

Fetal Infant Mortality Review

TARRANT COUNTY

*Study findings and recommendations from
the Tarrant County FIMR Case Review Team,
2008-2015*

NOVEMBER 2017



**Tarrant County
Public Health**

Accountability. Quality. Innovation.

Fetal Infant Mortality Review Tarrant County, 2008-2015



Tarrant County Public Health

Accountability. Quality. Innovation.

PUBLIC HEALTH DIRECTOR
VEERINDER (VINNY) TANEJA, MBBS, MPH

LOCAL HEALTH AUTHORITY & MEDICAL DIRECTOR
CATHERINE A. COLQUITT, M.D.

Report produced by the
Division of Epidemiology and Health Information
Communicable Disease Reporting: (817) 321-5350

Tarrant County Public Health

Accountability. Quality. Innovation.



A healthier community through leadership in health strategy

1101 S. Main Street • Fort Worth, Texas 76104 • (817) 321-4700

<http://health.tarrantcounty.com>

Fetal-Infant Mortality Review Report Team

Kristin McElroy, MPH
MCH Epidemiologist
Tarrant County Public Health

Micky M. Moerbe, MPH, CPH
Biostatistician
Tarrant County Public Health

Acknowledgements

Special thanks to the Tarrant County FIMR Case Review Team and all those who assisted with this project.

Suggested Citation

Fetal Infant Mortality Review, Tarrant County: Study findings and recommendations from the Tarrant County FIMR Case Review Team, 2008-2015. Tarrant County Public Health, November 2017.

TABLE OF CONTENTS

I. Introduction	1
II. Key Findings	2
A. Maternal Characteristics.....	2
B. Prenatal Care	3
C. Maternal Risk Factors	7
D. Labor and Delivery.....	10
E. Fetal-Infant Characteristics	11
F. Fetal-Infant Risk Factors and Leading Causes of Death	14
G. Cost of Care, Access to Care, and Quality of Care	18
H. Parental Interviews	19
III. Case Review Team Recommendations.....	27
 <u>FIGURES AND TABLES</u>	
Figure 1: FIMR process model.....	1
Figure 2: Number of fetal/infant deaths examined each year by the FIMR Case Review Team, Tarrant County, 2008-2015	2
Figure 3: Maternal demographics, Tarrant County FIMR cases, 2008-2015.....	3
Figure 4: Trimester prenatal care began, Tarrant County FIMR cases, 2008-2015	3
Figure 5: Trends in prenatal care, Tarrant County FIMR cases, 2008-2015	4
Figure 6: Prenatal care by race/ethnicity, Tarrant County FIMR cases, 2008-2015.....	4
Figure 7: Insurance coverage, Tarrant County FIMR cases, 2008-2015	4
Figure 8: Insurance coverage trends, Tarrant County FIMR cases, 2008-2015	5
Figure 9: Prenatal care by insurance type, Tarrant County FIMR cases, 2008-2015	5
Figure 10: Number of previous pregnancies, Tarrant County FIMR cases, 2008-2015	5
Figure 11: Prenatal risk assessment levels, Tarrant County FIMR cases, 2008-2015	6
Figure 12: Trends in prenatal risk assessments, Tarrant County FIMR cases, 2008-2015	6
Figure 13: Pre-pregnancy weight status, Tarrant County FIMR cases, 2008-2015.....	7
Figure 14: Trends in pre-pregnancy weight, Tarrant County FIMR cases, 2008-2015	7
Figure 15: Pre-pregnancy weight by race/ethnicity, Tarrant County FIMR cases, 2008-2015.....	8
Figure 16: Substance abuse during pregnancy by race/ethnicity, Tarrant County FIMR cases, 2008-2015	9
Figure 17: Labor status, Tarrant County FIMR cases, 2008-2015	10
Figure 18: Mode of delivery, Tarrant County FIMR cases, 2008-2015.....	10
Figure 19: Gestational age at birth, Tarrant County FIMR cases, 2008-2015.....	11
Figure 20: Trends in gestational age at birth, Tarrant County FIMR cases, 2008-2015	11
Figure 21: Gestational age at birth by race/ethnicity, Tarrant County FIMR cases, 2008-2015	12
Figure 22: Birth weight, Tarrant County FIMR cases, 2008-2015.....	12
Figure 23: Trends in birth weight, Tarrant County FIMR cases, 2008-2015	13
Figure 24: Birth weight by race/ethnicity, Tarrant County FIMR cases, 2008-2015	13
Figure 25: Age at death, Tarrant County FIMR cases, 2008-2015.....	14
Figure 26: Trends in age at death, Tarrant County FIMR cases, 2008-2015	15
Figure 27: Age at death by race/ethnicity, Tarrant County FIMR cases, 2008-2015	15
Figure 28: Systems of care issues identified among Tarrant County FIMR cases, 2008-2015	18
Figure 29: Parental interviews, Tarrant County FIMR cases, 2008-2015	19
Figure 30: Trends in parental interviews, Tarrant County FIMR cases, 2008-2015	20
Figure 31: Paternal demographics, Tarrant County FIMR cases, 2008-2015.....	20
Figure 32: Mother’s description of their relationship with the father of their baby, Tarrant County FIMR cases, 2008-2015.....	21
Table 1: Previous pregnancy outcomes, Tarrant County FIMR cases, 2008-2015	6
Table 2: Leading causes of death, Tarrant County FIMR cases, 2008-2015	16
Table 3: Leading causes of death by trimester prenatal care began, Tarrant County FIMR cases, 2008-2015	17
Table 4: Leading causes of death by year, Tarrant County FIMR cases, 2008-2015	17
Appendix: Tarrant County FIMR Case Review Team Members	30

I. INTRODUCTION

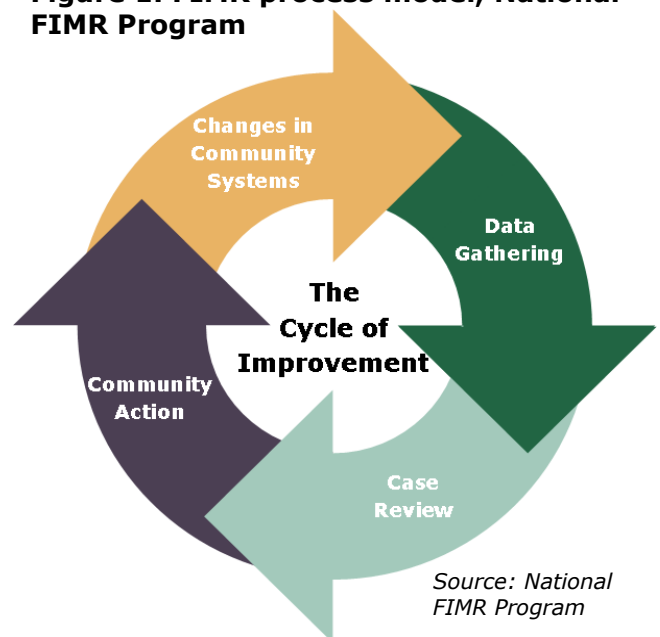
Infant mortality, the loss of a child before his or her first birthday, is a tragedy that forever impacts a mother, father, family, and community. The infant mortality rate (IMR) in Tarrant County fluctuates from year to year, but has seen an overall decline in the past 25 years. The IMR was 9.91 infant deaths per 1,000 live births in 1990 and declined 38% to 6.17 in 2015 (the most recent year data are available). While the 2015 rate of 6.17 was the lowest IMR in Tarrant County history, it was still higher than both Texas (5.63) and the United States (5.90), as well as the Healthy People 2020 Objective of 6.0 deaths per 1,000 live births.

In Tarrant County, just as across Texas and the United States, infants born to non-Hispanic black mothers die within the first year of life at a rate twice as high as infants born to non-Hispanic white mothers. In 2015, non-Hispanic blacks had the highest IMR rate in Tarrant County (9.59 per 1,000 live births), followed by Hispanics (6.60), other racial/ethnic groups (5.77), and non-Hispanic whites (4.34). However, notable improvements in birth outcomes among non-Hispanic black infants are reflected in recent findings. The IMR among non-Hispanic blacks in 2015 was an all-time low rate for this population and decreased over 40% since 2010 (16.62 infant deaths per 1,000 live births).

A wide variety of local stakeholders including health care providers, schools, faith-based organizations, government agencies, businesses, and volunteers are dedicated to lowering the IMR in Tarrant County. One illustration of this commitment to improving birth outcomes is the development and sustainment of the Tarrant County Fetal Infant Mortality Review (FIMR). Initiated locally in 2007, the FIMR process (Figure 1) incorporates an in-depth review of recent fetal and infant deaths in our community by a Case Review Team (CRT).

The CRT, a diverse assembly of professionals and representatives from agencies that provide services or community resources for families in Tarrant County, examines individual confidential and anonymous fetal/infant deaths by reviewing information collected from an array of sources. These sources include physician

Figure 1. FIMR process model, National FIMR Program



and hospital records, social service files, parent interviews, and other relevant documents. Based on their findings, the CRT then puts forth recommendations to prevent future losses, which are then implemented by a Community Action Team.

From 2008 through 2015, there were a total of 2,907 fetal/infant deaths reported in Tarrant County (45% fetal, 55% infant). Due to time and resource limitations, the CRT is unable to examine each fetal/infant death in our community. Therefore a systematic sampling method is employed to select cases for review. This report presents the results of detailed analyses of the selected de-identified fetal/infant deaths which occurred in Tarrant County from 2008 through 2015, as well as the subsequent CRT recommendations.

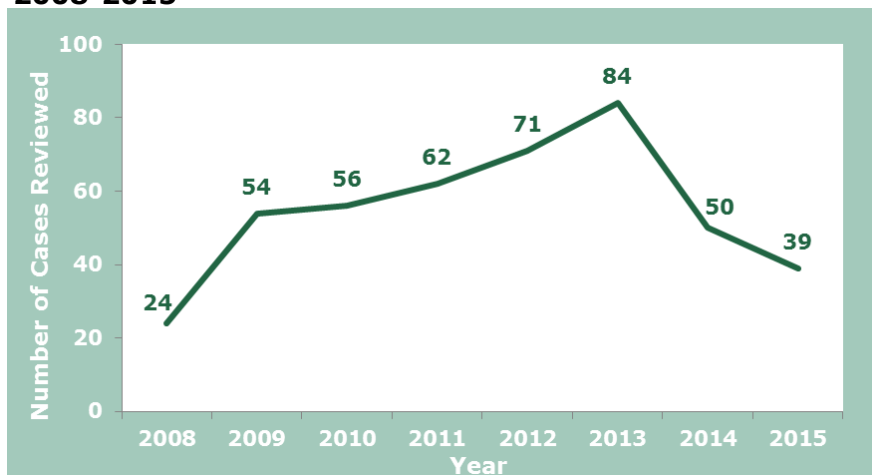
II. KEY FINDINGS

A. MATERNAL CHARACTERISTICS

The Tarrant County FIMR CRT examined 440 fetal and infant deaths born to 412 different Tarrant County residents during the calendar years of 2008 through 2015. Among the 412 FIMR mothers, 35% were Hispanic, 36% were non-Hispanic black, and 26% of the mothers were non-Hispanic white (Figure 3). Almost half (47%) of FIMR cases had a maternal age of 25 to 34 years, followed by those aged 18 to 24 years (29%), 35 years and older (18%), and lastly mothers aged less than 18 years (6%). Maternal ages ranged from 14 to 46 years and the average maternal age for all reviewed cases was 27.6 years. Fifteen percent of the mothers had not completed high school and 58% of mothers were not married. English was the primary language spoken among 68% of cases and 16% predominantly spoke Spanish. Fourteen percent of all cases had no

documentation of language preference therefore these results should be viewed with caution.

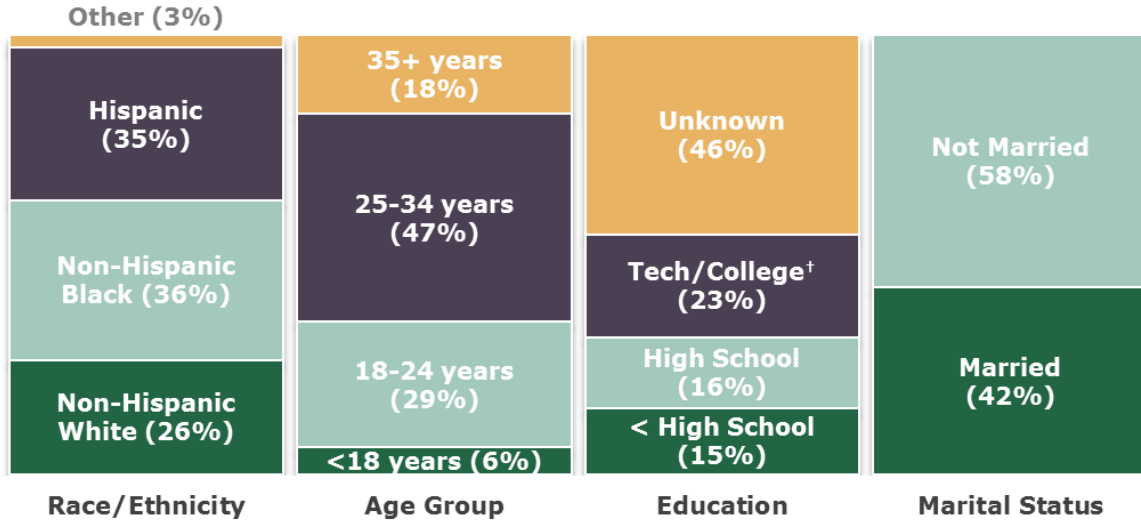
Figure 2. Number of fetal/infant deaths examined each year by the FIMR Case Review Team, Tarrant County, 2008-2015



Data source: Tarrant County Public Health



Figure 3. Maternal demographics, Tarrant County FIMR Cases, 2008-2015

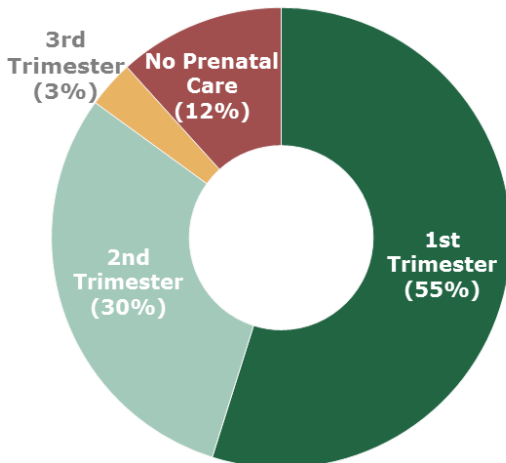


[†] Includes both graduates and non-graduates
 Among all mothers (n=412)
 Data source: Tarrant County Public Health

B. PRENATAL CARE

Fifty-five percent of FIMR mothers started prenatal care in the first trimester, falling short of the Healthy People 2020 Objective of 78%. A third of FIMR mothers were late to care and 12% reported obtaining no prenatal care during the course of their pregnancy (Figure 4). Trends in prenatal care initiation among FIMR cases can be seen in Figure 5. The differences in prenatal care initiation by race/ethnicity can be seen in Figure 6.

Figure 4. Trimester prenatal care began, Tarrant County FIMR cases, 2008-2015

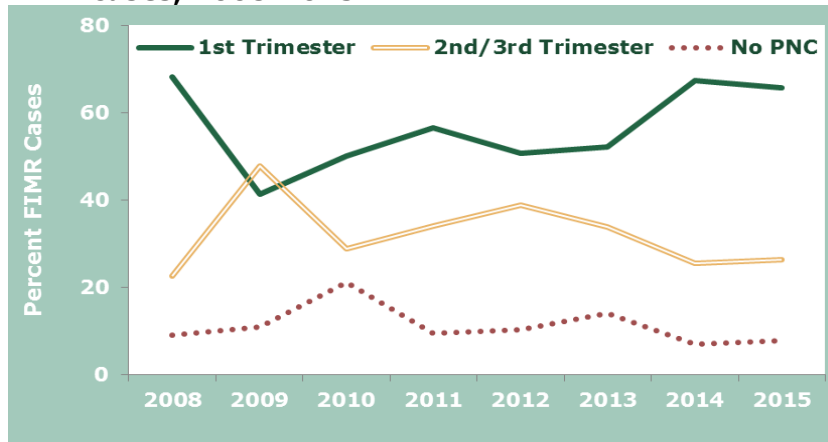


Among all mothers (n = 412)
 Data source: Tarrant County Public Health

Insurance coverage is a key determinant in acquiring prenatal care. Medicaid was the most frequent source of medical funding among FIMR cases (52%). A third of mothers held private insurance plans (31%) and the remaining cases either paid for services out-of-pocket (13%) or reported other sources of payment (5%) (Figure 7). Over time, Medicaid coverage increased among FIMR mothers while private insurance decreased, except in 2015 when private insurance increased and Medicaid coverage decreased (Figure 8).

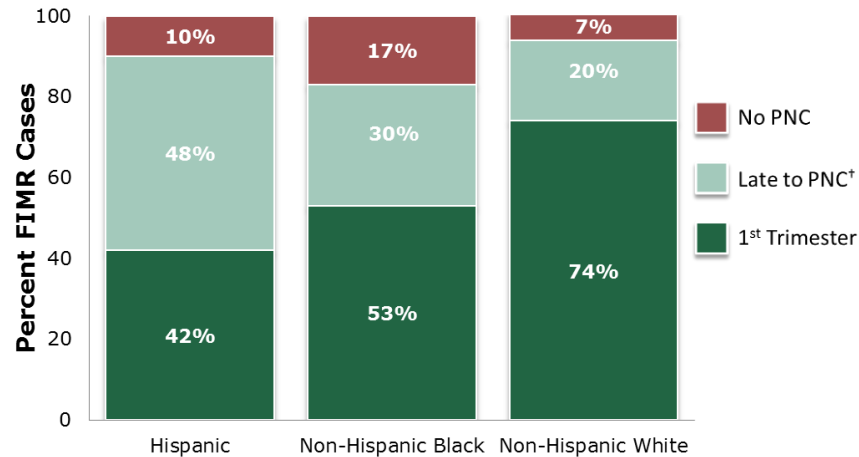


Figure 5. Trends in prenatal care, Tarrant County FIMR cases, 2008-2015



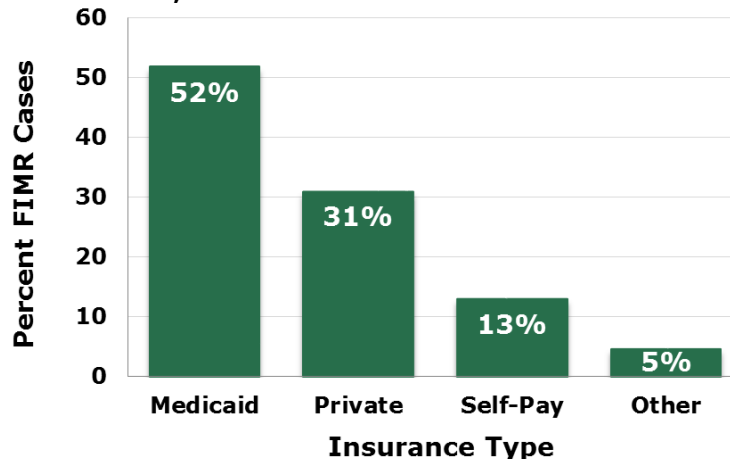
Among all mothers (n = 412)
Data source: Tarrant County Public Health

Figure 6. Prenatal care by race/ethnicity, Tarrant County FIMR cases, 2008-2015



Among all mothers (n = 412); †Prenatal care began in 2nd or 3rd trimester
Data source: Tarrant County Public Health

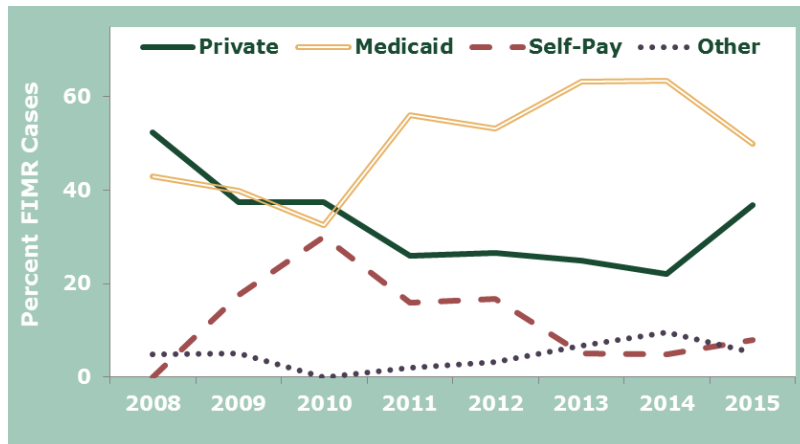
Figure 7. Insurance coverage, Tarrant County FIMR cases, 2008-2015



Among all mothers (n = 412)
Data source: Tarrant County Public Health

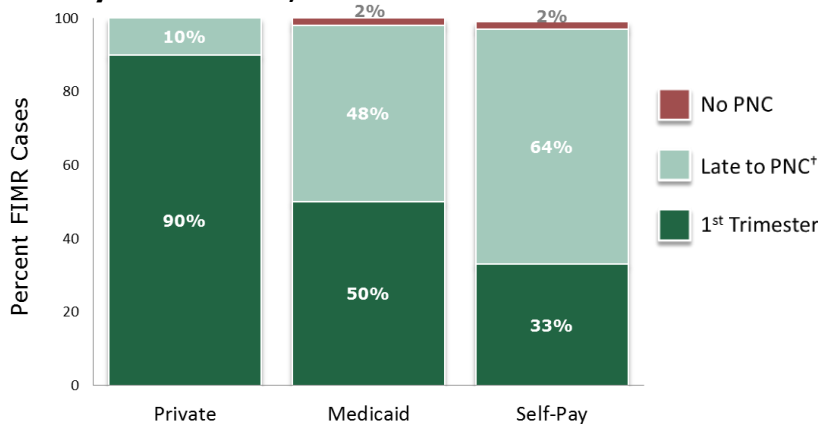


Figure 8. Insurance coverage trends, Tarrant County FIMR cases, 2008-2015



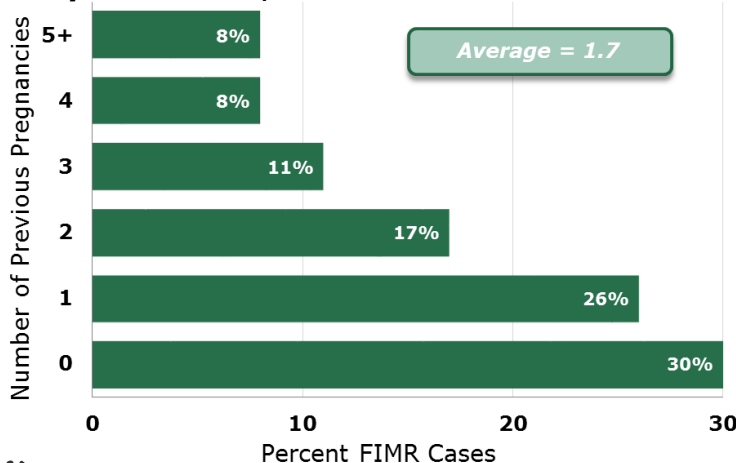
Among all mothers (n = 412)
Data source: Tarrant County Public Health

Figure 9. Prenatal care by insurance type, Tarrant County FIMR cases, 2008-2015



Among all mothers (n = 412); *Prenatal care began in 2nd or 3rd trimester
Data source: Tarrant County Public Health

Figure 10. Number of previous pregnancies, Tarrant County FIMR cases, 2008-2015



Among all mothers (n = 412)
Data source: Tarrant County Public Health



Prenatal care initiation among 2008-2015 FIMR cases varied significantly by insurance type. Ninety percent of those with private insurance began prenatal care in the first trimester compared to 50% of those receiving Medicaid and 33% of self-pay cases (Figure 9). Despite these differences, it is important to keep in mind that unfortunately, regardless of when prenatal care began, all cases resulted in a fetal or infant death. This is not to diminish the importance of prenatal care to positive birth outcomes, but to highlight the complexity of fetal/infant loss and that early prenatal care is not a solitary solution to this tragedy.

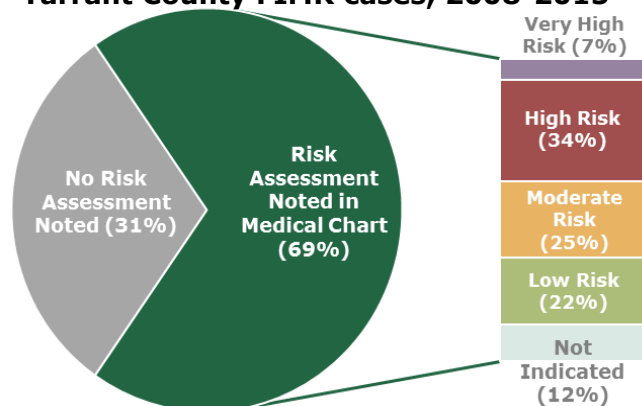
The number of previous pregnancies among FIMR mothers ranged from none to ten with an average of 1.7 (Figure 10). Among mothers with a previous pregnancy, 80% had a previous premature birth and 73% had a previous full term birth. A complete list of previous pregnancy outcomes is provided in Table 1.

Table 1. Previous pregnancy outcomes, Tarrant County FIMR cases, 2008-2015

Outcome	Percent
Premature Birth	80
Full Term Birth	73
Spontaneous Abortion	38
Induced Abortion	16
Multiple Birth	11
Ectopic Pregnancy	5
Living Children	85
One	41
Two	26
Three or More	17

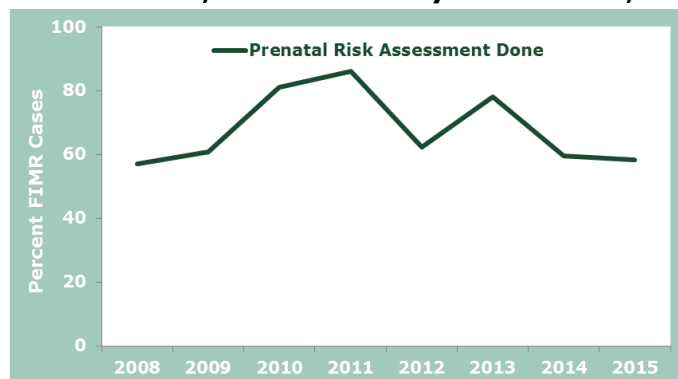
Among mothers with a previous pregnancy (n = 268)
Data source: Tarrant County Public Health

Figure 11. Prenatal risk assessment levels, Tarrant County FIMR cases, 2008-2015



Among mothers that received prenatal care (n = 357)
Data source: Tarrant County Public Health

Figure 12. Trends in prenatal risk assessments, Tarrant County FIMR cases,



Among mothers that received prenatal care (n = 357)
Data source: Tarrant County Public Health

A vital component in providing proper medical management throughout pregnancy is identifying high risk patients by means of a prenatal risk assessment. Sixty-nine percent of FIMR mothers who received prenatal care had documentation of a prenatal risk assessment, typically performed during the first prenatal care visit. Of those assessed, 7% were identified as very high risk, 34% high risk, 25% moderate risk, 22% low risk, and the remaining 12% did not have their risk level recorded (Figure 11). Cases with documentation of a reassessment at 28 weeks were limited due in part to the number of mothers who lost their infants before that gestational age. The percentage of reviewed cases who obtained a prenatal risk assessment fluctuated from year to year with no discernable trend (Figure 12). Risk assessments will continue to be monitored as more cases are investigated to determine if this improves.

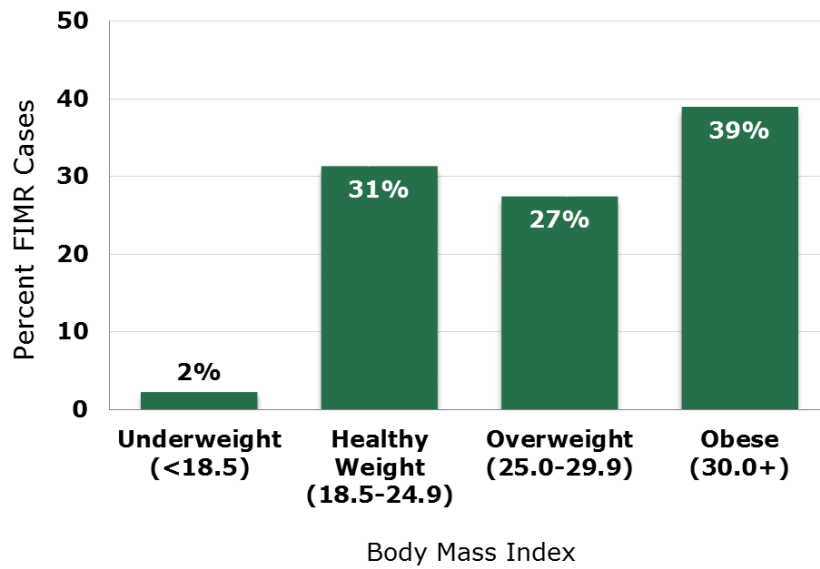
Although the vast majority of FIMR mothers did not miss a scheduled prenatal care visit, the percentage of those who attended all appointments did decline slightly across trimesters. During the first trimester of pregnancy, 97% of mothers attended all scheduled visits. Attendance fell to 93% in the second trimester and increased slightly to 94% in the third. Reasons for missing prenatal care appointments could not be derived from available data.



C. MATERNAL RISK FACTORS

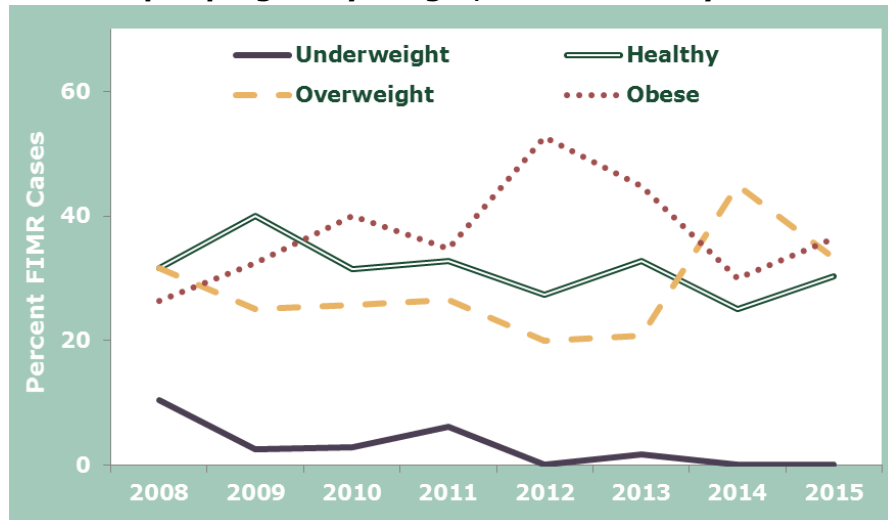
The most prevalent maternal health risk observed within the Tarrant County FIMR cohort was unhealthy weight status, affecting 68% of mothers. Two percent began their pregnancies underweight, 27% were classified as overweight, and 39% of mothers were characterized as obese (Figure 13). Dietitian referrals were documented among 14% of obese mothers and 9% of overweight mothers; however, no dietitian referrals were noted among mothers who were underweight. Although it varied year-to-year, the majority of FIMR mothers were classified as overweight or obese each year, ranging from 58% to 75% (Figure 14). Fifty percent of non-Hispanic black FIMR mothers were classified as obese before pregnancy compared to one-third of both Hispanic and non-Hispanic white mothers (Figure 15).

Figure 13. Pre-pregnancy weight status, Tarrant County FIMR cases, 2008-2015



Among all mothers (n = 412)
Data source: Tarrant County Public Health

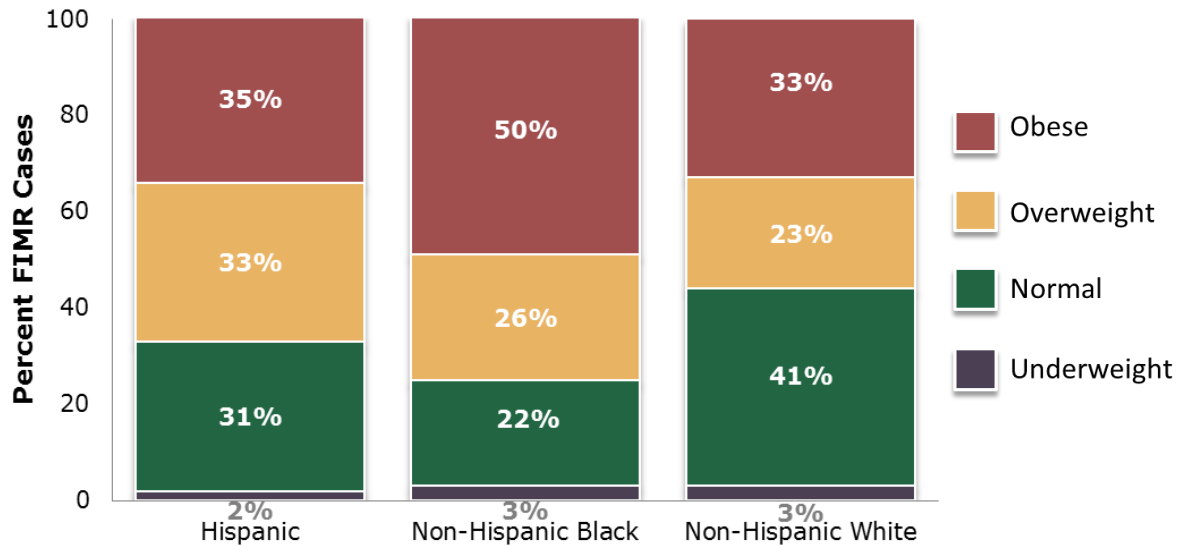
Figure 14. Trends in pre-pregnancy weight, Tarrant County FIMR cases, 2008-2015



Among all mothers (n = 412)
Data source: Tarrant County Public Health



Figure 15. Pre-pregnancy weight status by race/ethnicity, Tarrant County FIMR cases, 2008-2015



Among all mothers (n = 412)
Data source: Tarrant County Public Health

Sixty-seven percent of mothers had evidence of a significant medical problem *predating* this pregnancy. The most common issues among this subgroup were:

- sexually transmitted diseases (24%)
- hypertension (17%)
- asthma (16%)
- iron deficiency anemia (15%)
- depression (14%)

Seventy percent of mothers had evidence of a significant medical problem *during* this pregnancy.

The most common issues among this subgroup were:

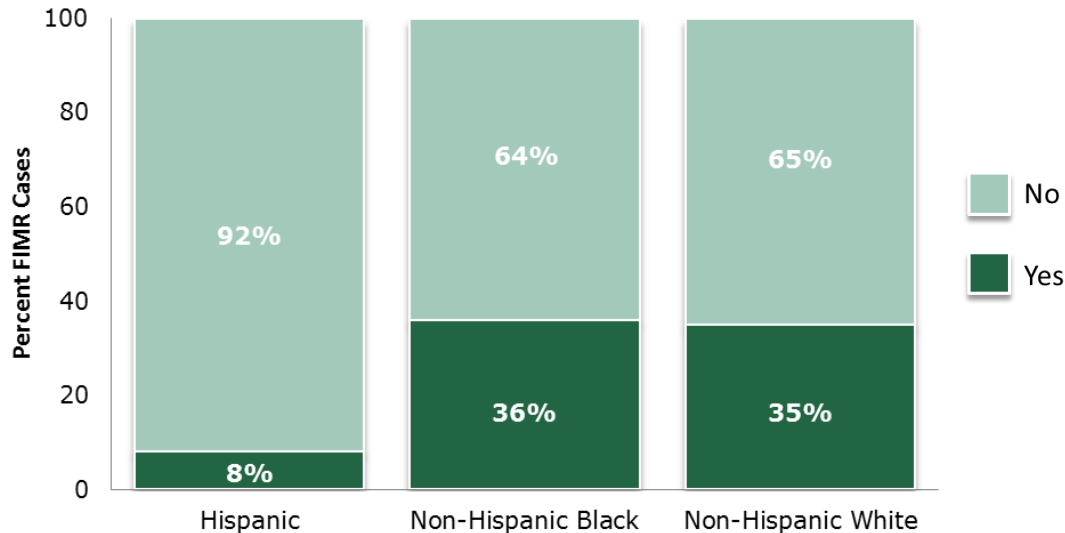
- urinary tract infections (17%)
- hypertension (15%)
- incompetent cervix, iron deficiency anemia (14% each)
- sexually transmitted diseases (11%)
- bacterial vaginitis (10%)

Substance abuse during pregnancy was identified in approximately 25% of FIMR cases, but due to self-reporting, is considered an underestimation of actual use. Eighteen percent of mothers confirmed the use of tobacco and 4% consumed alcohol while pregnant. Illicit drug use was identified in 12% of mothers, mostly due to detection by medical screening. Illicit drugs used during pregnancy



included cannabis, cocaine, heroin, and methamphetamine. Substance abuse during pregnancy varied by race/ethnicity, being reported in slightly over one-third of both non-Hispanic black and non-Hispanic white FIMR mothers compared with 8% of Hispanic FIMR mothers (Figure 16).

Figure 16. Substance abuse during pregnancy by race/ethnicity, Tarrant County FIMR cases, 2008-2015[†]



*Among all mothers (n = 412; [†]Includes the use of tobacco, alcohol, or illicit drug use during pregnancy)
Data source: Tarrant County Public Health*

Medical, social work, or other personnel identified the following psychological or lifestyle problems in less than five percent of FIMR mothers during the prenatal course:

- alcohol abuse
- battered mother
- communication difficulties (no phone)
- crime / legal problems
- history of child abuse (other children)
- housing inadequate / homeless
- mother abused as child
- physical / developmental handicap (mother/partner/child)
- transportation limitations

The low percentage of mothers with known psychological or lifestyle problems is encouraging on one hand, but on the other may suggest that these issues are not addressed or taken into consideration as an essential component of prenatal screenings by health professionals in our community. More research is needed to better quantify this uncertainty.

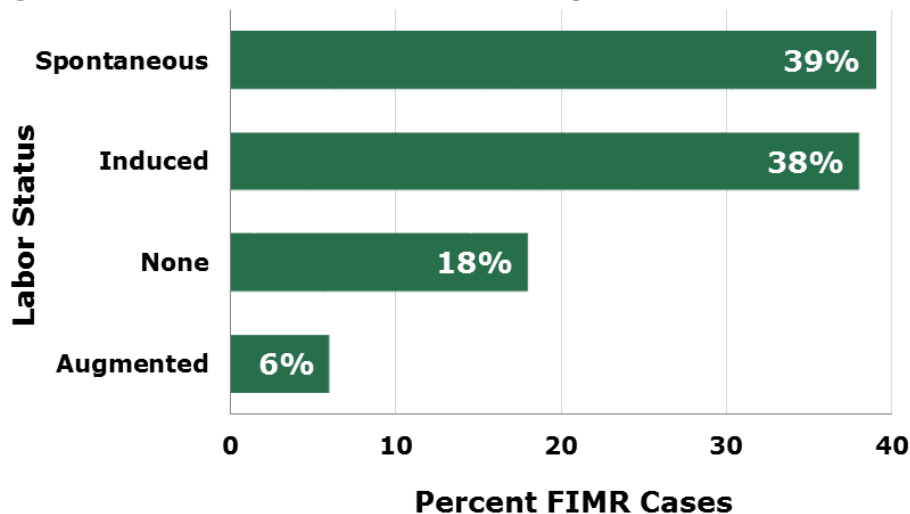


D. LABOR AND DELIVERY

Two out of five FIMR deliveries were spontaneous (not induced or augmented) and two-thirds of all births were by spontaneous vaginal delivery (Figures 17 and 18). Ninety percent of births had documentation of a significant medical or obstetric problem during labor and delivery or in the postpartum period. The most frequently reported were:

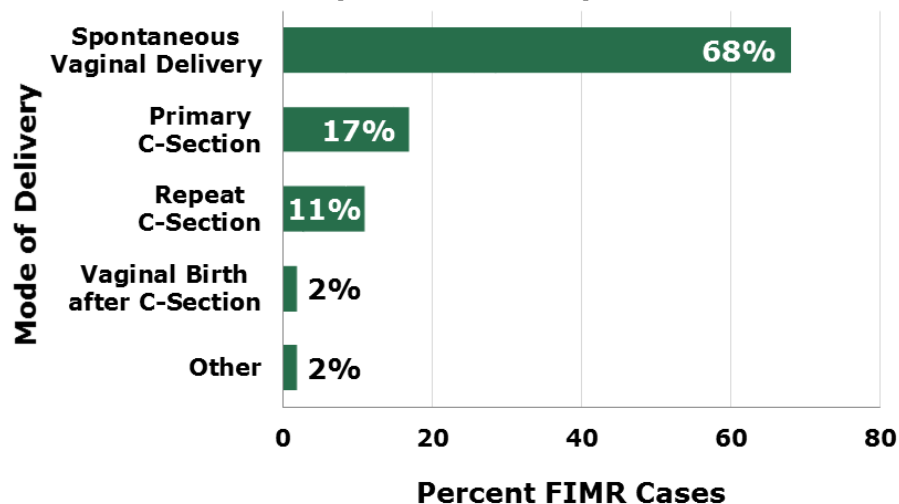
- fetal demise (59%)
- premature labor (29%)
- chorioamnionitis (17%)
- multiple pregnancy, previous C-section (14% each)
- oligohydramnios (13%)

Figure 17. Labor status, Tarrant County FIMR cases, 2008-2015



Among all fetal/infant deaths (n = 440)
Data source: Tarrant County Public Health

Figure 18. Mode of delivery, Tarrant County FIMR cases, 2008-2015



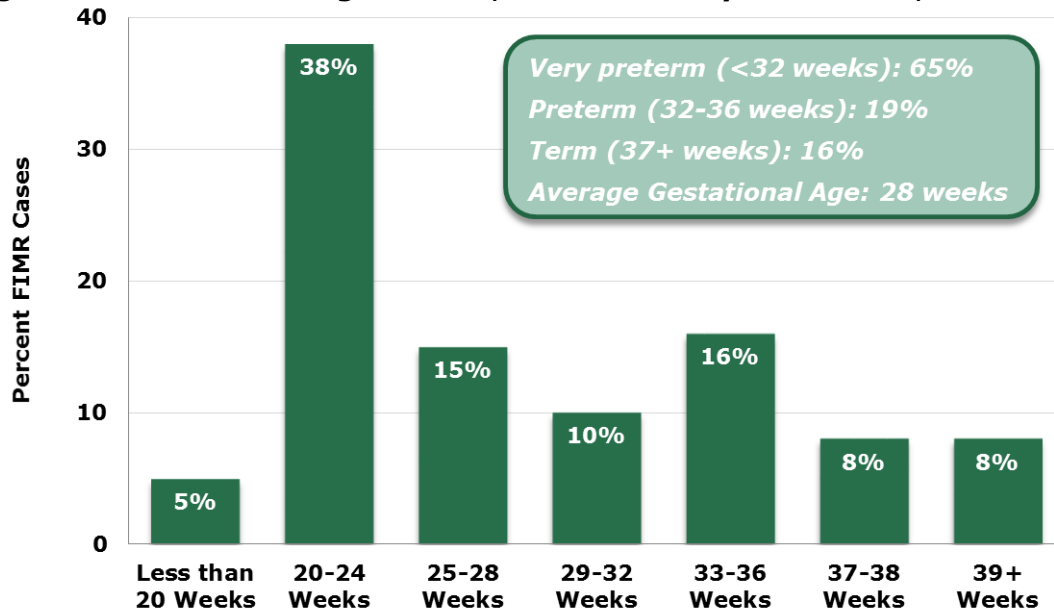
Among all fetal/infant deaths (n = 440)
Data source: Tarrant County Public Health



E. FETAL-INFANT CHARACTERISTICS

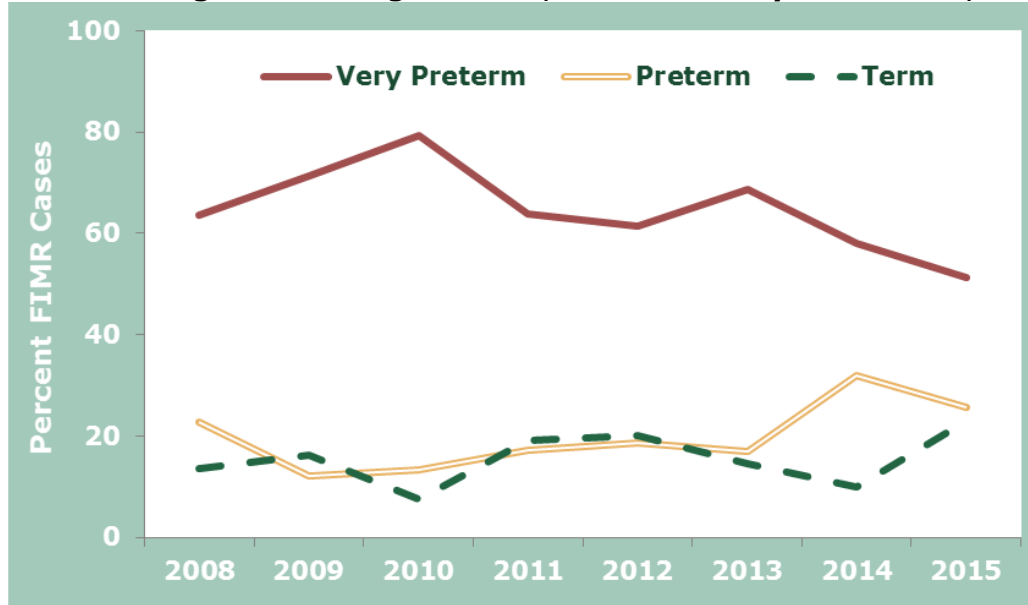
The majority of all FIMR cases were male (52%). Sixty-five percent were born very premature (gestational age of less than 32 weeks), with the largest percentage of cases in the 20-24 week age group (38%). The mean gestational age among all FIMR cases was 28 weeks (Figure 19). Trends in gestational age from 2008-2015 are shown in Figure 20. Differences in gestational age by race/ethnicity are shown in Figure 21.

Figure 19. Gestational age at birth, Tarrant County FIMR cases, 2008-2015



Among all fetal/infant deaths (n = 440)
 Data source: Tarrant County Public Health

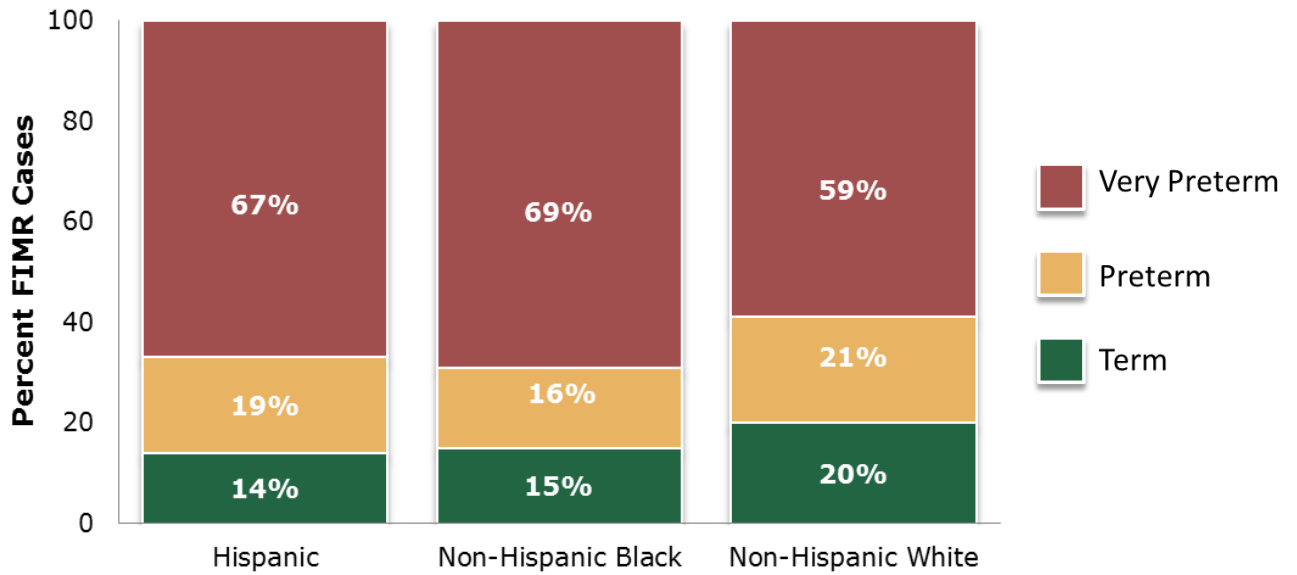
Figure 20. Trends in gestational age at birth, Tarrant County FIMR cases, 2008-2015



Among all fetal/infant deaths (n = 440)
 Data source: Tarrant County Public Health



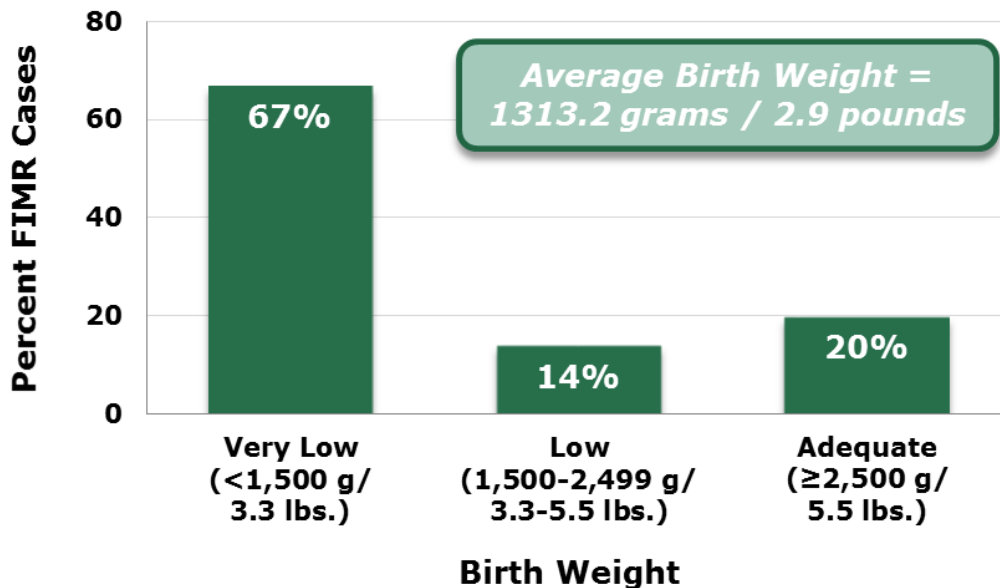
Figure 21. Gestational age at birth by race/ethnicity, Tarrant County FIMR cases,



Among all fetal/infant deaths (n = 440)
Data source: Tarrant County Public Health

Sixty-seven percent of all FIMR cases were very low birth weight (less than 1,500 g/3.3 lbs.), 14% were low birth weight (1,500-2,499 g/3.3 lbs.–5.5 lbs.), and 20% had an adequate birth weight (greater than 2,500 g/5.5 lbs.) (Figure 22). The average birth weight among all cases was 1,313.2 g (or 2.9 lbs.). The percentage of very low birth weight cases decreased overtime, as those of adequate weight increased (Figure 23). Differences in birth weight by race/ethnicity are shown in Figure 24.

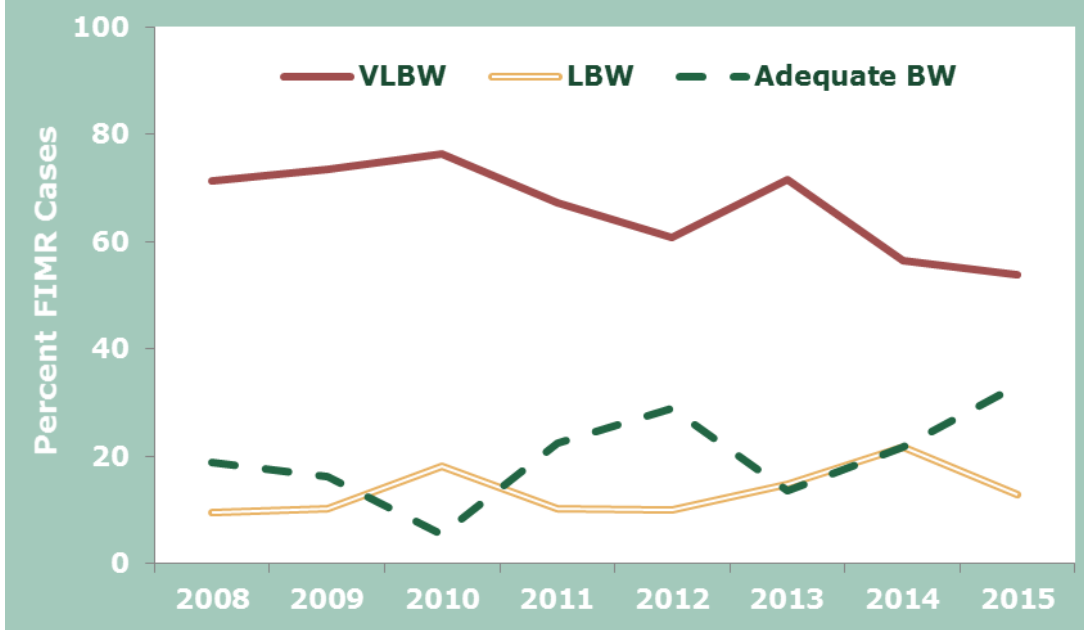
Figure 22. Birth weight, Tarrant County FIMR cases, 2008-2015



Among all fetal/infant deaths (n = 440)
Data source: Tarrant County Public Health

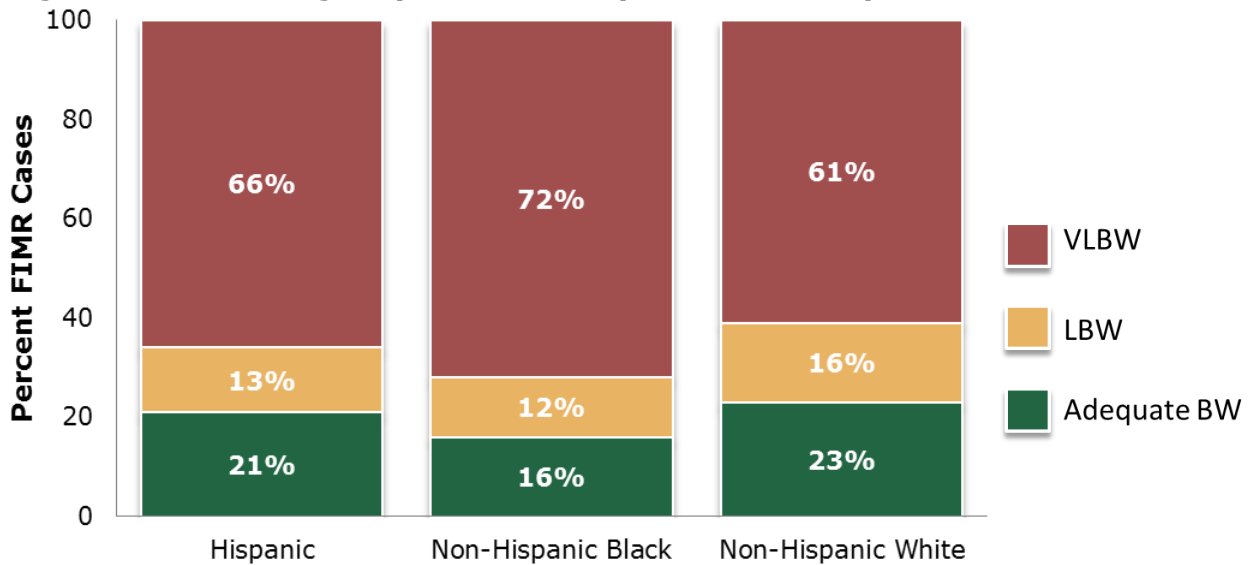


Figure 23. Trends in birth weight, Tarrant County FIMR cases, 2008-2015



Among all fetal/infant deaths (n = 440)
 VLBW=Very Low Birth Weight=<1500g; LBW=Low Birth Weight=1500-2499g; Adequate BW=2500+g
 Data source: Tarrant County Public Health

Figure 24. Birth weight by race/ethnicity, Tarrant County FIMR cases, 2008-2015



Among all fetal/infant deaths (n = 440)
 Data source: Tarrant County Public Health

Over 80% of FIMR cases were deceased before discharge from their hospital of birth. Fifteen percent died after transfer to a neonatal intensive care unit. Four percent of FIMR cases went home with their parents before dying.



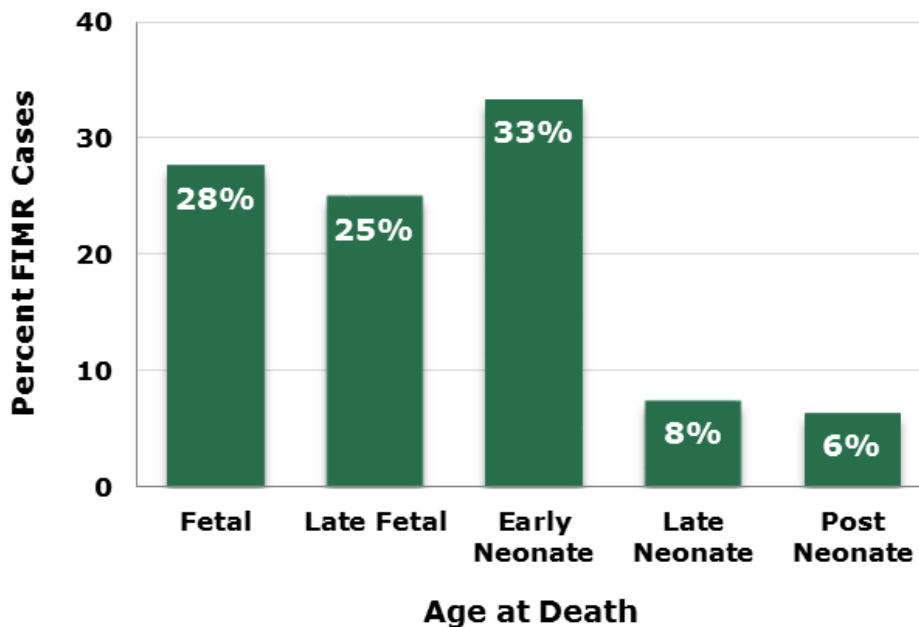
F. FETAL-INFANT RISK FACTORS AND LEADING CAUSES OF DEATH

Medical problems were documented among 86% of infant deaths with a hospital stay reviewed by the Tarrant County FIMR CRT. These included, but were not limited to:

- respiratory distress (47%)
- metabolic acidosis (33%)
- hypotonia (26%)
- jaundice (25%)
- delayed feeding adequacy (22%)

Among all reviewed cases, over half exhibited no signs of life at birth, however the largest percentage were classified as early neonate deaths (those born alive and then dying within less than seven days (33%). The smallest percentage of deaths were post neonate (those born alive and then dying 28 days to one year later (6%) (Figure 25). No stable trend was seen for age at death among cases from 2008-2015, with notable variation from year-to-year (Figure 26). Differences in age of death by race/ethnicity are shown in Figure 27.

Figure 25. Age at death, Tarrant County FIMR cases, 2008-2015



Fetal: born with no signs of life; 20-28 weeks gestation

Late Fetal: born with no signs of life; >28 weeks gestation

Early Neonate: born alive; died <7 days old

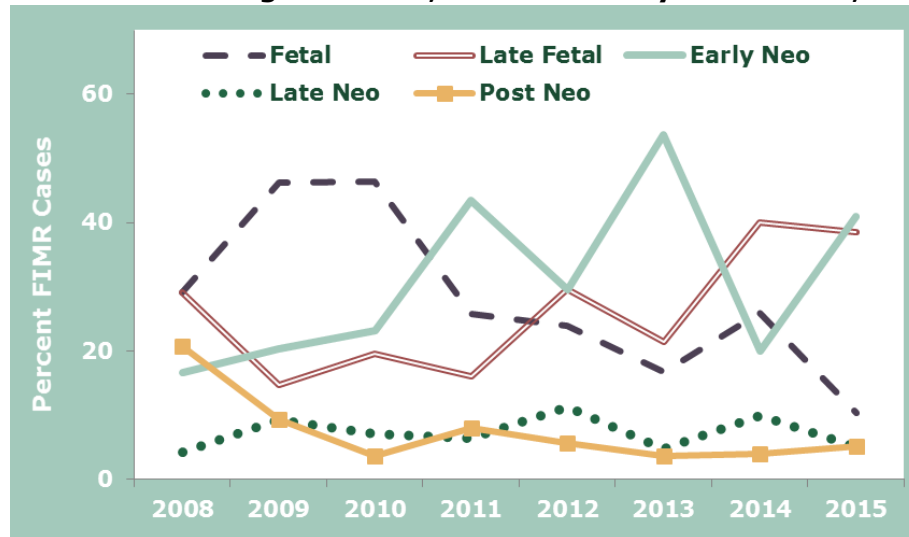
Late Neonate: born alive; died 7-27 days old

Post Neonate: born alive; died 28 days - 1 year old

*Among all fetal/infant deaths (n = 440)
Data source: Tarrant County Public Health*

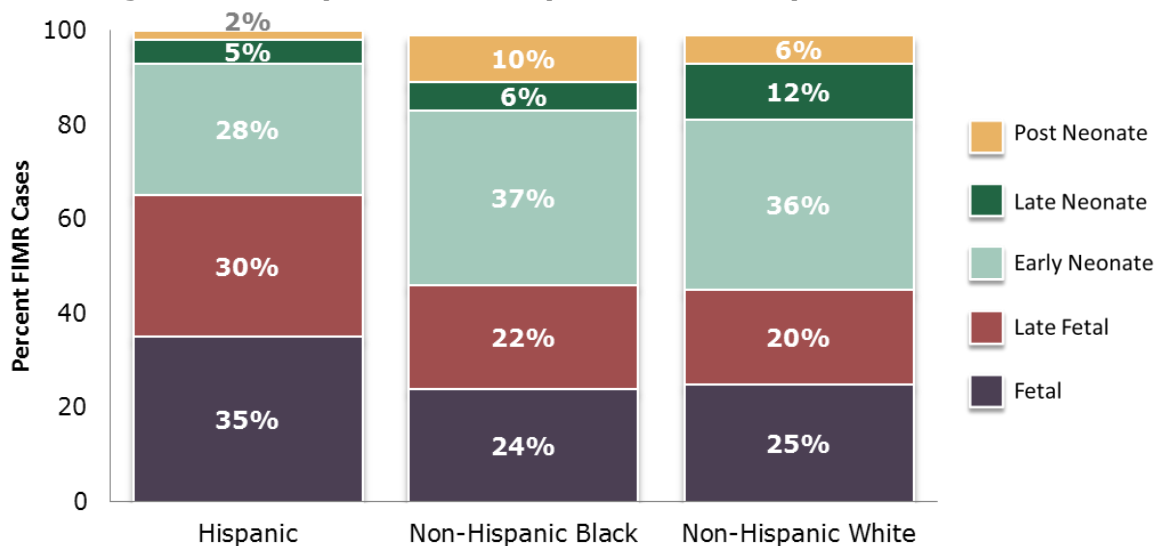


Figure 26. Trends in age at death, Tarrant County FIMR cases, 2008-2015



Among all fetal/infant deaths (n = 440)
Data source: Tarrant County Public Health

Figure 27. Age at death by race/ethnicity, Tarrant County FIMR cases, 2008-2015



Among all fetal/infant deaths (n = 440)
Data source: Tarrant County Public Health

Intrauterine fetal demise was identified as the cause of death in 20% of FIMR cases, the most frequent cause of death among reviewed cases. Other leading causes of death included newborn affected by complications of placenta, cord, and membranes (17%), disorders related to short gestation and low birth weight (16%), congenital malformations, deformations, and chromosomal abnormalities (14%), and newborn affected by maternal complications of pregnancy (14%) (Table 2).



Table 2. Leading causes of death, Tarrant County FIMR cases, 2008-2015

Cause of Death	Percent
Intrauterine Fetal Demise (unknown cause)	20
Newborn affected by complications of placenta, cord, and membranes	17
Disorders related to short gestation & low birth weight	16
Congenital malformations, deformation, and chromosomal abnormalities	14
Newborn affected by maternal complications of pregnancy	14
Sudden Infant Death Syndrome	3
Diseases of the circulatory system	2
Necrotizing enterocolitis of newborn	2
Respiratory distress of newborn	2
Newborn affected by maternal hypertensive disorders	1

*Among all fetal/infant deaths (n = 440)
Only those causes with five or more deaths provided
Data source: Tarrant County Public Health*

Cause of death was stratified by the trimester in which a mother began prenatal care in order to determine if trends emerged in relation to the two variables (Table 3). Disorders related to short gestations and low birth weight ranked as the leading cause of death among cases when the mother had no prenatal care at all. Newborns affected by maternal complications of pregnancy was the most common cause of death among cases who initiated prenatal care in the first trimester. Intrauterine fetal demise ranked first among those who began prenatal care in the second or third trimester. Cause of death for those beginning prenatal care in the third trimester should be interpreted with caution due to the small number of cases (n=13). The three leading causes of death for all cases (regardless of prenatal care initiation) for each FIMR year are shown in Table 4.



Table 3. Leading causes of death by trimester prenatal care began, Tarrant County FIMR cases, 2008-2015

Trimester Prenatal Care Began				
	No Prenatal Care (n=49)	1st Trimester (n=229)	2nd Trimester (n=126)	3rd Trimester (n=13)
Leading Causes of Death	Disorders related to short gestation & low birth weight (33%)	Newborn affected by complications of placenta, cord, and membranes (20%)	IUFD - cause unknown (24%)	IUFD - cause unknown (39%)
	IUFD - cause unknown / Newborn affected by maternal complications of pregnancy (14%)	IUFD - cause unknown (18%)	Newborn affected by maternal complications of pregnancy (18%)	Congenital malformations, deformations (31%)
	Newborn affected by complications of placenta, cord, and membranes (12%)	Disorders related to short gestation & low birth weight (16%)	Congenital malformations, deformations / Newborn affected by complications of placenta, cord, and	---

Data source: Tarrant County Public Health

Table 4. Leading causes of death by year, Tarrant County FIMR cases, 2008-2015

	2008 (n=21)	2009 (n=54)	2010 (n=56)	2011 (n=62)	2012 (n=71)	2013 (n=84)	2014 (n=50)	2015 (n=39)
Leading Causes of Death	Disorders related to short gestation & low birth weight (38%)	Disorders related to short gestation & low birth weight (32%)	IUFD - cause unknown (30%)	Newborn affected by maternal complications of pregnancy (23%)	IUFD - cause unknown (27%)	Newborn affected by complications of placenta, cord, & membranes (24%)	Newborn affected by complications of placenta, cord, & membranes (34%)	Newborn affected by complications of placenta, cord, & membranes (26%)
	Congenital malformations, deformations / IUFD - cause unknown (14%)	Congenital malformations, deformations (19%)	Disorders related to short gestation & low birth weight (27%)	IUFD - cause unknown (16%)	Newborn affected by complications of placenta, cord, & membranes (18%)	Newborn affected by maternal complications of pregnancy (20%)	IUFD - cause unknown (26%)	IUFD - cause unknown (23%)
	Necrotizing enterocolitis / Sudden Infant Death Syndrome (10%)	Newborn affected by maternal complications of pregnancy (13%)	Congenital malformations, deformations (16%)	Congenital malformations, deformations (15%)	Newborn affected by maternal complications of pregnancy (17%)	Disorders related to short gestation & low birth weight (16%)	Congenital malformations, deformations (12%)	Congenital malformations, deformations (18%)

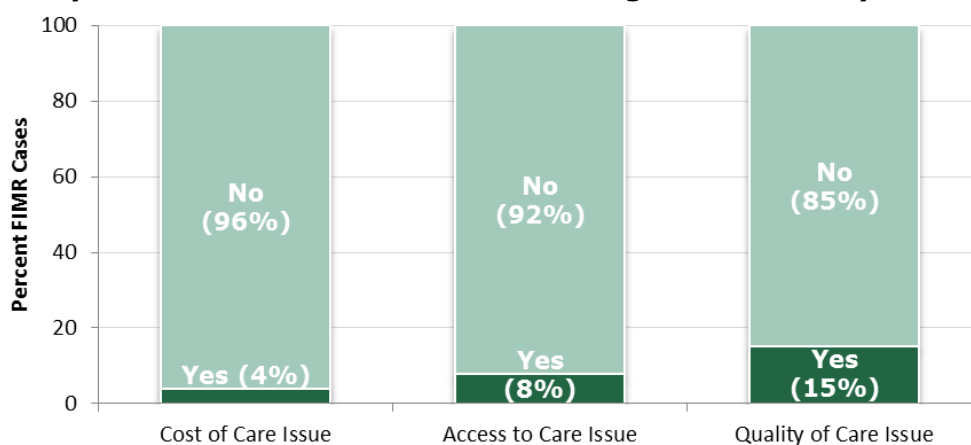
Data source: Tarrant County Public Health



G. COST OF CARE, ACCESS TO CARE, & QUALITY OF CARE

The CRT considers issues surrounding systems of care for each FIMR case it studies (Figure 28). Cost of care issues were identified in 4% of all cases. Examples of cost of care issues include a mother who did not see a Maternal Fetal Medicine specialist due to lack of insurance coverage and a mother who was unable to afford needed medicine due to cost.

Figure 28. Systems of care issues identified among Tarrant County FIMR cases, 2008-2015



Among all fetal/infant deaths (n = 440)
Data source: Tarrant County Public Health

Eight percent of all FIMR cases reported problems that limited their access to care. Delays in obtaining Medicaid/CHIP resulted in 4% of all cases being late to prenatal care or receiving no prenatal care at all. One mother described how she went to her first prenatal care visit, waited six hours without being seen, then left, never to return for care. Several women reported they were unable to get care for their diabetes, and one woman reported not having access to care in jail for a yeast infection.

The CRT determined approximately 15% of FIMR cases had problems with quality of care. Quality of care issues were classified as:

- management of care problems (7%) (e.g., no note of monitoring uterine fibroids, mother needed to be hospitalized for uncontrolled gestational diabetes, risk factors not managed)
- missed care opportunities (2%) (e.g., infant should have been tested for pertussis at first ER visit so treatment could have started earlier, no psychological assessment done, no follow up on chlamydia, congenital hypothyroidism not medicated)
- quality of staff or procedures (2%) (e.g., poor quality of sonograms, poor quality of Emergency Medical Technician)
- delay in appropriate care (1%) (e.g., cerclage should have been done sooner, mother should have been admitted at first ER visit reporting reduced fetal movement, late Maternal Family Medicine consult)



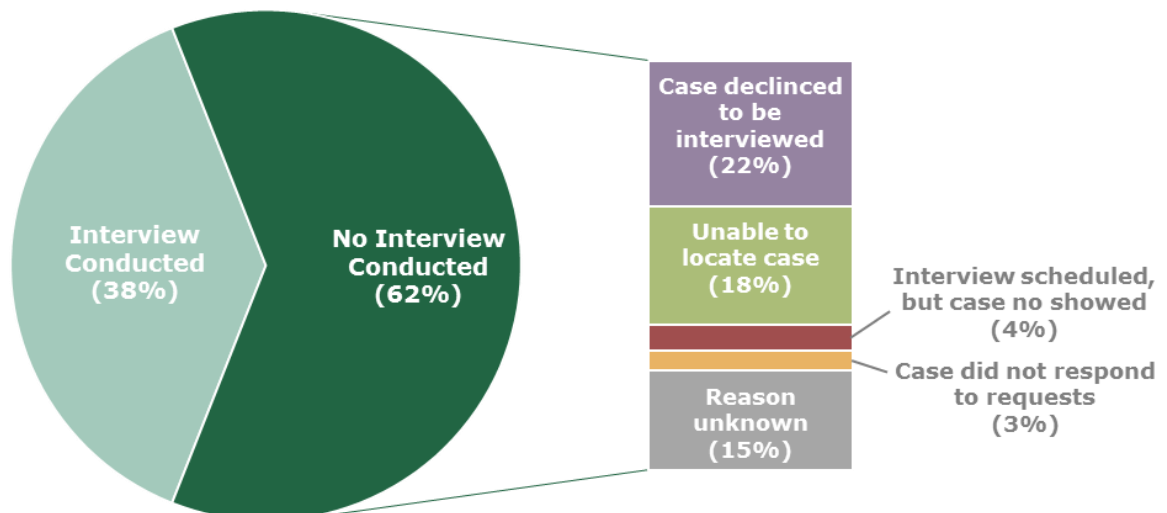
- caregiver approachability and interactions with patient (1%) (e.g., aggressive delivery nurse interaction, specialist not approachable, clinic staff lacked compassion)
- communication problems between caregivers (0.2%) (e.g., confusion by staff on plan of care for infant, communication with Maternal Fetal Medicine and OB/GYN inconsistent)

H. PARENTAL INTERVIEWS

One of the most valuable data sources within the FIMR process is the personal interview conducted with the family who lost their child. The interview captures details not found on a birth or death certificate or within the pages of a medical record. Although specific questions are provided for the interview, every effort is made to allow the family to speak only about things which they are comfortable; therefore scope and depth vary across participants and information available in one interview may not be present in another.

Thirty-eight percent of FIMR families provided a personal interview. The remaining 62% had no interview conducted; 22% were located, but declined to be interviewed, 18% could not be located based on information available in vital records or in the medical chart, 4% had an interview scheduled, but failed to show, and 3% did not respond to interview requests (Figure 29). Compared to those not interviewed, interviewed mothers were significantly more likely to begin their prenatal care in the first trimester (67% vs. 46%), to be married (59% vs. 33%), and to have private insurance (43% vs. 26%) ($p < 0.05$). No statistically significant differences were found by age group, race/ethnicity, language preference, or infant characteristics. The percentage of cases that provided an interview increased overall from 2009 (Figure 30). Tarrant County FIMR continues to engage the community and raise awareness around the FIMR process in hopes of obtaining more interviews among reviewed cases.

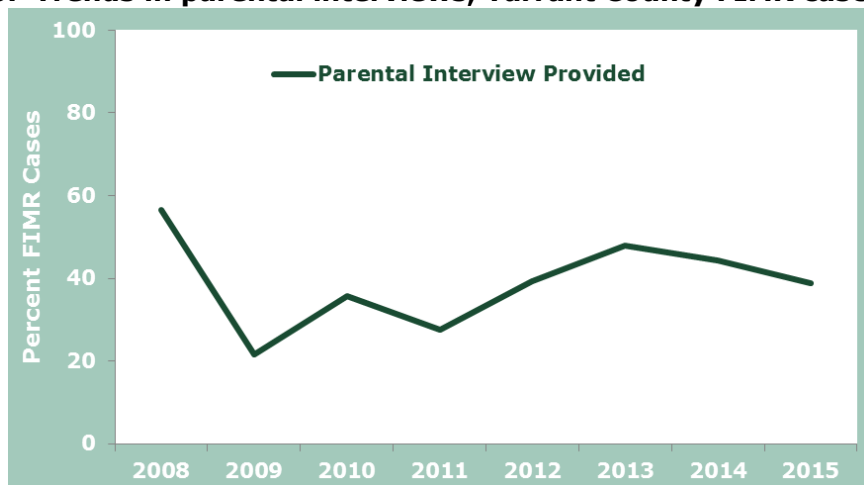
Figure 29. Parental interviews, Tarrant County FIMR cases, 2008-2015



Among all mothers ($n = 412$)
Data source: Tarrant County Public Health



Figure 30. Trends in parental interviews, Tarrant County FIMR cases, 2008-2015

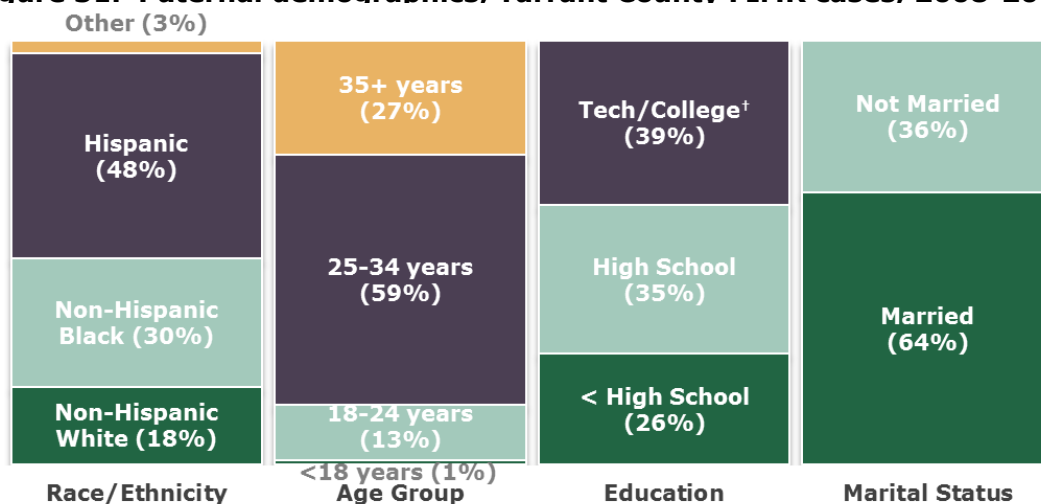


Among all mothers (n = 412)
Data source: Tarrant County Public Health

Another key benefit of conducting parental interviews is the ability to capture data on the father of the baby, which is often missing from birth certificates and medical records. However, even with the advantage of interviews, less than two thirds of mothers provided paternal information (65%). Therefore these data should not be compared to FIMR maternal demographics presented earlier in this report.

Forty-eight percent of FIMR fathers were Hispanic, 30% were non-Hispanic black, and 18% were non-Hispanic white (Figure 31). Paternal ages ranged from 17-54 years with an average age of 32 years. The majority of fathers were aged 25-34 years (59%). Twenty-six percent of fathers did not complete high school and 64% were married to the mother of their baby. Ninety-two percent of fathers were employed during the pregnancy with 64% of mothers reporting they were very satisfied with the father’s financial support at the time of the interview.

Figure 31. Paternal demographics, Tarrant County FIMR cases, 2008-2015

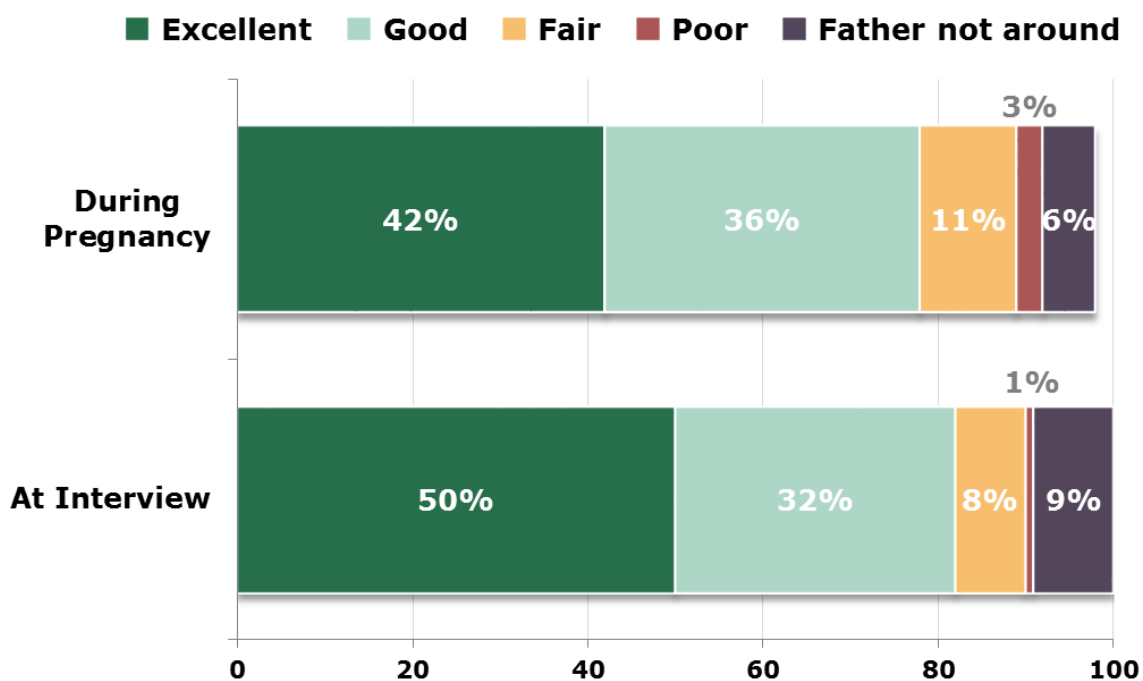


Among fathers who had data provided by mothers (n = 97)
Data source: Tarrant County Public Health



Mothers were asked to describe their relationship with the father of their baby both during the pregnancy and at the time of the interview (Figure 32). While those reporting an excellent relationship increased over time (42% vs. 50%), mothers reporting that the father was no longer around also increased (6% vs 9%).

Figure 32. Mother’s description of their relationship with the father of their baby, Tarrant County FIMR cases, 2008-2015



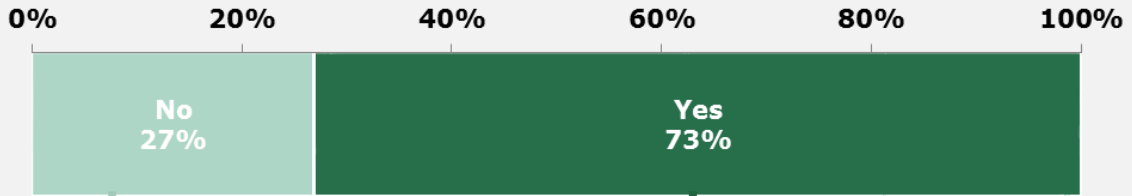
*Among mothers who provided information on fathers (n = 97)
Data source: Tarrant County Public Health*

The following section contains excerpts from the interviews of mothers who agreed to participate in that portion of the FIMR process. The FIMR CRT is grateful to these women for consenting to the difficult task of speaking about the loss of their children. Their courage and resolve affords an understanding of fetal/infant loss not attainable by any other means.

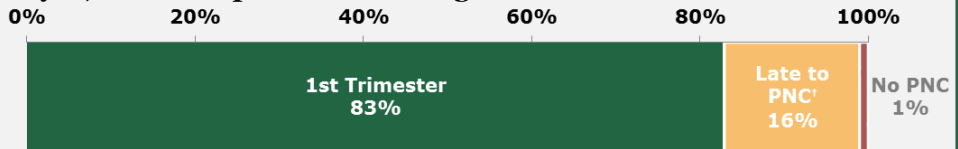


EXCERPTS FROM FIMR INTERVIEWS, TARRANT COUNTY, 2008-2015

Did you get prenatal care as early as you wanted?

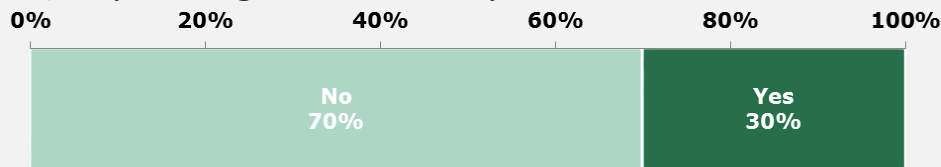


If yes, when did prenatal care begin?



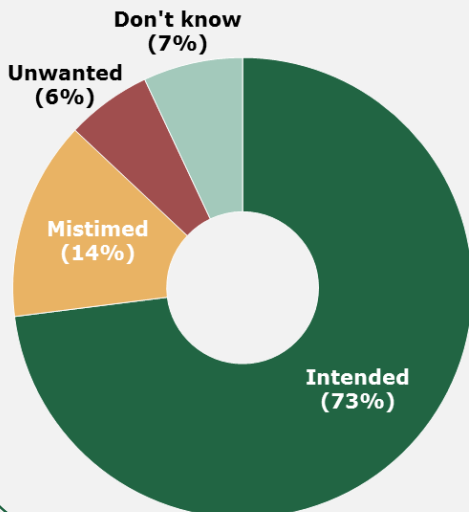
- I did not have enough money or insurance to pay for visits
- Delay in getting CHIP/Medicaid
- I could not get an appointment earlier in my pregnancy

If no, did you ever go to the ER when you needed care?



Among interviewed FIMR cases (n = 149); [†]Prenatal care began in 2nd or 3rd trimester
 Data source: Tarrant County Public Health

Pregnancy intention:



How do you remember feeling about becoming pregnant?

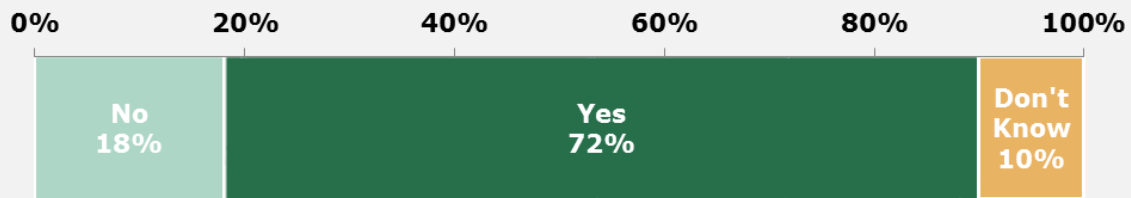
- I wanted to be pregnant then 60%
- I didn't want to be pregnant then/I wanted to be pregnant later 14%
- I wanted to be pregnant sooner 13%
- I don't know 7%
- I didn't want to be pregnant then or at any time in the future 6%

Among interviewed FIMR cases (n = 149)
 Data source: Tarrant County Public Health

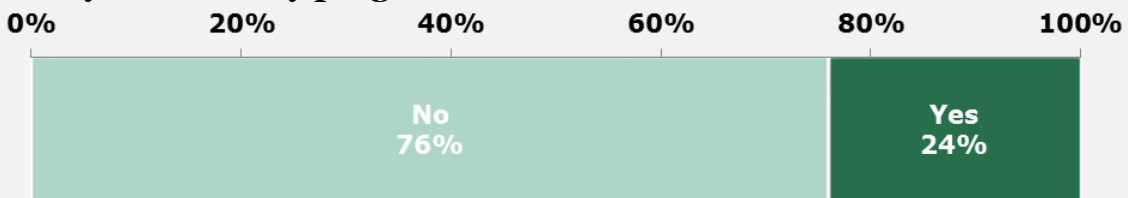


EXCERPTS FROM FIMR INTERVIEWS, TARRANT COUNTY, 2008-2015 (CONTINUED)

Do you expect to have more children?

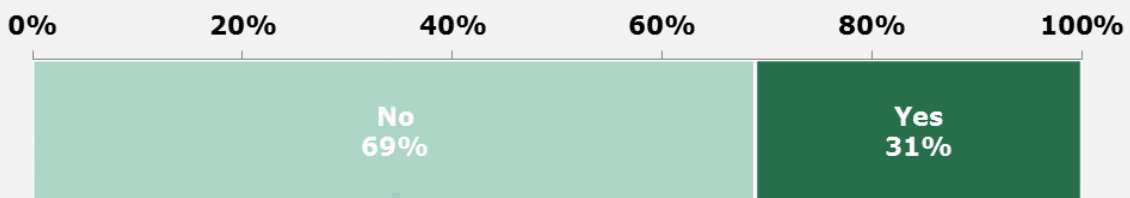


Are you currently pregnant?



*Among interviewed FIMR cases (n = 149)
Data source: Tarrant County Public Health*

Are you currently using birth control?



If no, why not?

- Currently pregnant (32%)
- Trying to get pregnant (30%)
- Had tubes tied (9%)
- Not sexually active (6%)
- Can't afford/too expensive (4%)
- Fertility issues (4%)
- Don't believe in it (2%)
- Don't want to use it (2%)

*Among interviewed FIMR cases (n = 149)
Data source: Tarrant County Public Health*



EXCERPTS FROM FIMR INTERVIEWS, TARRANT COUNTY, 2008-2015 (CONTINUED)

What would have made things better?

- Better medical care
- Checked by a health care provider sooner/more often during pregnancy
- Having the baby
- Better communication/explanation
- Nothing



"Spending more time with the doctor and having the doctor listen to me and answer my questions."

"I would have liked more information about caring for myself during pregnancy."

"Doctors were a bit pushy towards having an abortion, even after I declined."

"I wish I was more informed - I never anticipated the baby dying."

"Talking to someone about what I was going through, especially someone who had been through it."

"If I had been given more information about preterm labor and told when I needed to call the doctor for these signs."

"I just wish I could have done something to prevent what happened."

"Better sensitivity at postnatal appointments, I was asked questions about my baby as if he were living."

"I would have liked to have been in a more private room in the hospital so I couldn't hear other babies and moms."

Among interviewed FIMR cases (n = 149)
Data source: Tarrant County Public Health



EXCERPTS FROM FIMR INTERVIEWS, TARRANT COUNTY, 2008-2015 (CONTINUED)

What experiences were really helpful and supportive to you?

- Hospital staff
- Family
- Faith/Church
- Friends
- Memory items



"One nurse, who had a similar experience, was very helpful."

"Nurses at the hospital, both with their care for me and making sure the baby was remembered with a scrapbook, angel gown, and hand and foot casting."

"Staff preparing me to see the babies."

"Nurses, doctors, and chaplain were all very understanding."

"Compassionate nurses and doctors; excellent communication between providers and with me and my husband."

"Helping Hands from the NICU, photos of the baby, and the chaplain who did baby's baptism."

"Funeral home was very sensitive, gave a box for ashes."

*Among interviewed FIMR cases (n = 149)
Data source: Tarrant County Public Health*



What needs to be done to help those who experience the death of an infant?

- Chance to talk, express feelings, grieve
- Better communication or more information
- Better medical care
- Don't know
- Empathy from providers
- Privacy from other patients



"Women need someone to listen to them and tell them it is ok to talk about the child."

"A crash course to help prepare for emotional events and grief to come – like calls from sales people, insurance people, and congratulations comments from others."

"They should be given more information on support groups and should be given it sooner. I would have liked, early on, to have talked with someone who had been through a similar experience."

"Counseling for siblings who are old enough to understand death."

"A more comprehensive and detailed list of funeral homes should be provided - noting those that offer a reduced cost or free preparation or cremations. I had to call several and they were not always kind."

"There is a lack among many on how to respond to someone who has lost a baby. 'I'm sorry for your loss' goes a long way."

"Better communication between the hospital, chaplain, and parents. We left the hospital before the baby and would have stayed if we had known."

"My chart at the doctor's office did not note that my baby died so nurse asked me about the baby."

Among interviewed FIMR cases (n = 149)
Data source: Tarrant County Public Health



III. CASE REVIEW TEAM RECOMMENDATIONS

Based on the 440 fetal/infant deaths reviewed by the Tarrant County FIMR CRT, the following recommendations were put forth:

- support groups for parents who have experienced a fetal/infant loss
- standardize Risk Assessment tool for providers to use to assess prenatal risk
- interconception care targeted to those who have had a previous preterm birth (i.e. specialty comprehensive clinic for woman at high-risk for pre-term birth)
- a resource booklet for those who have experienced a fetal/infant loss (i.e. list of funeral homes, support groups, etc.)
- interventions to reduce late or no prenatal care among African American women

Previous CRT recommendations include:

- hold a workshop for hospital chaplains which provides guidance, tools, and training that focus on their role in counseling families who have lost an infant
- promote safe sleep in the community including infant sleeping position and risks of co-sleeping
- promote reproductive life plans, how they can prevent unplanned pregnancies, and help women and men improve their health and social situation so they are better prepared when and if they decide to have children
- promote the PRIDE initiative in the community which provides STD/HIV prevention education to teenagers and young adults aged 13-24 years in an effort to reduce sexually transmitted infections that disproportionately affect youth in Tarrant County
- promote the Texas Healthy Baby public awareness campaign ***Someday Starts Now*** which maintains that if there is a baby in ones future, regardless if it is months or years from now, the decisions you make today matter
- educate the community about the statewide Medicaid Managed Care Advisory Committee which serves as the central source for stakeholder input on the implementation and operation of Medicaid managed care
- the prevention of, proper screening for, and proper treatment of sexually transmitted diseases
- promote and increase preconception/interconception care to women within the context of the life course perspective with a focus on obesity and chronic disease abatement prior to planning a pregnancy
- promote access to and importance of health care through a medical home
- ***Kicks Count*** campaign promoting fetal movement monitoring by mothers throughout their pregnancy as well as instructing them on when and how to take action if needed



These recommendations have been communicated to the Tarrant County Infant Health Network, which serves as the FIMR Community Action Team (CAT). The Network is a community-based collaborative that works to reduce infant mortality by focusing on clinical and social services that support families before, during, and after pregnancy. The CAT will maintain its objective to increase awareness of the life course perspective and the importance of preconception health in reducing fetal/infant mortality as well as address the most current recommendations from the CRT. Community stakeholders have agreed to partner with the CAT in these targeted efforts.

The knowledge gained during the FIMR process and the resulting recommendations empower a community to enhance its health care and social service systems, influence policy, and drive planning efforts that will result in fewer losses and more healthy, thriving children and families. It is the hope of the Tarrant County FIMR that those in our community will take the information provided in this report and find areas for positive change within their own sphere of influence. The Tarrant County FIMR continues its endeavors to reduce fetal/infant mortality by reviewing deaths, analyzing data, communicating the results, and providing recommendations for improvement.



2008-2015 FIMR Quick Stats

- The FIMR CRT reviewed approximately 15% of the reported fetal/infant deaths that occurred in Tarrant County from 2008-2015 (440 out of 2,907). The percentage of reviewed cases ranged from 6% in 2008 to 24% in 2013.
- The majority of FIMR mothers (55%) began prenatal care in the first trimester.
- Medicaid was the most frequent source of medical funding among FIMR cases (52%).
- 69% of FIMR mothers had documentation of a prenatal risk assessment; of those assessed, 7% were classified very high risk and 34% were classified as high risk.
- The most prevalent maternal risk observed among FIMR cases was unhealthy weight status before pregnancy (68%): Underweight (2%), Overweight (27%), Obese (39%).
- The most common medical problem *predating* this pregnancy was sexually transmitted diseases (24% of FIMR mothers with a medical problem predating pregnancy).
- The most common medical problem *during* this pregnancy was urinary tract infection (17% of FIMR mothers with a medical problem during this pregnancy).
- 65% of FIMR cases were born very premature (gestational age of less than 32 weeks) and 67% of cases were born with a very low birth weight (less than 1,500 grams/3.3 pounds).
- Among all reviewed cases, over half exhibited no signs of life at birth, however the largest percentage were classified as early neonate deaths (those born alive and then dying within less than seven days (33%).
- The leading cause of death among all reviewed FIMR cases was intrauterine fetal demise of unknown cause (20%).
- 4% of FIMR cases were determined by the CRT to have a cost of care issue, 8% had an access to care issue, and 15% had a quality of care issue.
- A little over a third of FIMR families provided a personal interview (38%).
- Compared to those not interviewed, interviewed mothers were significantly more likely to begin their prenatal care in the first trimester (67% vs. 46%), to be married (59% vs. 33%), and to have private insurance (43% vs. 26%) (p<0.05).
- Among interviewed mothers, 73% reported starting prenatal care as early as they wanted, 72% expect to have more children, 69% were not currently using birth control, and 24% were pregnant again at the time of the interview.



**APPENDIX:
TARRANT COUNTY FIMR CASE REVIEW TEAM MEMBERS**

FIMR COORDINATOR (TARRANT COUNTY PUBLIC HEALTH)

Patti Shearin

FIMR CHART ABSTRACTORS (TARRANT COUNTY PUBLIC HEALTH)

Sandra Andrews Angela Marshall
Sandra Partridge Helen Clabaugh

FIMR FAMILY INTERVIEWER (TARRANT COUNTY PUBLIC HEALTH)

Nicole Shelton

FIMR CASE REVIEW TEAM MEMBERS

**ACCLAIM NURSE
MIDWIVES**

Tania Lopez

BAYLOR ALL SAINTS

Deanna Crowley
Becky Hardie
Alvina Peterson
Ella McCarroll

**CELEBRATE LIFE
MIDWIFERY SERVICES**

Jamie Hinton
Christy Martin

**COOK CHILDREN'S
HEALTH CARE SYSTEM**

Breanna Anderson
Britt Bachmann
Jayme Coffman
Susan Hillin
Yvette Johnson

**FORT WORTH
PERINATAL ASSOCIATES**

Tracy Papa

JPS HEALTH NETWORK

Amy Adair
Pat Alridge
Jeri Ames
Raquel Armstrong
Josephine Fowler
Misty Graham
G Stafford
Mitchell Swaim

HEALTHY START

Misty Wilder

MEDICAL CENTER

ARLINGTON

Candace Garland

**OBSTETRIX MEDICAL
GROUP**

April Bleich
Aiyanna Burton
Joseph Fitzwater

**TARRANT COUNTY
PUBLIC HEALTH**

Marisol Berrios
Isel Collazo
Catherine Colquitt
Michelle Cummings
Gary Kesling
Janelle Mattox

**TEXAS DEPARTMENT OF
STATE HEALTH SERVICES**

Patricia Rivera

**TEXAS HEALTH
RESOURCES**

Stephanie Eidson
Amanda Robbins

**UNT HEALTH SCIENCE
CENTER**

Shanna Combs
Jacqueline Garda

Note: Current Case Review Team members as of November 2017.





Tarrant County Public Health

Accountability. Quality. Innovation.



A healthier community through leadership in health strategy

1101 S. Main Street • Fort Worth, Texas 76104 • (817) 321-4700
<http://health.tarrantcounty.com>