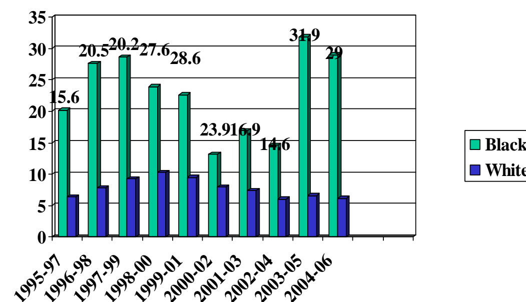
Jackson County averaged 19 infant deaths per year over a 10 year period.

Jackson County; 3 year ave IMR
Compared to Michigan and US



Jackson County's infant mortality rates have been well above both State and National rates except for 2002-2004 when it dipped below the state average and approached the national rate of 7 deaths per 1000 live births. Currently, Jackson County's 2004-06 IMR is 9.0 deaths per 1000 live births. All of these rates are well above to HP Goals 2010 of 4.5 infant deaths/1000 live births.

Jackson County: Black/White IMR
(3 year moving average) 1995-2006



Currently Jackson County's black /white infant mortality ratio is 4.7/1, the highest in the State.

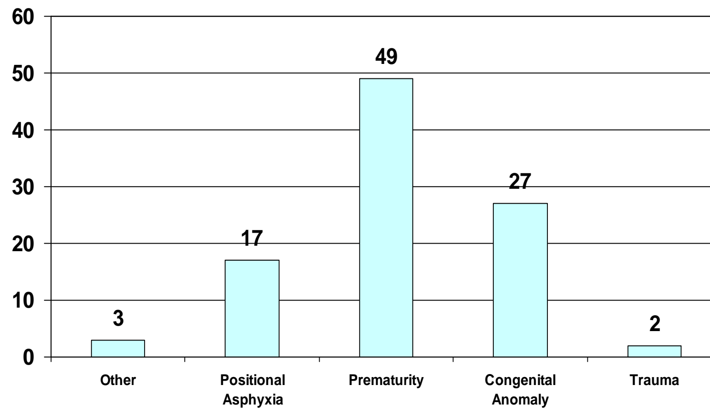
Michigan Communities with Greatest Racial Disparity in Infant Mortality

(3 year moving average Infant Death Rates, 2004-2006)*

Community	Black IMR*	White IMR *	B/W Ratio	Black Live Births 2006	Total IM Rate*
Jackson	29.0	6.2	4.7/1	206	9.0
Calhoun	20.7	7.3	2.8/1	260	9.6
Ingham	20.1	4.3	4.7/1	537	7.1
Kent	18.0	5.4	3.3/1	1216	8.0
Genesee	17.8	7.3	2.5/1	1651	10.5
Saginaw	17.8	5.0	3.6/1	720	8.5
Detroit City	16.8	4.7	3.6/1	10,360	15.0
Michigan	16.6	5.4	3/1	22,873	7.6
Oakland	16.6	4.9	3.4/1	2,021	6.5
Kalamazoo	16.0	4.7	3.4/1	536	6.5
Out-Wayne	15.8	501	3.1/1	2,195	6.5
Macomb	13.6	4.8	2.8/1	918	5.6
Muskegon	13.4	4.5	3/1	460	6.7
Washtenaw	12.1	4.5	2.7/1	714	6.0
Berrien	11.9	5.2	2.3/1	526	7.2

Jackson County is tied with Ingham County for the highest Black/White disparity in the State. While black infant births comprise 9.1% of all Jackson County live births, black infant deaths comprise 23% of all infant deaths. Because of the small African American population in Jackson County, any increase or decrease in infant birth or death numbers greatly impacts disparity ratios.

Breakdown of Causes



From 2002 through 2006, the Jackson County Fetal and Infant Mortality Review Program reviewed 84 out of 89 infant deaths (94%). In depth data analysis, taken from aggregate information from infant death reviews, shows that prematurity-related deaths continue to be the leading cause of infant death (49%), followed by congenital anomalies (27%) and positional asphyxia (sleep-related suffocation, 17%).

Too Early and Too Small

60% of all infant deaths occurred at less than 7 days of life (early neonatal). These early neonatal deaths were primarily deaths related to prematurity and congenital anomalies. Almost 2/3 of all infant deaths were to infants less than 32 weeks gestation that weighed less than 1500 grams (three pounds 5 ounces). Low birth weight (LBW) is recognized as one f the most important indicators of an infant's chance of survival (NVSS, 1-05). The Kid's Count Data Book 2007 ranked Jackson County 62/82 counties in the number of LBW infants. 8.1% of all Jackson County births are low birth weight (2002-2006). The National Vital Statistics System (NVSS) reports a 19% increase in the number of LBW infants from 1990-2006. In Jackson County African American women were two times more likely to give birth to a low birth weight infant than white women (MDCH 2007).

Since 1990, US births delivered at less than 34 weeks have risen 3.3%, and late preterm births (34-36 weeks) have risen 7.3% (NVSS 2007). These preterm infants are the most vulnerable, experiencing multiple morbidities including respiratory difficulties, infection, and brain hemorrhage. 10.5% of all live births in Jackson County are preterm births (MDCH 2007). 58% of all African American infant deaths in Jackson County are related to prematurity compared to 47% of white infant deaths related to prematurity.

Sleep-related Deaths

Jackson County averages 3 infant deaths per year to sleep-related incidents. These deaths are considered to be 100% preventable simply by sleeping babies on their backs, alone in a crib, not over-heating, placing nothing over the baby's face, making sure the sleep surface is firm and void of soft bedding such as blankets, pillows and stuffed animals, and not smoking. FIMR reviews show that 57% of mothers whose baby died in a sleep-related incident smoked tobacco. Recent studies estimate a 20 fold increase of infant death with co-sleeping. 57% of infants dying from sleep-related incidents were co-sleeping and 64% were in a non-infant bed (adult bed, swing, sofa). Additionally, one infant was in a basinet, an appropriate sleep surface, but was well over age and weight limits.

Sleep Environment and Sleep Positions
Contributing to Infant Death, 2002-2006

Condition	Number of deaths	Percent of deaths
Position/Compression Asphyxia (c) (n=84)	14	17
Asleep in non-infant bed (c) (n=14)	9	64
Not back sleeping (c) (n=14)	8	57
Co-sleeping, other adult or sibling (c) (n=14)	8	57
Soft bedding, extra blankets (6c, 1p) (n=14)	7	50
Lack of Adequate Adult Supervision (p) (n=14)	5	36
Maternal Smoking (n=14)	8	57

Number of deaths among infants born prematurely by selected characteristics, 2002-2006 (n=41)

Birthweight:	**No. of Deaths**	**Percent**
<750 g	31	76%
750-1499 g	10	24%
Gestational Age		
<24 weeks	21	51%
24-31 weeks	19	47%
32-37 weeks	1	2%
Maternal Age at Delivery		
15-19	9	22%
20-25	13	32%
26-40	18	44%
≥41	1	2%
Adequate Prenatal Care	33	80%
Unintended Pregnancy	17	59%
Mother unmarried	27	66%
Medicaid	27	66%
Mother with HS Diploma	31	76%
Race of Mother:		
Caucasian	30	73%
African Am.	11	27%

This table looks at the number of death among infants born prematurely by selected characteristics. All infants that died related to prematurity weighed less than 3 pounds 4 ounces and 76% of those weighed less than 1 pound 10 ounces (extremely low birth weight). All but one infant were less than 32 weeks gestation.

Teen Births

Teen births in Jackson County account for 14% of all live births but 22 % of all prematurity related deaths. Kid's Count 2007 reported the teen birth rate for Jackson County (2003-05 ave) to be 51.4 compared to the Michigan average of 33.6. Jackson County ranked 76 out of 82 counties in teen births. The National Vital Statistics System (NVSS) 2007 preliminary report, showed a 3% increase in 2006 for teen births (15-19) for the nation (41.9/1000 females). This was the first increase reported since 1991.

Prenatal Care

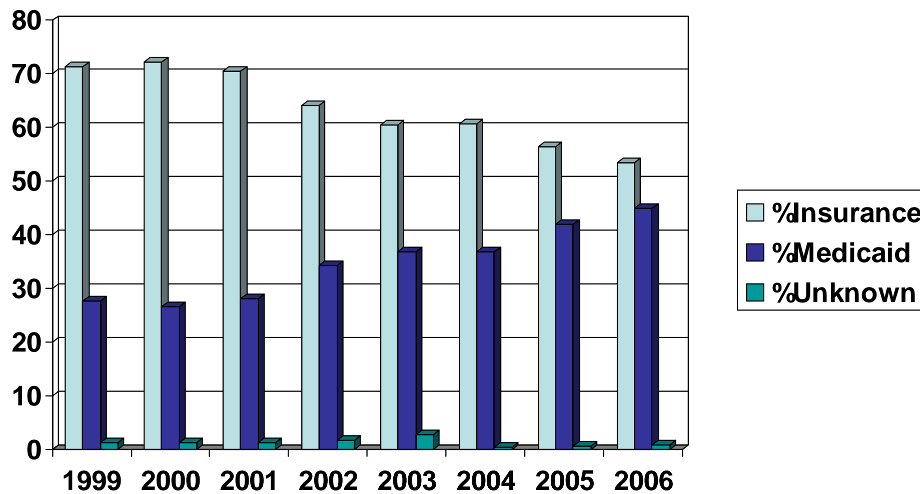
Reported levels of adequate of prenatal care (Kessner Index) for all Jackson County live births improved by a dramatic 77% from 2002 to 2006. In 2006, 72.2% of all mothers received adequate prenatal care. While improvement has been seen in Jackson County, we still fall short of the Healthy People Goal of 90% of women receiving adequate prenatal care. For mothers with an infant death related to prematurity, 80% received adequate prenatal (2002-2006).

Pregnancy Intention

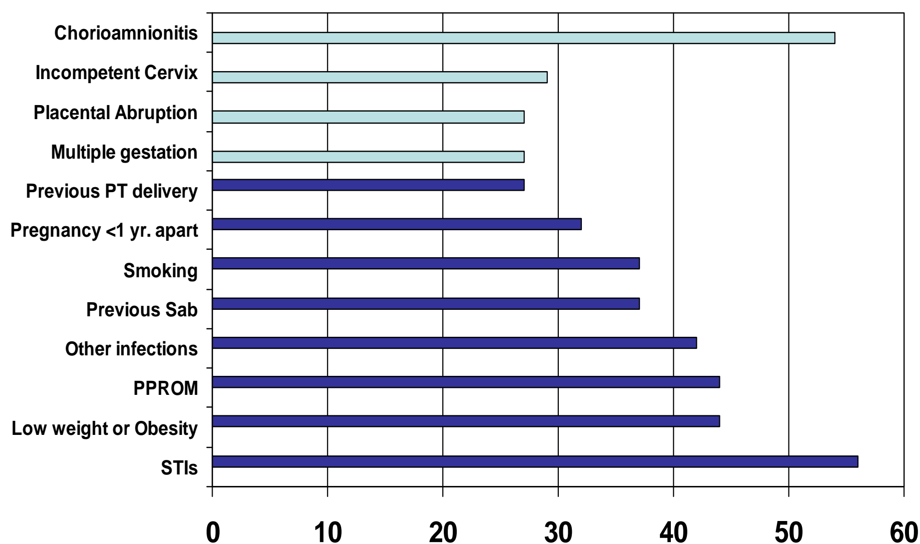
Planning a pregnancy provides women with an opportunity to be prepared physically, emotionally, and socially. Both maternal health and maternal behaviors impact pregnancy outcomes. For mothers who delivered prematurely and experienced subsequent infant death, less than half had a planned pregnancy. These numbers provide a basis for the need for preconception and inter-conception care.

Marital Status

Single mothers carried an increased risk of poor pregnancy outcome as evidenced by FIMR data that show 66% of mothers with an infant death were unmarried. In 2006, 45.7% of all Jackson County births were to single mothers. NVSS reports that nationally, births to unmarried women rose 8% from 2005 to 2006 and that 2006 numbers were 20% higher than in 2002, when the recent upswing began. In 2006, more than 4 in 5 births to teens were non-marital. Singled marital status is often coupled with lowered economic resources. 66% of mothers with a prematurity related infant death received Medicaid health insurance. Income guidelines for pregnancy Medicaid is 185% of the federal poverty level. From 1999-2006, Jackson County has seen a steady rise in the number of Medicaid deliveries.



%Jackson Premature Deaths by Maternal Medical Risk Factors, 2002-2006 (n=41)



Risk Factors

Prematuirty-related deaths were responsible for the largest number of infant deaths in Jackson County. This table looks at maternal medical risk factors in preterm deaths. The top four light blue bars are factors the FIMR CRT identified as "contributing" to the infant death. Chorioamnionitis (inflammation and infection of the membranes surrounding the fetus) contributed to 54% of preterm deliveries resulting in infant death, followed by incompetent cervix, placental abruption, and multiple gestation. The dark blue bars represent factors that were" present" for prematurity-related deaths with consistent frequency but, not determined as contributing. All of these risk factors have long been identified in the literature in predisposing to preterm birth. Sexually transmitted infections were present in 56% of mothers with preterm infant death and included Trichamonas, Chlamydia, and Human Papilloma Virus (HPV). Other infections that were present in 42% of these mothers included 8 mothers with bacterial vaginosis and 9 mothers with urinary tract infections (UTIs). Three of the mothers with UTIs had urine cultures positive for group B beta strept.

House to House: A Community Initiative

Women with poor birth outcomes could potentially benefit from interventions to improve maternal health in the preconception and inter-conception period. Jackson County's Prenatal Task Force recently implemented the House to House Program, a peer education program for preconception and inter-conception health education in targeted high-risk communities where the largest numbers of infant deaths occur. Small groups of men and women of childbearing age gather in local homes or community buildings where a trained peer educator leads discussions related to health conditions and health behaviors that impact pregnancy outcomes.

Percent of Jackson County Infant Deaths
Reviewed by Maternal Psychosocial Factors,
2002-2006 (n=84)

Factor	Number of deaths	Percent of deaths
Multiple Stressors	49	58
Mental Health Issues	41	49
Lack of Social Support	33	39
Recent/Frequent Move	30	36
Domestic Abuse	18	21
Child Abuse or Neglect	14	17

Social Factors

Social factors continued to present as significant maternal risk factors in poor pregnancy outcomes. One out of every two women with an infant death identified multiple stressors and depression either during pregnancy or postpartum. Medicaid health insurance was more prevalent in mothers with multiple stressors (84%) and depression (68%) than private health insurance. One in four of the mothers with depression were referred for mental health services and almost half of the mothers with depression participated in the Maternal Infant Health Program (MIHP). MIHP is a support and education program targeted toward high-risk, pregnant and postpartum women. 53% of African American women suffered from depression and 48% of Caucasion women suffered from depression.

Domestic abuse with a current partner was present in one in five mothers experiencing infant death. Another 40 % had a history of violence with either their current partner, a past partner or parent.

Seventeen percent of mothers had a history of child abuse or neglect of another child.

Percent of Jackson County Infant Deaths Reviewed by Substance Use by Mom, 2002-2006 (n=84)

Substance	Number of deaths	Percent of deaths
Tobacco Use	46	55
Drank Alcohol while pregnant	10	12
Drug Use while pregnant	13	15

Substance Use

In 2006, 21.5% of Jackson County women smoked during their pregnancy compared to 13.8% of Michigan women. For Jackson County women with an infant death, 55% smoked during their pregnancy. Smoking was more prevalent among white women than African American women with an infant death. Smoking nearly doubles a woman's risk of having a low-birth weight baby and has long been known to slow fetal growth (MOD). Studies suggest that smoking also increases the risk of preterm delivery (MOD). In 2006 through a grant from the March of Dimes, the FIMR program started the Prenatal Smoking Cessation Program targeted at low income pregnant women. Referrals for the program are from Women, Infants, and Children (WIC) program, Maternal Infant Health program (MIHP), and private physicians.

Roughly one in ten women with an infant death used alcohol or drugs during their pregnancy.

Almost ¾ of all women with an infant death were eligible for the Maternal Infant Health Program. Of these, 56% participated, 18% were eligible but not referred, and 25% were eligible but declined the services. These programs serve as an important link to other community services that support women and families.

Summary

In summary, infant mortality is a complex, multi-factorial issue that must be challenged on multiple fronts. Communities must ensure access to health care, health information, and education, in ways that empower individuals and families to become active participants in healthy lifestyles and behavioral choices. Julia Lathrop (Chief of Children's Bureau 1912) said that infant mortality is a social problem with medical consequences. We see from the data found in this report the frequency which psycho-social issues were present in mothers with poor perinatal outcomes. Below are highlights found through FIMR reviews of infant deaths.

- *Prematurity continues to be the leading cause of infant deaths.*
- *58% of black infant deaths and 47% of white infant deaths were related to prematurity.*
- *Maternal infection is a leading contributor to preterm delivery.*
- *Sleep- related deaths remain the leading cause of post-neonatal deaths.*
- *51% of all pregnancies that resulted in an infant death were unplanned and 59% of prematurity related deaths were unplanned.*
- *Maternal tobacco use was present in half the cases of infant death.*
- *Maternal psychosocial issues continued to be significant risk factors present in cases of infant death.*
- *Health care practitioners must continue the consistent screening of women for mental health issues, substance use, and domestic violence to ensure referral, assessment and treatment.*

Taking Recommendations to Action

The FIMR Case Review Team identified six priority areas of perinatal concern through infant death reviews. The six priority areas identified are:

1) *Decreasing the number of pregnancies resulting in preterm labor and deliveries*
2) *Decreasing maternal tobacco, alcohol, and drug exposure*
3) *Decreasing unintended pregnancies*
4) *Assuring consistent assessment and referral for domestic violence and mental health concerns*
5) *Increasing awareness of safe infant sleep practices*
6) *Improving collection and use of vital statistical information related to infant mortality.*

The Prenatal Task Force's (FIMR's Community Action Team) strategic action plan is based on the above recommendations The action plan is meant to be a dynamic and fluid guide for reducing infant mortality and improving perinatal service systems in the Jackson Community, responding to new inputs and evaluations. Data obtained through 2006 reviews continues to support the initial 2002-03 recommendations with additional emphasis on:

-Continued emphasis on the need for a community educational campaign on how health behaviors, folic acid, pregnancy intervals, and preterm labor impact pregnancy outcomes and, educate women to take a more active role in health care
-Continue automatic referral to hospital case management for all moms with; infant death or infant transfer to a high-risk center for moms with a history of depression, substance use, or domestic violence
-Continued support to local OB offices to utilize the standardized psycho-social screening tool on consistent basis and expansion of the tool to family practice physicians and pediatricians
-Facilitate a community wide provider in-service on perinatal depression and perinatal addiction
-Continue to support a prenatal smoking cessation program in Jackson County
-Support AAP recommendation of well-child check up at 1 week of age, explore with local hospital policy for telephone follow up to remind parents to make 1 week appointment for baby
-Work with local hospital on possibility of Tdap immunization for all postpartum mothers
-Prenatal Task Force Coordinator to present bi-annual updates at local OB staff meeting

Acknowledgements

Many thanks to the members of the Case Review Team who have volunteered many hours of their time and energy over the last 5 years in reviewing cases of infant death in our community and to the members of Jackson County Prenatal Task Force for their hard work and perseverance in the development and implementation of the strategic plan for community action. Additionally, my appreciation and thanks to the mothers and families who have participated in the FIMR interview and shared 'their story' in the hopes of reducing infant mortality in the Jackson Community and improving services for all families.

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