

Ohio Fetal Mortality Brief, 2008-2017

Fetal death is the spontaneous intrauterine death of a fetus, also known as stillbirth. The fetus must be of 20 or more weeks gestation for the death to be reportable in Ohio. In 2017, 865 fetuses died in Ohio.

This brief provides findings from the Ohio Department of Health's (ODH's) investigation into fetal deaths using Vital Statistics records.

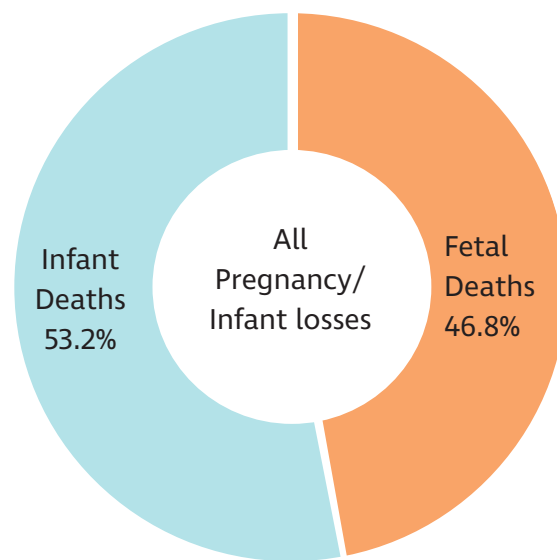
Key Findings

1. The number of fetal deaths is approximately the same as the number of infant deaths in Ohio.
2. Within 20 – 27 weeks of gestation, 52 percent of all reportable fetal deaths have occurred.
3. Overall fetal mortality rates have stayed the same over the past decade.
4. Pregnant black women are nearly two times as likely to experience a fetal death than pregnant white women.
5. Pre-pregnancy health is important in identifying women at risk of experiencing a fetal death.

The number of fetal deaths is approximately the same as the number of infant deaths in Ohio.

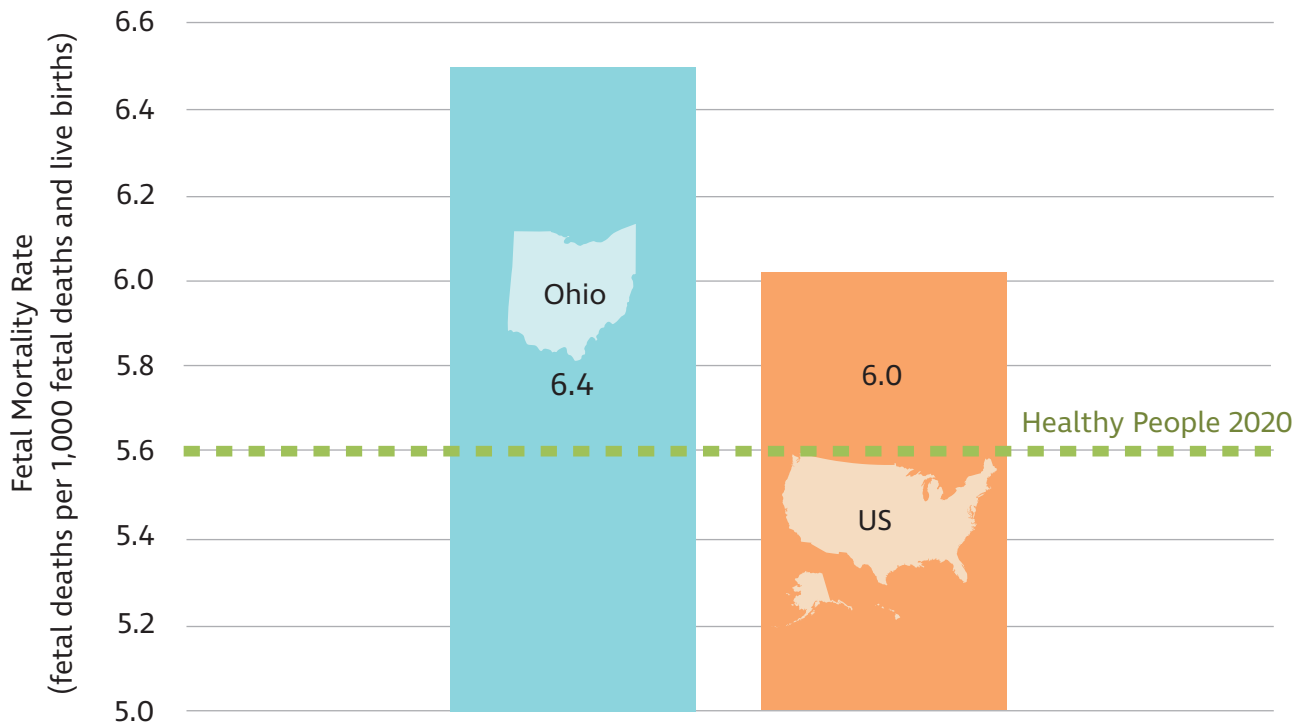
Fetal deaths represented 46.8 percent of all reportable pregnancy/infant losses in 2017 (Figure 2). In 2017, 865 Ohio fetuses died before being born. This is nearly the same number of infant deaths (982 live births who died during the first year of life) which occurred in 2017 (Figure 1).

Figure 1: Fetal and Infant Deaths, Ohio 2017



The fetal mortality rate (FMR) is defined as the number of fetuses who died at 20 weeks gestation or more per 1,000 fetal deaths and live births. Ohio's 2017 FMR is 6.3, which is higher than the Healthy People 2020 objective of 5.6. Ohio's 2016 fetal mortality rate of 6.5 is higher than the most recent available 2016 US rate of 6.0 (Figure 2).

Figure 2: Ohio's Fetal Mortality Rate vs US* and HP2020, 2016



* ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/fetaldeath/2016FetalUserGuide.pdf

Within 20 – 27 weeks of gestation, 52 percent of all fetal deaths have occurred.

Fetal deaths are categorized into three groups, defined by the gestational age at which they occur: intermediate (20-27 weeks), late (28-36 weeks), and term (greater than or equal to 37 weeks). Fetal deaths that occur during the early period (before 20 weeks gestation) are not required to be reported in Ohio.

The majority of fetal deaths in 2017 happened during the intermediate period (52 percent), with 31.2 percent occurring during the late period and 16.5 percent during term pregnancies (Figure 3).

Figure 3: Intermediate, Late, and Term Fetal Deaths, Ohio 2017

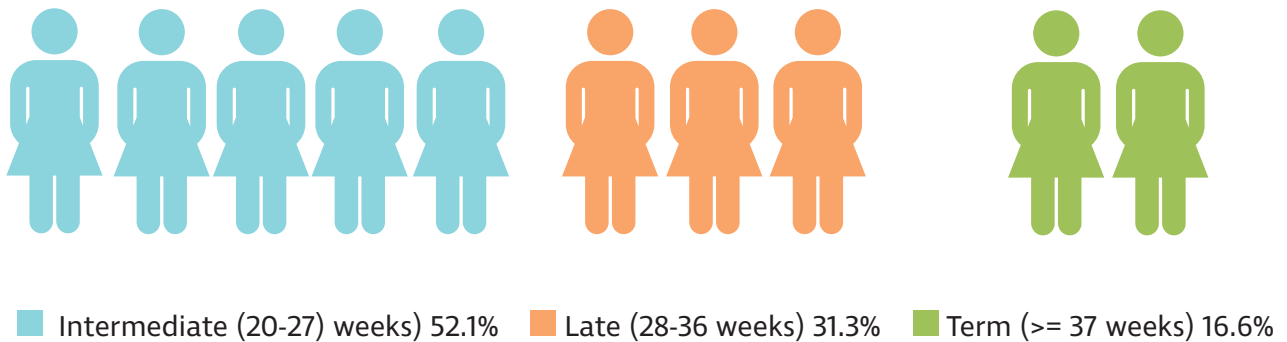


Figure 4: Fetal Mortality Rate (per 1,000 fetal deaths and live births) by Period, Ohio 2017



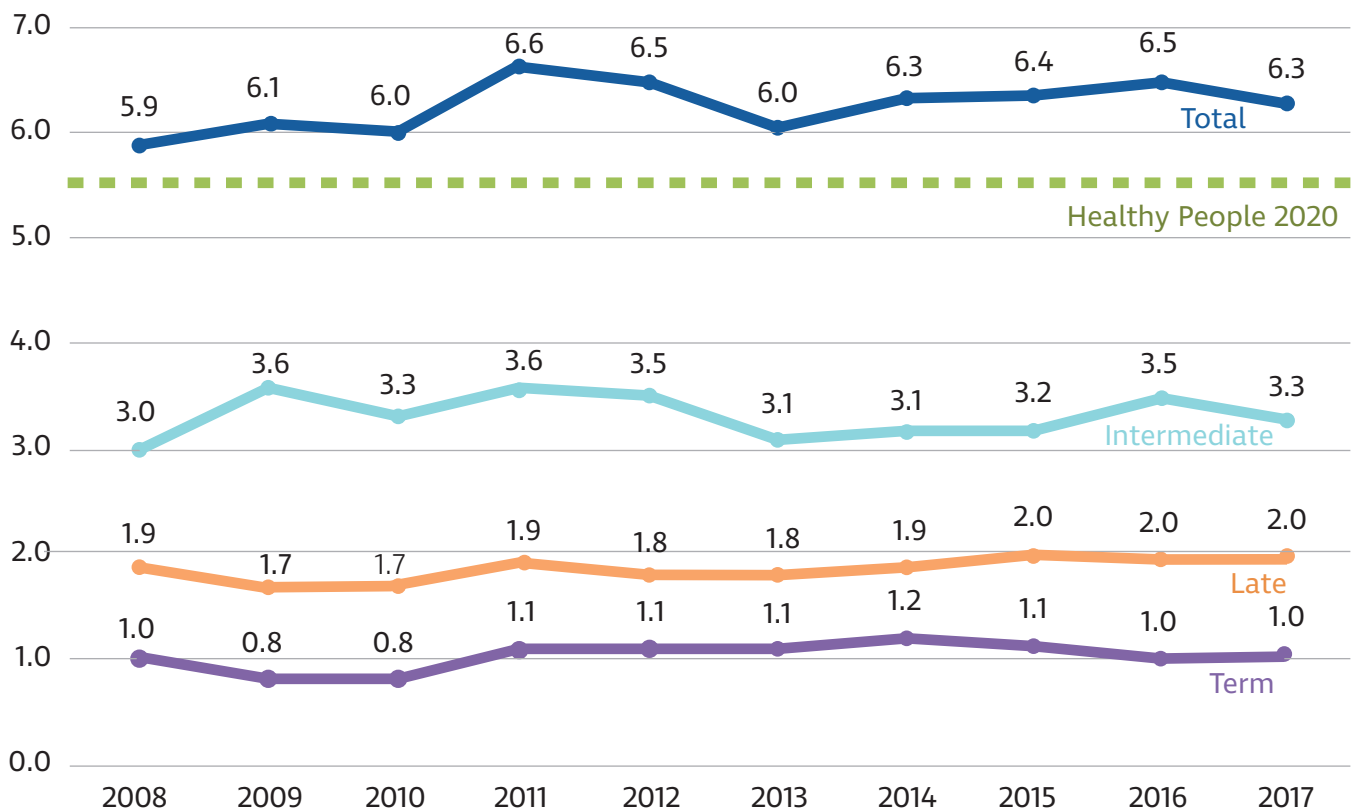
Fetal mortality rates for the intermediate period were approximately 50 percent higher than the late period and triple the rates at term (Figure 4).

Overall fetal mortality rates have stayed the same over the past decade.

Although Ohio's fetal mortality rate was minimally lower in 2017 compared to 2016, there has been no significant change in the overall rate over the past decade (Figure 5). The overall rate in 2008 was 5.9 and 6.3 in 2017. From 2008-2017, Ohio's rate was consistently higher than the national Healthy People 2020 target of 5.6.

Similarly, there has been no significant change in fetal mortality rates for the intermediate and term periods from 2008 to 2017.

Figure 5: Trends in Fetal Mortality Rates (per 1,000 fetal deaths and live births) by Period, Ohio 2008-2017

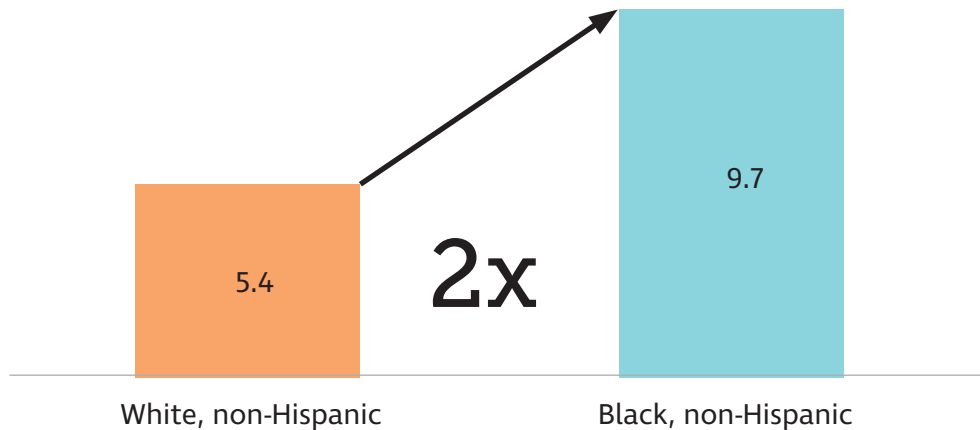


Joinpoint software models were used to test the statistical significance of changes in trends ($p < 0.05$). No change in trend was observed overall, or for Intermediate and term periods. Statistically significant annual percent increase of 1.47 was observed among fetal deaths occurring during the late period from 2008-2017.

Pregnant black women are nearly two times as likely to experience a fetal death than pregnant white women.

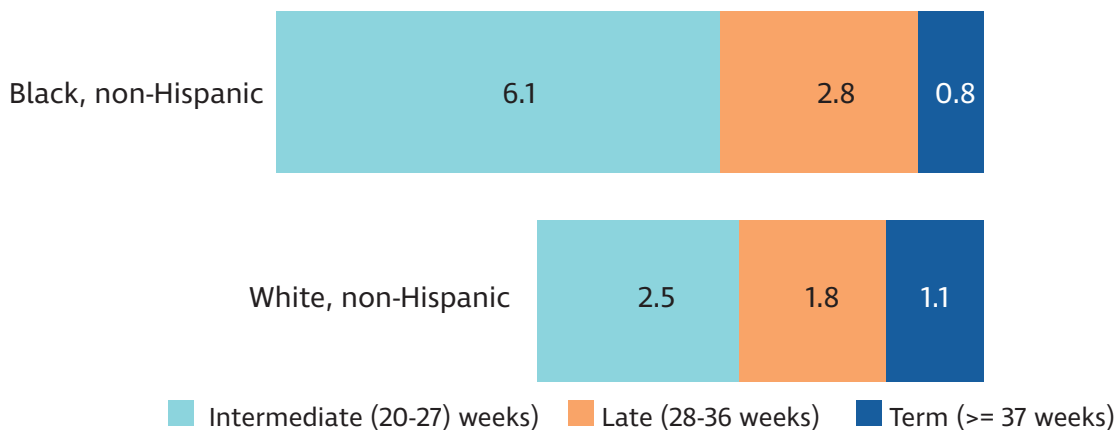
In Ohio, black women experience fetal deaths nearly twice as often as white women (Figure 6).

Figure 6: Fetal Mortality Rates (per 1,000 fetal deaths and live births) by Race, Ohio 2017



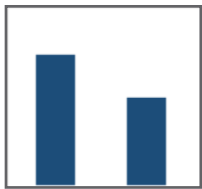
The disparity in fetal mortality rates are largely driven by more black women experiencing fetal deaths during the intermediate and late periods (Figure 7). The black fetal mortality rate during the intermediate period was 6.1 (per 1,000 fetal deaths and live births) and 2.8 in the late period. These rates are approximately double the white fetal mortality rates for the same periods (2.5 and 1.8, respectively). However, black and white women experience similar fetal mortality rates during the term period.

Figure 7: Intermediate, Late, and Term Fetal Mortality Rates (per 1,000 fetal deaths and live births) by Race, Ohio 2017



Pre-pregnancy health is important in identifying women at risk of experiencing a fetal death.

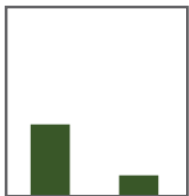
Women with health concerns prior to pregnancy had higher rates of fetal deaths. Optimizing health before pregnancy is important for all women (Figure 8).



Obese women experienced fetal mortality rates (7.4) over 50 percent higher than women with normal pre-pregnancy weights (4.9). The American College of Obstetricians and Gynecologists (ACOG) recommends women who are obese or overweight to lose weight before becoming pregnant. They suggest regular exercise and healthy eating to balance pre-pregnancy weight. Obstetricians may also refer obese and overweight women to a nutritionist for weight loss support.



In 2017, women with pre-pregnancy hypertension (12.1) experienced fetal deaths twice as often as women without pre-pregnancy hypertension (6.0). ACOG recommends women with pre-pregnancy hypertension visit a health care professional for monitoring and treatment prior to getting pregnant.

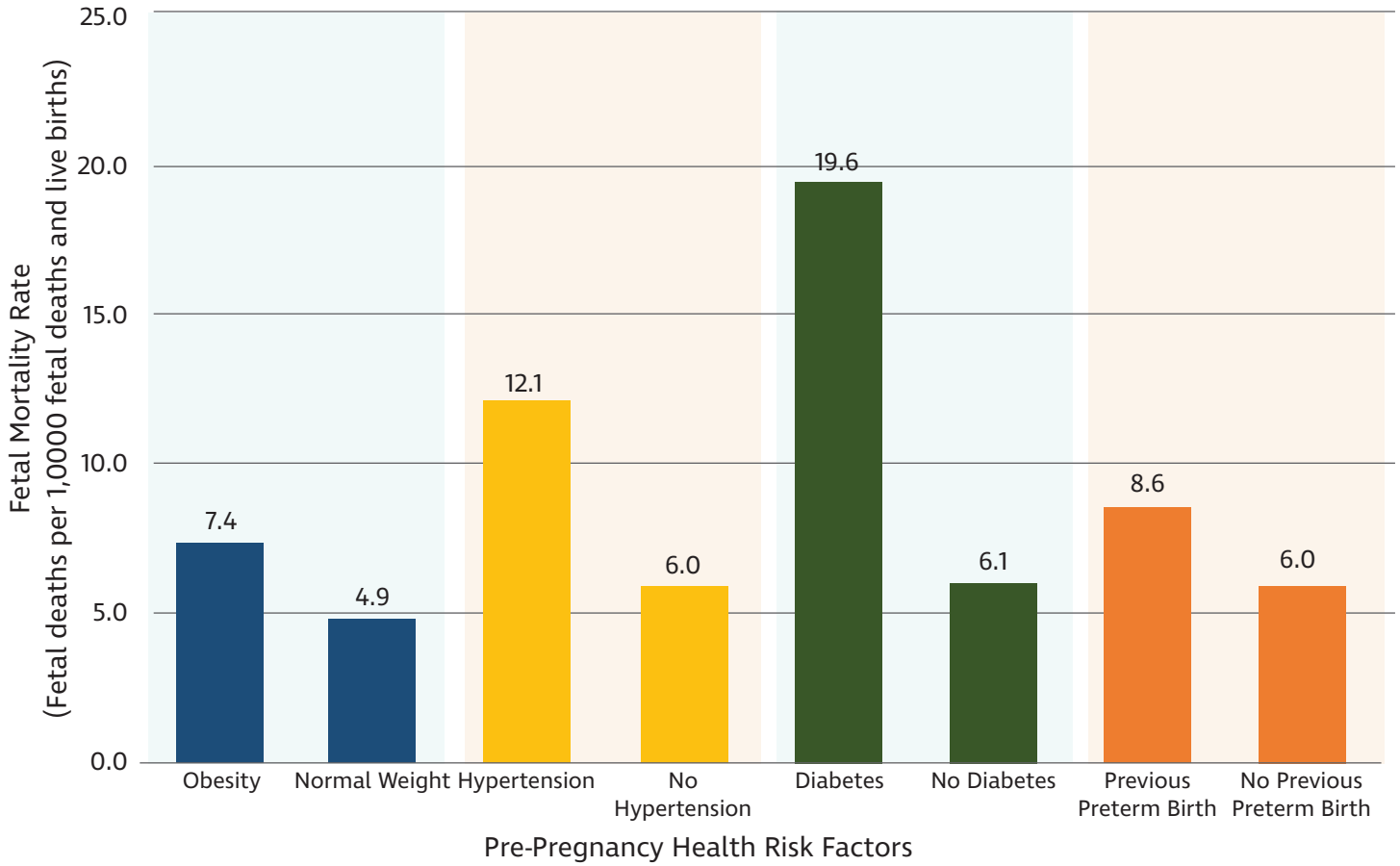


Among women with pre-pregnancy diabetes, the overall fetal mortality rate was 19.6 per 1,000 live births plus fetal deaths. This rate is three times higher than both those without pre-pregnancy diabetes (6.1) and the overall Ohio fetal mortality rate (6.3). According to the Centers for Disease Control and Prevention (CDC), it is important that women with diabetes receive care to manage and control their diabetes prior to pregnancy.



Women with a previous preterm birth (8.6) have a higher risk of experiencing a fetal death than women who have had a prior delivery that was not preterm (6.0). CDC recommends that women considering a pregnancy discuss previous pregnancy problems and experiences with a medical provider.

Figure 8: Fetal Mortality Rates by Pre-Pregnancy Health Risk Factors, Ohio 2017



Data Sources and Methods

This report contains data from the births and fetal death data sets, which are part of Ohio's Vital Statistics System. The births data set contains all live births reported from birth certificates. The fetal death data set includes death of all fetuses 20 weeks gestation or older. Only residents of Ohio are included in the birth and fetal death data sets. The fetal death data set is the primary data set for analyzing fetal mortality trends and patterns in Ohio and mirrors the system used nationally. It is also the primary source for examining race and Hispanic-origin fetal mortality and for examining factors related to the death. Race and Hispanic origin are self-reported by the mother/woman and are included in the birth and fetal death data sets.

Definitions

Fetal Death: Fetal death is defined as "death prior to the complete expulsion or extraction from its mother of a product of human conception ... which after such expulsion or extraction does not breathe or show any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles."

Fetal Mortality Rate: The number of fetal deaths in a specific year divided by the number of fetal deaths and live births within that same year, multiplied by 1,000.

Fetal Mortality Rate- Intermediate: The number of fetal deaths at 20-27 weeks gestation in a specific year divided by the number of fetal deaths at 20-27 weeks gestation and live births within that same year, multiplied by 1,000.

Fetal Mortality Rate- Late: The number of fetal deaths at 28-36 weeks gestation in a specific year divided by the number of fetal deaths at 28-36 weeks gestation and live births within that same year, multiplied by 1,000.

Fetal Mortality Rate- Term: The number of fetal deaths greater than or equal to 37 weeks gestation in a specific year divided by the number of fetal deaths greater than or equal to 37 weeks gestation and live births within that same year, multiplied by 1,000.

Infant Death: The death of a live-born baby before his or her first birthday.

Infant Mortality Rate: The number of infant deaths in a specific year divided by the number of live births within that same year, multiplied by 1,000.

Normal Weight: Refers to a woman's body mass index (BMI) between 18.5 kg/m² and 24.9 kg/m² before becoming pregnant.

Obese: Refers to a woman's body mass index (BMI) that was greater than 30 kg/m² before becoming pregnant.

Previous Preterm Birth: History of previous live births of less than 37 completed weeks of pregnancy.

Race: Infants and women identified as black and white race exclude those of Hispanic ethnicity.

References

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Graphics were produced by Elsie Stiger.

Suggested Citation

Ohio Department of Health. Ohio Fetal Deaths, 2017. Columbus, OH:
Ohio Department of Health. 2018.

Supplemental Data Tables

Table 1: Trends in Fetal Mortality Rate by Race, Ohio, 2008-2017

Year	Race: White, non-Hispanic			Race: Black, non-Hispanic			Total: All Races		
	Rate	Numerator	Denominator	Rate	Numerator	Denominator	Rate	Numerator	Denominator
2008	5.0	570	113,659	10.8	266	24,565	5.9	882	149,474
2009	5.3	583	110,106	10.2	245	24,066	6.1	883	145,452
2010	5.2	547	105,505	10.9	252	23,018	6.0	839	139,873
2011	5.5	571	103,249	10.7	245	22,890	6.6	922	138,946
2012	5.4	557	103,912	10.8	251	23,343	6.5	903	139,187
2013	5.0	513	102,748	10.0	238	23,827	6.0	843	139,878
2014	5.3	552	104,230	10.0	238	23,780	6.3	885	140,399
2015	5.2	542	103,689	10.9	261	23,874	6.4	892	140,204
2016	5.6	575	101,900	10.4	250	23,970	6.5	904	139,102
2017	5.4	543	100,392	9.7	236	24,242	6.3	865	137,760

Source: Ohio Department of Health, Ohio Vital Statistics Fetal Death and Live Birth files

Table 2: Trends in Fetal Mortality Rate by Period, Ohio, 2008-2017

Year	Intermediate (20-27 weeks)			Late (28-36 weeks)			Term (37 or more weeks)		
	Rate	Numerator	Denominator	Rate	Numerator	Denominator	Rate	Numerator	Denominator
2008	3.0	447	149,039	1.9	277	148,869	1.0	152	148,744
2009	3.6	522	145,091	1.7	241	144,810	0.8	118	144,687
2010	3.3	458	139,492	1.7	243	139,277	0.8	118	139,152
2011	3.6	492	138,516	1.9	269	138,293	1.1	147	138,171
2012	3.5	492	138,776	1.8	253	138,537	1.1	152	138,436
2013	3.1	430	139,465	1.8	253	139,288	1.1	157	139,192
2014	3.1	440	139,954	1.9	261	139,775	1.2	170	139,684
2015	3.2	445	139,757	2.0	281	139,593	1.1	156	139,468
2016	3.5	484	138,682	2.0	271	138,469	1.0	140	138,338
2017	3.3	450	137,345	2.0	270	137,165	1.0	143	137,038

Source: Ohio Department of Health, Ohio Vital Statistics Fetal Death and Live Birth files

Table 3: Fetal Mortality Rate by Select Demographics and Health Characteristics of Mother, Ohio, 2017

Domain	Attribute	Rate	All Fetal Deaths	Fetal Deaths and Live Births
			Numerator	Denominator
Demographic: Age (years)	<18	14.7	29	1,975
	18-19	4.0	24	5,950
	20-24	5.4	166	30,692
	25-29	5.4	229	42,536
	30-34	5.9	222	37,568
	35-39	2.1	34	15,936
	40 or more	16.7	50	2,992
Demographic: Education	Less than high school diploma	6.9	126	18,207
	High school diploma or GED	7.2	270	37,587
	Some college or Associates Degree	6.5	258	39,694
	Bachelors Degree	4.7	122	26,147
	Graduate Degree	4.3	67	15,710
Demographic: County of Residence at Death	OEI County	7.1	525	73,732
	Urban	11.5	541	47,057
	Suburban	4.8	101	20,829
	Rural, not Appalachia	5.2	92	17,702
	Appalachia	5.9	130	22,166
Demographic: WIC Enrollment	WIC enrolled	4.2	196	46,153
	Not enrolled in WIC	7.0	634	90,766
Demographic: Race	White, non-Hispanic	5.4	543	100,392
	Black, non-Hispanic	9.7	236	24,242
Demographic: Ethnicity	Hispanic	5.6	42	7,515
	Non-Hispanic**	6.3	823	130,245
Health: Hypertention or Eclampsia	Pre-Pregnancy Hypertension	12.1	53	4,373
	Gestational Hypertension	4.7	56	11,812
	Eclampsia*	-	-	-
Health: Diabetes or Gestational Diabetes	Pre-Pregnancy Diabetes	19.6	29	1479
	Gestational Diabetes	3.1	33	10,584
Total		6.3	865	137,760

Source: Ohio Department of Health, Ohio Vital Statistics Fetal Death and Live Birth files

* Figure does not meet standards of reliability or precision, based on fewer than ten deaths in the numerator

**Non-Hispanic deaths include those of unknown or missing ethnicity.

Table 4: Fetal Mortality Rate by Race and Select Demographics and Health Characteristics of Mother, Ohio, 2017

Domain	Attribute	Race: White, non-Hispanic			Race: Black, non-Hispanic		
			All Fetal Deaths	Fetal Deaths and Live Births		All Fetal Deaths	Fetal Deaths and Live Births
		Rate	Numerator	Denominator	Rate	Numerator	Denominator
Demographic: Age (years)							
	<18	9.2	10	1,089	21.5	14	650
	18-19	3.2	12	3,756	6.7	11	1,634
	20-24	4.5	94	20,681	7.6	55	7,258
	25-29	4.6	144	31,418	8.8	64	7,313
	30-34	5.1	149	29,270	10.7	50	4,671
	35-39*	2.1	25	11,980	-	-	-
	40 or more	15.6	33	2,122	24.5	12	490
Demographic: Education							
	Less than high school diploma	5.8	61	10,582	9.8	45	4,570
	High school diploma or GED	6.5	165	25,355	9.1	82	8,990
	Some college or Associates Degree	5.4	156	29,116	10.9	86	7,895
	Bachelors Degree	4.4	97	22,252	9.4	17	1812
	Graduate Degree*	4.0	52	12,964			
Demographic: County of Residence at Death							
	OEI County	5.7	246	43,340	10.3	219	21,325
	Urban	5.6	260	46,194	10.1	217	21,394
	Surburban*	4.9	88	18,112	-	-	-
	Rural, not Appalachia*	5.0	80	16,154	-	-	-
	Appalachia*	5.7	114	19,929	-	-	-
Demographic: WIC Enrollment							
	WIC Enrolled	3.8	102	27,160	5.5	74	13,359
	Not enrolled in WIC	5.8	419	72,757	14.4	154	10,681
Health: Hypertention or Eclampsia							
	Pre-Pregnancy Hypertension	11.1	31	2,804	14.5	19	1,311
	Gestational Hypertension	3.5	30	8,620	8.0	19	2,372
	Eclampsia*	-	-	-	-	-	-
Health: Diabetes or Gestational Diabetes							
	Pre-Pregnancy Diabetes*	22.2	21	946	-	-	-
	Gestational Diabetes	2.5	19	7,505		10	1,567
Total							
		5.4	543	100,392	9.7	236	24,242

Source: Ohio Department of Health, Ohio Vital Statistics Fetal Death and Live Birth files

* Figure does not meet standards of reliability or precision, based on fewer than 10 deaths in the numerator