Kansas Infant Mortality and Stillbirth Report, 2021

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Executive Summary

Infant mortality is an important indicator of community health. It is associated with a variety of factors such as economic development, general living conditions, social well-being, basic needs, illnesses such as diabetes and hypertension, and quality of the environment. This report provides a long-term assessment of progress on infant mortality.

Key findings include:

- The infant mortality rate for 2021 was a little below the US infant mortality rate unlike in 2020. The infant rate has declined significantly from 2002 to 2021(p-value <.001).
- The 2021 infant mortality rate (5.3 deaths per 1,000 live births) is only slightly higher than the Healthy People 2030 objective of no more than 5.0 deaths per 1,000 live births. The rate among non-Hispanic White births (4.5) was below the objective and the rate among Hispanic births (5.2) is close to the objective, while non-Hispanic Black births (13.6) are well above.
- From 2002 to 2021, the trend for infant mortality rate decreased among non-Hispanic White births (p-value=.02) and non-Hispanic Black births(p-value<.0001). No statistically significant (p-value: .28) trend in infant mortality was seen among Hispanic births.
- The infant mortality rate among non-Hispanic Black births remained at least 2.5 to 3 times that of non-Hispanic White births for most years from 2002 to 2021. The non-Hispanic Black births had a rate three times higher than the non-Hispanic White population in 2021. This shows the difference between the non-Hispanic Black births and the non-Hispanic White births is shrinking.
- The rate of preterm-related mortality significant declined from 2002 to 2021(p-value<.0001). Between 2017 and 2021, there were 166.5 preterm-related mortality rate per every 100,000 live births. The rate among non-Hispanic Black births was higher than that among non-Hispanic White births or Hispanic births.
- The leading cause of stillbirths with more than 1 in 3 stillbirths (31.3%) in 2017-2021 were attributed to an unspecified cause of death. The second leading cause of fetal death was complications of the placenta, umbilical cord, and membranes (22.5%).
- Perinatal deaths include stillbirths with a gestation period of at least 28 weeks, and hebdomadal deaths (less than seven days post birth). The perinatal mortality rate declined from 2002 to 2021. In 2021, the perinatal mortality rate was 5.8 stillbirths at 28 weeks or more of gestation plus infant deaths occurring under 7 days per 1,000 live births.

Introduction

An important indicator of the health of a community is infant mortality, the death of an infant before reaching one year of age. Infant deaths can stem from environmental, socioeconomic, biological, and lifestyle factors, which are often interconnected. [1] Many of these factors are associated with the health status of the whole population, such as general living conditions, social wellbeing, basic needs, chronic health conditions, and quality of the environment. [2,3]

Known risk factors for infant morbidity and mortality include:

- Black, American Indian/Alaskan Native, Native Hawaiian, or other Pacific Islanders background [3, 5]
- Family history of birth defects or genetic disorders [4]
- Use of alcohol, nicotine products, other substances, or certain medications during pregnancy
- Advanced maternal age [4, 5]
- Teen pregnancy [5]
- Pre-pregnancy underweight status or obesity [4, 5]
- Chronic health conditions, such as diabetes mellitus or hypertension [4, 5, 7]
- Short interval (less than 18 months) between pregnancies [6]
- Infections during pregnancy [4, 7]
- Infant exposure to secondhand smoke [8]
- Certain infant sleep habits (increase the risk for sleep-related deaths) [8, 9]
    - Sleeping on the side or stomach, rather than on the back
    - Sleeping on a soft surface, such as an adult mattress or couch
    - Sleeping with loose bedding, toys, or other clutter
    - Sharing a bed with another person
- Lack of access to quality health care [9, 10]
- Maternal mental conditions [7, 10]
- High levels of stress around the time of pregnancy [11]

To help promote infant health and well-being, cross-sector collaboration is needed. Strategies include:

- Reduce systemic barriers which contribute to racial disparities in birth outcomes.
- Increase access to timely health care services, including routine prenatal and postpartum visits, as well as dental healthcare, mental healthcare, family planning visits, and prenatal educations classes. [9], [10]
- Support and refer to services for tobacco cessation. [12], [13]
- Support families in following infant safe sleep recommendations from the American Academy of Pediatrics. [8], [9]
- Encourage folic acid supplement, before, during and between pregnancies. [4]
- Support families in achieving breastfeeding recommendations, which include breastfeeding infants exclusively for at least six months. [8], [14], [15]
- Complete comprehensive screenings during healthcare visits. [7], [10] Provide brief interventions and referral to care as needed.
- Avoid early delivery before 39 weeks of gestation, unless medically indicated. [10]
- Assess clients' access to basic needs during healthcare visits, such as transportation, food, and shelter. [10], [16] Make referrals and connections to services.

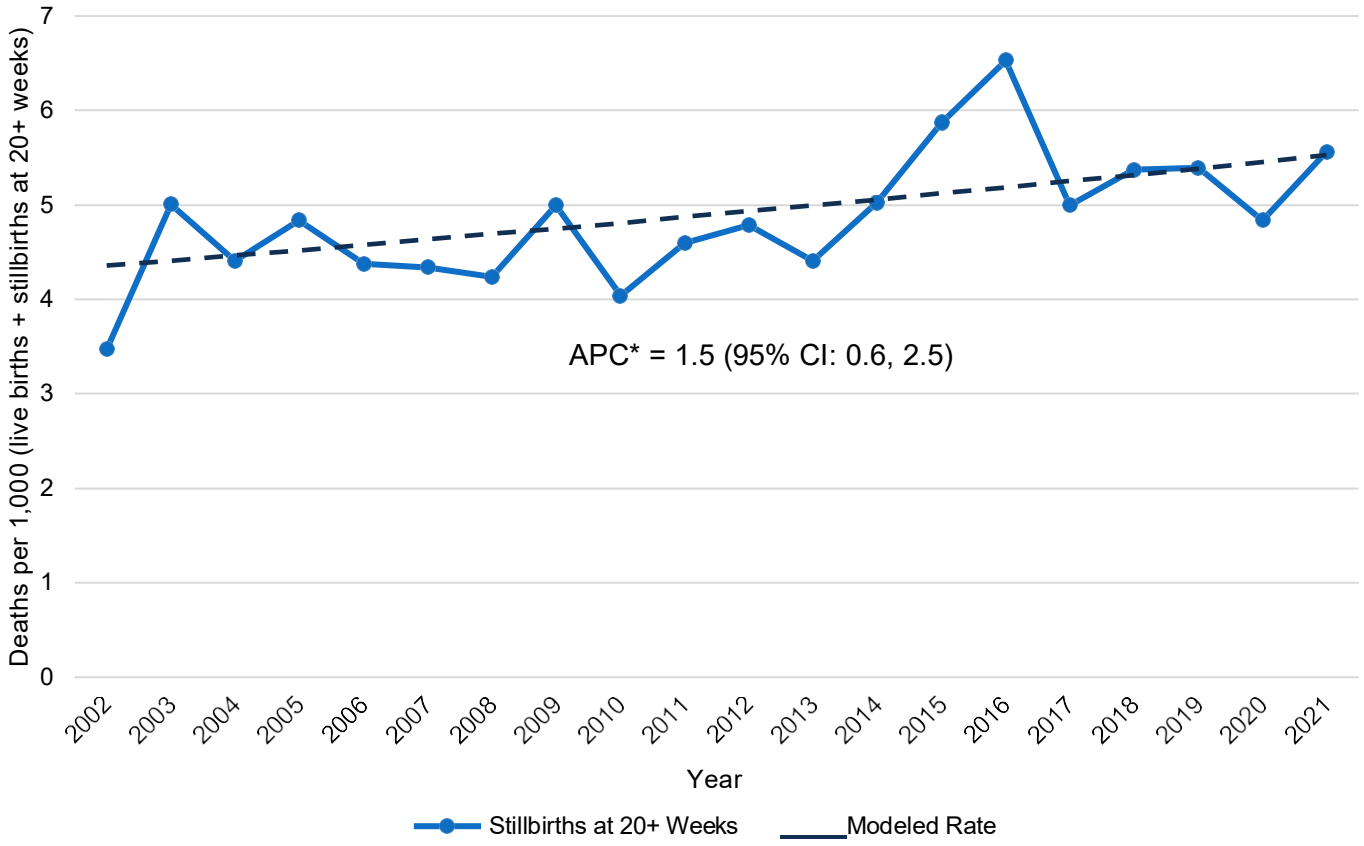
Healthy People 2030 provides national objectives for improving the health of all Americans, including infant mortality. The Healthy people 2030 target is no more than 5.0 deaths, per 1,000 live births. [16] In 2021, the Kansas rate was 5.3 while the nationwide infant mortality rate was 5.4 per 1,000 live births. [3]

The Kansas Department of Health and Environment (KDHE) Bureau of Epidemiology and Public Health Informatics (BEPHI) monitors infant mortality and supports programs that promote access to health services for mothers and infants. This report builds on information in the *KDHE Annual Summary of vital Statistics, 2021* [18] with multi-year statistics and emphasis on trends, geographic distribution, and potential risk factors. Information on stillbirths is also presented, since stillbirths and infant deaths may share similar risk factors.

Fetal & Perinatal Mortality

A stillbirth is the death or loss of a baby before or during delivery, described as the loss of a baby at or after 20 weeks of pregnancy. [31] The Kansan stillbirth rate experienced a significant increase (p-value =.003) from 2002 to 2021 (Figure A, Table 2) at an estimated annual percent change of 1.5% (95% CI: 0.6%, 2.5%). The increase after 2013, particularly, may be partially due to a change in fetal death reporting requirements in Kansas, which occurred in July 2014. While counts in this report are based on the 2014 definition, counts may still be lower for prior years due to the methodology change (see Technical Notes). [19] Although there has been a significant increase in the annual percent change in stillbirths, there was a drop of stillbirth rate from 2019 (5.4 per 1,000 live births) to 2020 (4.8 per 1,000 live births) but the rate increases in 2021 to 5.6 per 1,000 live births (95% CI: 4.8, 6.4).

Figure A. Stillbirth Rates, Kansas, 2002-2021

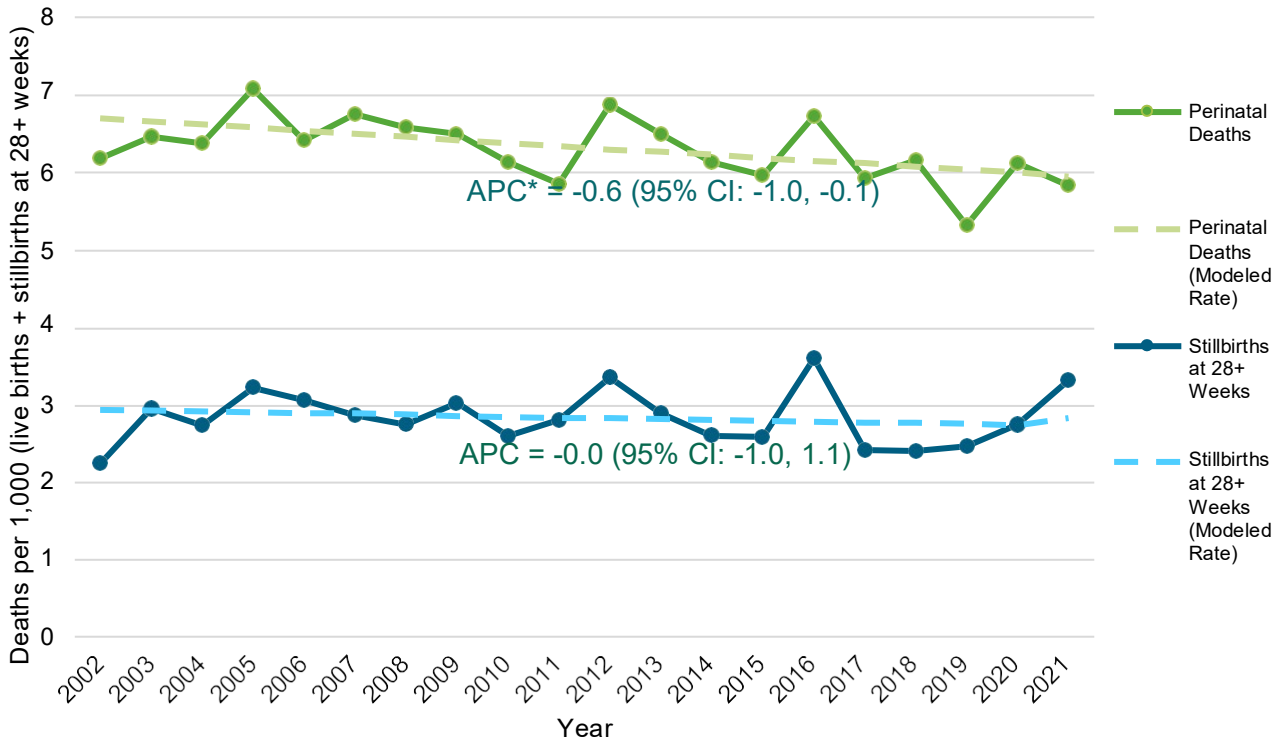


APC = Annual Percent Change
* Trend is statistically significant (p-value < 0.05).
Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

Among stillbirths at 20 weeks or more of gestation that occurred in 2017-2021, 31.3% were attributed to unspecified cause (Table 7). The second leading cause of fetal death was complications of the placenta, cord, and membranes (22.5%), followed by maternal conditions that may be unrelated to present pregnancy (12.6%). The rate of stillbirths occurring at 28 weeks or more of gestation (Table 2, Figure B) did not change significantly (p-value: .96) over the twenty-year period.

Perinatal deaths include stillbirths at 28 weeks or more of gestation, as well as deaths to infants under 1 week old. Despite the increase in the number of stillbirths reported, the rate of perinatal deaths dropped significantly (p-value: .02) from 2002 to 2021. In 2021, the perinatal mortality rate was 5.9 (95% CI: 4.6,7.2) per 1,000 live births. The stillbirths at 28 weeks or more of gestation was 3.32 (95% CI: 2.7, 4.0) per 1,000 lives in the same year.

Figure B. Perinatal Mortality Rates and Stillbirth Rates at 28+ Weeks of Gestation, Kansas, 2002-2021



APC = Annual Percent Change
* Trend is statistically significant (p-value < 0.05).
Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

The stillbirth rate varied by race and ethnicity. During 2017-2021, there were 114 stillbirths to non-Hispanic Black mothers (Table A), corresponding to a rate of 9.5 stillbirths at 20 weeks or more of gestation, per 1,000 live births plus stillbirths at 20 weeks or more of gestation (95% CI: 7.7, 11.2). This was more than twice the rate among the non-Hispanic White population (4.4; 95% CI: 4.0, 4.7). Among the Hispanic population, there were 7.0 stillbirths at 20 weeks or more of gestation, per 1,000 live births plus stillbirths at 20 weeks or more of gestation (95% CI: 6.1, 8.0). More than one-third of Hispanic stillbirths were attributed to unspecified cause (Table A). Like previous time-intervals unspecified cause was also the leading factor for the non-Hispanic White and non-Hispanic Black populations.

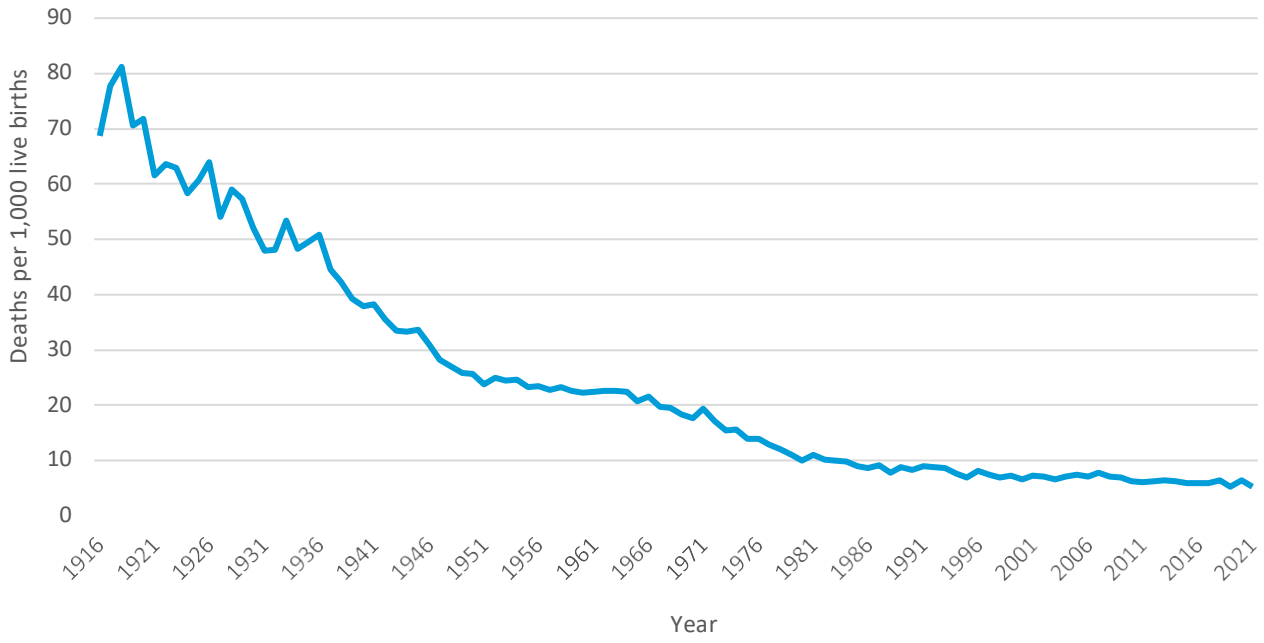
Table A. Stillbirths among the Non-Hispanic White, Non-Hispanic Black, and Hispanic Populations, by Leading Causes of Fetal Death, Kansas, 2017-2021

Cause of Fetal Death (ICD-10 Code) by Population Group	Number of Stillbirths	Percent of Stillbirths
Non-Hispanic White (n=533)		
1. Fetal death of unspecified cause (P95)	145	27.20
2. Fetus affected by complications of placenta, cord and membranes (P02)	134	25.14
3. Fetus affected by maternal conditions that may be unrelated to present pregnancy (P00)	77	14.45
Non-Hispanic Black (n=114)		
1. Fetal death of unspecified cause (P95)	31	27.19
2. Fetus affected by complications of placenta, cord and membranes (P02)	20	17.54
3. Fetus affected by maternal complications of pregnancy (P01)	20	17.54
Hispanic, any race (n=211)		
1. Fetal death of unspecified cause (P95)	92	43.60
2. Fetus affected by complications of placenta, cord and membranes (P02)	33	15.64
3. Fetus affected by maternal conditions that may be unrelated to present pregnancy (P00)	10	4.74

Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

Infant Mortality

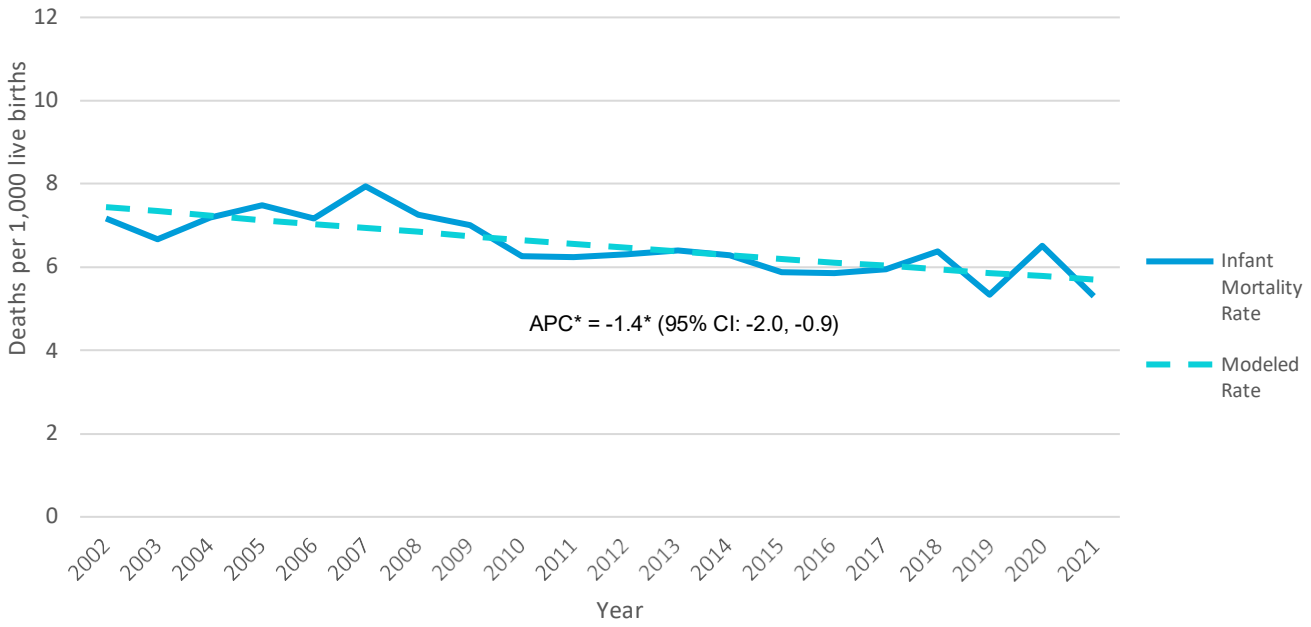
Figure C. Infant Mortality Rates, Kansas, 1916-2021



Source: Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

The rate of infant deaths has dropped dramatically from the early to late 1900s (Figure C). From 2002 to 2021, infant mortality declined significantly (p-value < .001) at an annual percent change (APC: -1.4%). In 2021, 184 infant deaths were reported (Table 1), corresponding to an infant mortality rate of 5.3 (Table 2) deaths per 1,000 live births (95% CI: 4.5, 6.1).

Figure D. Infant Mortality Rates, Kansas, 2002-2021



APC = Annual Percent Change
* Trend is statistically significant (p-value < 0.05).
Source: Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

Most Kansas infant deaths were neonatal deaths, occurring before the infant reached 28 days of age. In 2021, there were 106 neonatal deaths (57.6% of infant deaths, or 3.1 deaths per 1,000 live births; 95% CI: 2.5, 3.6) and 78 post neonatal deaths (42.4% of infant deaths, or 2.2 deaths per 1,000 live births; 95% CI: 1.8, 2.8) (Tables 1 and 2). From 2002 to 2021 (Figure E), the rate of neonatal deaths declined significantly (p-value: .001), with (APC) of 1.3%. Post neonatal mortality rose at a non-significant rate (p-value: .062) from 2002 to 2007, and then declined significantly (p-value: .002) from 2007 to 2015, with an APC of 6% and finally rose at a non-significant rate (p-value: .002) from 2015-2021, with an APC of 4%.

Figure E. Infant Mortality Rates, by Infant's Age, Kansas, 2002-2021

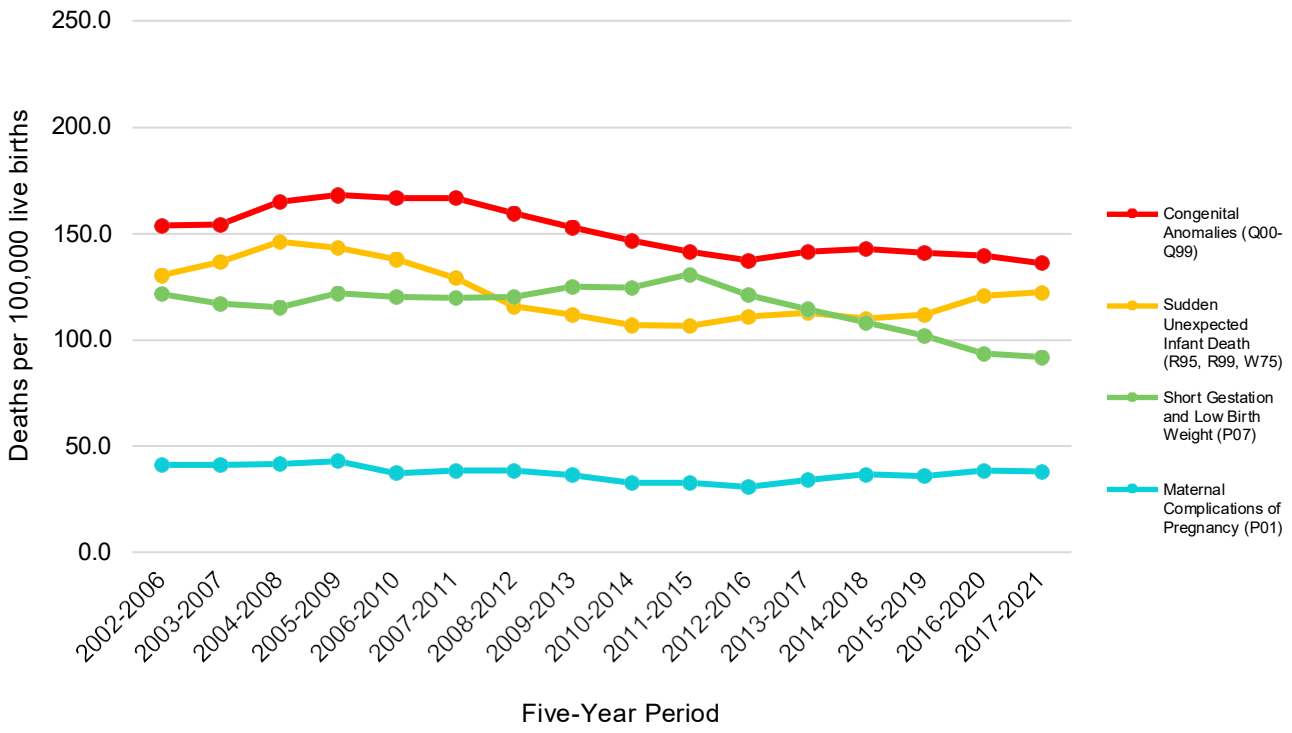
APC = Annual Percent Change
* Trend is statistically significant (p-value < 0.05).
Source: Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

Leading Causes of Infant Mortality

Twenty-year trends in the four leading causes of infant death are shown in Figure F. The four leading causes include:[1,20]

- Congenital anomalies (ICD-10 codes Q00-Q99), also known as birth defects
- Sudden Unexpected Infant Deaths or SUIDs (ICD-10 codes R95, R99, and W75)
- Short gestation and low birth weight (ICD-10 code P07)
- Maternal complications of pregnancy (ICD-10 code P01)

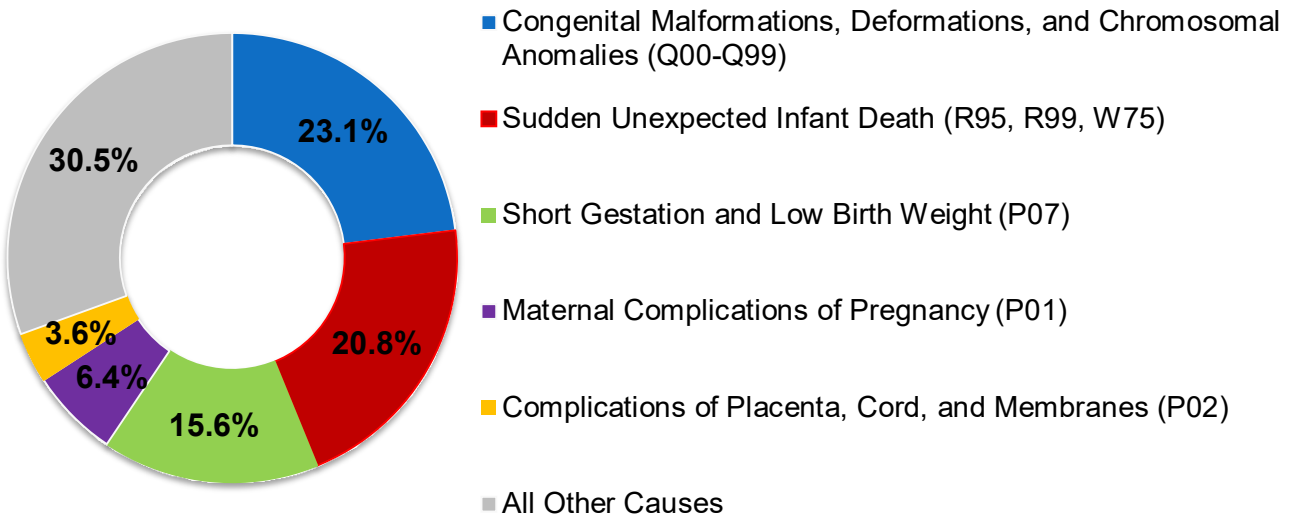
Figure F. Five Year Rolling Averages Infant Mortality Rates by Four Leading Causes of Infant Death, Kansas, 2002-2021



Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

The leading cause of infant death for each rolling five-year period from 2002-2021 was congenital anomalies with a corresponding rate of 136.0 infant deaths per 100,000 live births (95% CI: 118.8, 153.2) (Figure F, Table B). In 2017-2021, nearly 1 in 4 infant deaths (23.1%) were due to congenital anomalies (Figure F, Table B).

Figure G. Leading Causes of Infant Mortality, Kansas, 2016-2020



Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

The second leading cause of infant death during 2017-2021 was Sudden Unexpected Infant Death. 20.8% of infant deaths were SUIDs, with a corresponding rate of 122.5 infant deaths per 100,000 live births (95% CI: 106.2, 138.8). SUID was the leading cause of death in infants who had reached at least 28 days of age (52.1%, 186 /357: infant death at least 28 days/ total cause of those deaths) (Table 5).

The third leading cause of infant death during 2017-2021 was short gestation and low birth weight (15.6% of infant deaths). The fourth leading cause of infant's death was maternal complications of pregnancy (6.4%). Other leading causes of infant deaths in 2017-2021 are shown in Table B.

Table B. Infant Deaths by Ten Leading Causes of Infant Death, Kansas, 2017-2021

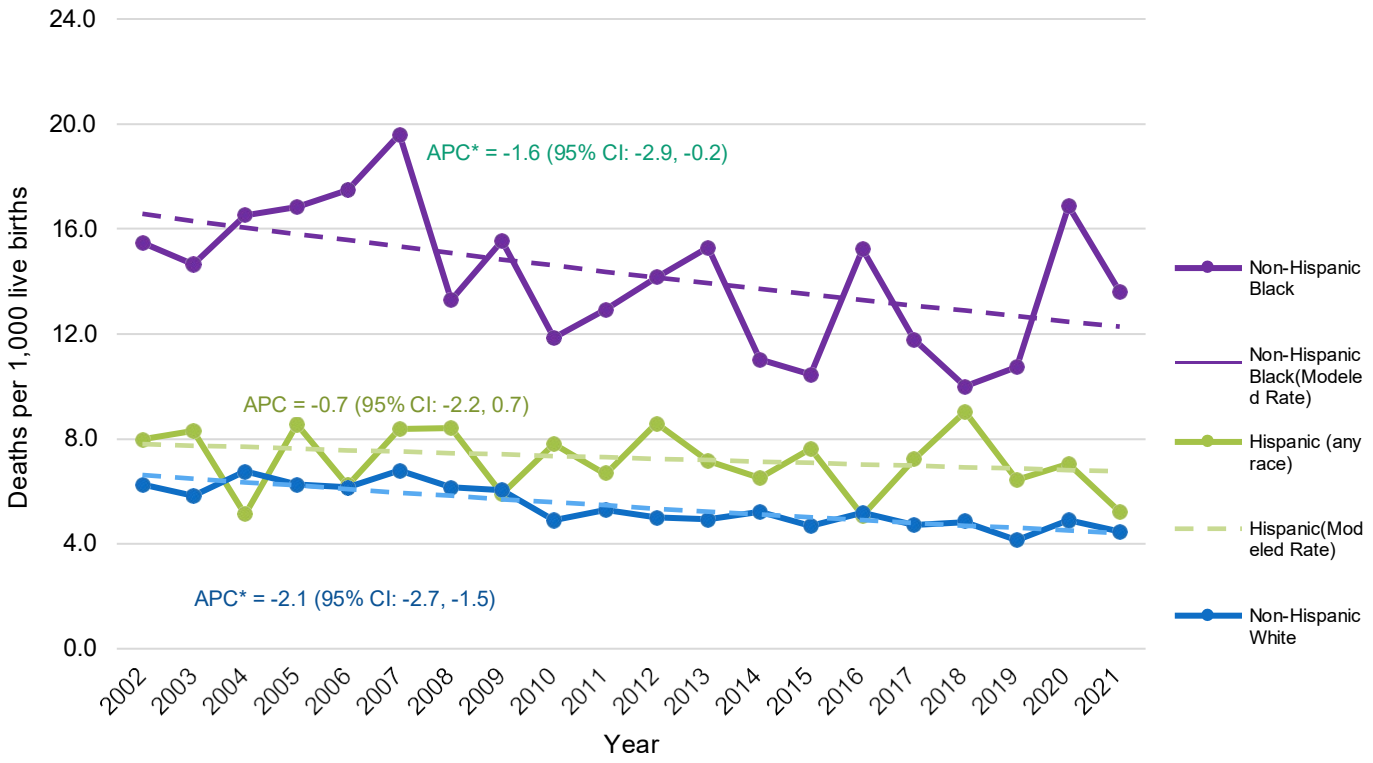
Causes of Death (ICD-10 Code)	Number of Deaths	Percent of Deaths	Rate (95% Confidence Interval)
All Causes	1045	100.0	589.8 (553.9, 625.6)
1. Congenital Malformations, Deformations, and Chromosomal Anomalies (Q00-Q99)	241	23.1	136.0 (118.8, 153.2)
2. Sudden Unexpected Infant Death (R95, R99, W75)	217	20.8	122.5 (106.2, 138.8)
3. Disorders Related to Short Gestation and Low Birth Weight, Not Elsewhere Classified (P07)	163	15.6	92.0 (77.9, 106.1)
4. Newborn Affected by Complications of Pregnancy (P01)	67	6.4	37.8 (29.3, 48.2)
5. Newborn Affected by Complications of Placenta, Cord, and Membranes(P02)	38	3.6	21.4 (15.2, 29.4)
6. Accidents (Unintentional Injury) (V01-X59, excluding W75)	21	2.0	11.9 (7.3, 18.1)
7. Bacterial Sepsis of Newborn(P36)	14	1.3	7.9 (4.3, 13.3)
8. Neonatal Hemorrhage (P50-P52, P54)	12	1.1	6.8 (3.5, 11.8)
9. Intrauterine Hypoxia and Birth Asphyxia (P20-P21)	11	1.1	6.2 (3.1, 11.1)
10. Respiratory distress of newborn(P22)	10	1.0	5.6 (2.7, 10.4)

Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

Infant Mortality By Race and Ethnicity

From 2002 to 2021, the annual infant mortality rate among non-Hispanic Black births remained at more than twice that of non-Hispanic White births (Table 3). The non-Hispanic Black infant mortality rate decreased significantly (p-value: .02), with an annual percent change of 1.6% (Figure H). However, the third highest mortality rate among non-Hispanic Black in the last 20 years was reached in 2021 with a rate of 13.6 deaths per 1,000 live births (95% CI: 9.2, 19.3). Infant mortality also dropped significantly (p-value: <.001) among the non-Hispanic White population, with an annual percent change of 2.1%. There was not a statistically significant trend (p-value: .29) in the Hispanic infant mortality rate during this period. Figure H conveys the trend in infant mortality for these three population groups. Due to small sample size and unreliability of estimates, trends are not shown for other population groups.

Figure H. Infant Mortality Rates among the Non-Hispanic White, Non-Hispanic Black, and Hispanic Populations, Kansas 2002-2021



APC = Annual Percent Change
* Trend is statistically significant (p-value < .05).
Source: Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

In 2017-2021, the leading cause of death for non-Hispanic Black infants was Sudden Unexpected Infant Death (Table C). Meanwhile, the leading cause of death among non-Hispanic White and Hispanic infants was congenital Malformations, Deformations and Chromosomal anomalies.

Table C. Infant Deaths Among the Non-Hispanic White, Non-Hispanic Black, and Hispanic Populations, by Leading Causes of Infant Death, Kansas, 2017-2021

Cause of Death (ICD-10 Code) by Population Group	Number of Deaths	Percent of Deaths	Rate* (95% Confidence Interval)
Non-Hispanic White (n=565)			
1. Congenital Malformations, Deformations and Chromosomal Anomalies (Q00-Q99)	156	27.6	127.3 (107.3, 147.3)
2. Sudden Unexpected Infant Death (R95, R99, W75)	115	20.4	93.9 (76.7, 111.0)
3. Disorders Related to Short Gestation and Low Birth Weight, Not Elsewhere Classified (P07)	77	13.6	62.9 (49.6, 78.6)
4. Newborn Affected by Maternal Complications of Pregnancy (P01)	29	5.1	23.7(15.9, 34.0)
Non-Hispanic Black (n=151)			
1. Sudden Unexpected Infant Death (R95, R99, W75)	40	26.5	332.5 (237.5, 452.8)
2. Disorders Related to Short Gestation and Low Birth Weight, Not Elsewhere Classified (P07)	31	20.5	257.7 (175.1, 365.8)
3. Congenital Malformations, Deformations and Chromosomal Anomalies (Q00-Q99)	14	9.3	116.4 (63.6, 195.3)
4. Newborn Affected by Maternal Complications of Pregnancy (P01)	18	11.9	149.6 (88.7, 236.5)
Hispanic, any race (n=210)			
1. Congenital Malformations, Deformations and Chromosomal Anomalies (Q00-Q99)	53	25.2	176.3 (132.1, 230.6)
2. Sudden Unexpected Infant Death (R95, R99, W75)	41	19.5	136.4 (97.9, 185.0)
3. Disorders Related to Short Gestation and Low Birth Weight, Not Elsewhere Classified (P07)	29	13.8	96.5 (64.6, 138.6)
4. Newborn Affected by Maternal Complications of Pregnancy (P01)	12	5.7	39.9 (20.6, 69.7)

* Infant deaths per 100,000 live births. Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

Some statistically significant racial/ethnic disparities were observed in the rate of infant deaths by the leading causes of death, from 2017 to 2021 (Table C). For instance, Non-Hispanic Black births experienced a higher rate of infant deaths where the cause of death was Sudden Unexpected Infant Death as well as a higher short gestation and low birth weight compared to Non-Hispanic White or Hispanic births. (According to Z-statistics analysis, the confidence intervals of infant deaths rate for Non-Hispanic Black births and Non-Hispanic White births overlap and so do those in Non-Hispanic Black births and Hispanic births). There is no statistically significant difference for the cause of infant deaths between Non-Hispanic White births and Hispanic births.

Infant Mortality By Geographic Area

Rates by County

The counties with the highest number of infant deaths during 2017-2021 included Sedgwick (234 or 22.4% infant deaths (1,045)), Johnson (138 or 13.2%), Wyandotte (90 or 8.6%), and Shawnee (84 or 8.0%). These four counties accounted for more than half (52.2%) of all infant deaths (Table 4).
The counties with the highest infant mortality rates (reliable rate, RSE ≤ 30%) during this five-year period included:

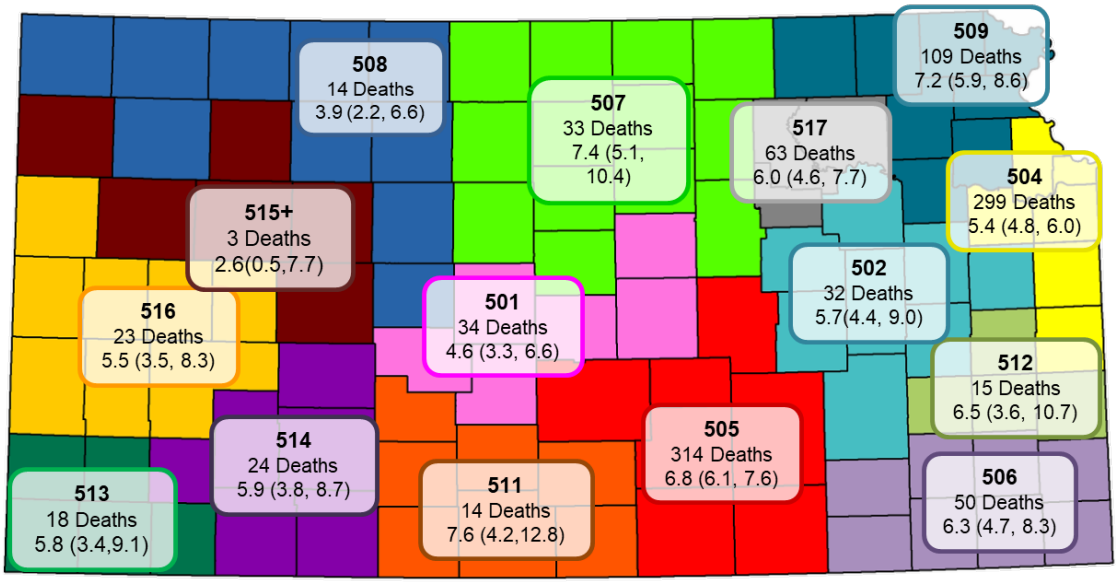
- Sumner (9.6, infant deaths per 1,000 live birth, 95% CI: 4.9,16.7)
- Harvey (9.2, 95% CI: 5.4, 14.7)
- Shawnee (8.2, 95% CI: 6.5, 8.1)
- Wyandotte (7.2, 95% CI: 5.7, 8.8)
- Lyon (7.0, 95% CI: 3.7, 12.0)

The counties with the lowest (non-zero) infant mortality rates (reliable rate, RSE ≤ 30%) during this five-year period included:

- Johnson (3.9, infant deaths per 1,000 live births, 95% CI: 3.3, 4.6)
- Reno (4.3, 95% CI: 2.4, 7.2)
- Douglas (5.4, 95% CI: 3.6, 7.7)
- Ford (5.4, 95% CI: 3.1, 8.8)
- Butler (5.6, 95% CI: 3.4, 8.6)

As the number of deaths was too small for analysis in many counties, counties were combined based on their current Public Health Emergency Preparedness Regions (Figure I). The region with the highest reliable (RSE ≤ 30%) infant mortality rate was the Northeast Corner, at 7.2 deaths per 1,000 live births (95% CI: 5.9, 8.6). The region with the lowest reliable infant mortality rate was the Central Kansas Region, at 4.6 deaths per 1,000 live births (95% CI: 3.2, 6.4).

Figure I. Infant Deaths and Five-Year Average Mortality Rates* with 95% Confidence Intervals by Kansas Health Preparedness Region, 2017-2021 Rates by Urban/Rural Residence



Kansas Public Health Regions

501 - Central Kansas	502 - EC Coalition	504 - KC Metro
505 - KS SC Metro	506 - Lower 8 of SE KS	507 - NC KS Pub Health Initiative
508 - Northwest BT Region	509 - Northeast Corner	511 - SC Coalition
512 - SEK	513 - SW KS Health Initiative	514 - SW Surveillance
515 - WC Pub Health Initiative	516 - Western Pyramid	517 - Wildcat

*Infant deaths per 1,000 live births.
†Numbers too small to calculate rates (Relative Standard Error > 50%).
Source: Bureau of Epidemiology and Public Health Informatics, Kansas Department of Health and Environment

Infant mortality rates were calculated for the county peer groups during 2017-2021 (Table 4). There was not enough evidence to show that infant mortality rates differed significantly between Frontier, Rural, Densely Settled Rural, Semi-Urban, and Urban counties.

However, differences were found when categorizing counties using National Center for Health Statistics (NCHS) urban-rural classification system. Medium metro counties* had a significantly (p-value < .05) higher infant mortality rate (7.0 death per 1,000 live births; 95% CI: 6.2, 7.9) than micropolitan counties** (5.3 deaths per 1,000 live births; 95% CI: 4.6, 6.1), or large fringe metro counties+ (p-value < .05 (4.9 deaths per 1,000 live births; 95% CI: 4.4, 5.5). The large fringe metro counties+ also had a significantly (p-value< .05) lower infant mortality rate than the small metro counties++ (6.8 deaths per 1,000 live births; 95% CI: 5.8, 7.8).

* Butler, Harvey, Kingman, Sedgwick, and Sumner.
** Atchison, Barton, Cowley, Crawford, Ellis, Finney, Ford, Franklin, Geary, Kearny, Labette, Lyon, McPherson, Montgomery, Ottawa, Reno, Saline, and Seward.
+ Johnson, Leavenworth, Linn, Miami, and Wyandotte.
++ Doniphan, Douglas, Jackson, Jefferson, Osage, Pottawatomie, Riley, Shawnee, and Wabaunsee.

Characteristics of Linked Infant Deaths

In this section, a variety of maternal and infant characteristics are presented for infants who died during 2017-2021, from information in linked birth certificates. The statistics of these certificates are based on the period-linked birth death cohort. The birth-death cohort includes infant deaths that occurred during the given years, and births that occurred during the same years. Rates are presented, with the numerator as the number of infants who died during 2017-2021, and the denominator as the number of births during the same period. The linked infant deaths, all infant deaths, and all live births are 978; 1,045; and 177,192, respectively, during the same periods. There were four linked births that were unknown for the specific characteristics of interest, with additional unknowns depending on the characteristic.

In this section, if the confidence intervals of two values did not overlap, it was considered a conservative estimate of a significant difference. Additionally, unless stated otherwise all statistics reported in this section can be found in Figure K and in Tables 9 to 10.

Maternal Race/Ethnicity

Most deceased infants (600, or 61.6% of linked infant deaths where the mother's race/ethnicity was known) were born to non-Hispanic White mothers, corresponding to a rate of 4.9 infant deaths per 1,000 live births that occurred during those years (95% CI: 4.5, 5.3). There were 138 deceased infants born to non-Hispanic Black mothers (14.2% of linked infant deaths where mother's race/ethnicity was known), corresponding to a rate of 11.5 deaths per 1,000 live births (95% CI: 9.5, 13.4). There were 173 deceased infants born to Hispanic mothers (17.8% of linked deaths where the mother's race/ethnicity was known), corresponding to a rate of 5.8 deaths per 1,000 live births (95% CI: 4.9, 6.6).

Birth Weight

Low birth weight had a noticeable relationship with infant mortality. Of the linked infant deaths that occurred during 2017-2021, where birth weight was known, 611 deaths (62.8%) were born at a low birth weight (under 2,500 grams). Low birth weight (under 2500 gram) infant death occurred 46.4 deaths per 1,000 live births (95% CI: 42.7, 50.2), compared to only 2.2 deaths per 1,000 babies born at a normal or higher birth weight (95% CI: 2.0, 2.4). Nearly half (46.9%) of the linked infant deaths where birth weight was known occurred to infants born at a very low birth weight (less than 1,500 grams).

Gestational Age

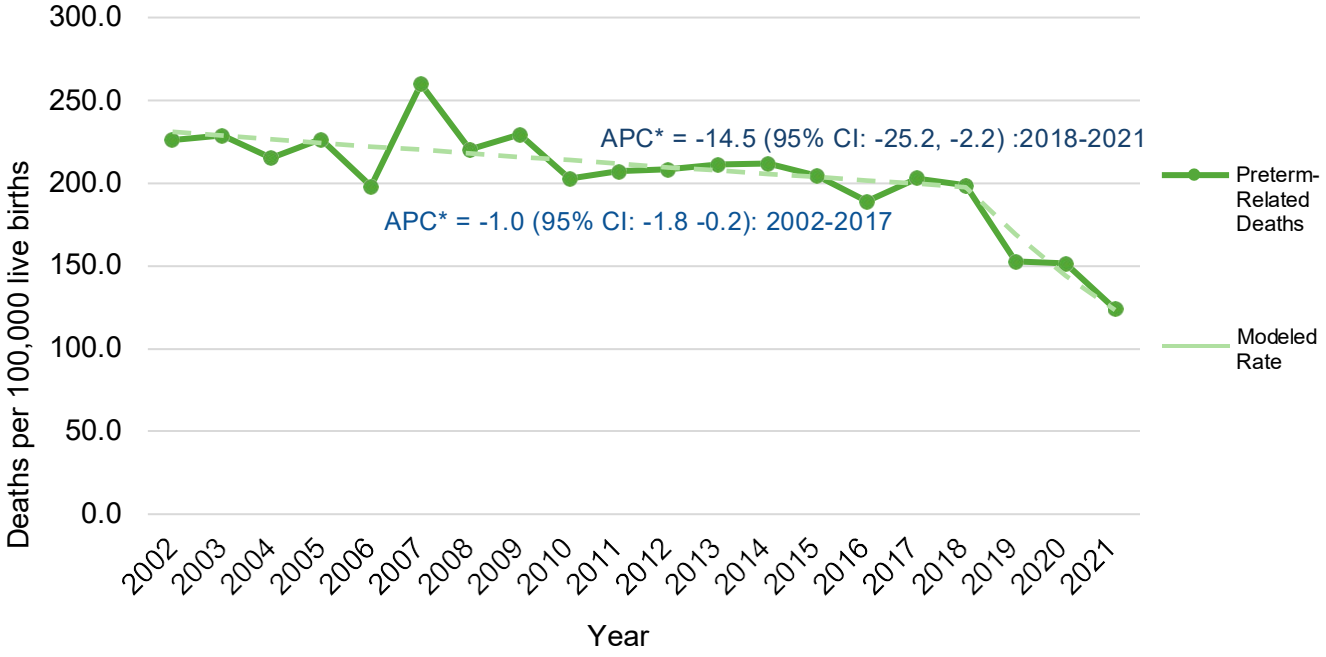
Prematurity is another important factor in infant death. [6] Of the linked infant deaths that occurred during 2017-2021 where gestational age was known, 447 (58.3%) were very premature (less than 32 weeks). The 37 deceased infants (4.8%) were moderately premature (32 to 33 weeks), 106 (13.8%) were late premature (34 to 36 weeks), 177 (23.1%) were early term (37 and 38 weeks). For preterm births that occurred during 2017-2021, there were 3.4 infant deaths (95% CI: 3.1, 3.7) per 1,000 live births. The leading cause of death among premature infants was short gestation and low birth weight (25.9%), followed by congenital anomalies (16.1%),

while the leading cause of death among infants who were born at term was Sudden Unexpected Infant Death (52.3%) (Table 8).

Preterm-Related Mortality

Preterm-related mortality is a standard measure [1, 20] which includes deaths to infants that were born preterm, where the underlying cause of death was within a set of specific ICD-10 code categories (Figure J). From 2002 to 2021, there was a statistically significant (p-value: .02) decrease in the rate of preterm related mortality, with an annual percent change of 1.0 from 2002 to 2018 and the annual percent change of preterm related mortality has fallen by 14.5 from 2018 to 2021. (p-value: .03).

Figure J. Preterm-Related Mortality Rates from Linked Birth-Infant Death File, Kansas, 2002-2021



APC = Annual Percent Change
* Trend is statistically significant (p-value < 0.05).
Preterm-related deaths included infant deaths where the infant was born preterm, with the underlying cause of death assigned to one of the following ICD-10 cause codes: K550, P000, P010, P011, P015, P020, P021, P027, P070-P073, P102, P220-P229, P250-P279, P280, P281, P360-P369, P520-P523, and P77.
Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

In 2017-2021, 295 preterm related deaths were reported, for a rate of 166.5 deaths per 100,000 live births (Table D). The burden of preterm-related mortality was greater among the non-Hispanic Black and Hispanic populations, compared to the non-Hispanic White population (Table D). The preterm-related mortality rate among the non-Hispanic Black population was 448.9 deaths per 100,000 live births. This rate was more than triple that of the non-Hispanic White population (133.9 deaths per 100,000 live births), and more than twice that of the Hispanic population (172.9).

Table D. Preterm-Related Infant Deaths and Five-Year Average Mortality Rates among the Non-Hispanic Black, and Hispanic Populations, Kansas 2017-2021

Race/Ethnicity	Number of Linked Infant Deaths	Preterm-Related Mortality Rate* (95% Confidence Interval)
All	295	166.5(147,185.5)
Non-Hispanic White	164	133.9(113.4,154.4)
Non-Hispanic Black	54	448.9(337.2, 585.7)
Hispanic	52	172.9(129.2, 226.8)

Preterm-related deaths included infant deaths where the infant was born preterm, with the underlying cause of death assigned to one of the following ICD-10 cause codes: K550, P000, P010, P011, P015, P020, P021, P027, P070-P073, P102, P220-P229, P250-P279, P280, P281, P360-P369, P520-P523, and P77.
Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

Maternal Age

The highest percentage of infant deaths occurred among infants whose mothers were aged 25 to 29 years old (31.8%), followed by mothers aged 20 to 24 years old (25.8%), 30 to 34 years old (22.7%), and 35 to 39 years old (9.8%). Births to mothers who were under 20 years had a significantly higher infant mortality rate (8.7 deaths per 1,000 live births, 95% CI: 6.9, 10.8) than among births where the mother was 25 to 34 years old (5.0, 95% CI: 4.6, 5.4) because two confidence intervals are not overlapping. Births to mothers who were 20 to 24 years old also had a significantly higher infant mortality rate (6.7, 95% CI: 5.8, 7.5) than births where the mother was 25 to 34 years old (p-value <.05), or among births where the mother was 35 years or older (1.9, 95% CI: 1.6, 2.3, p-value <.05).

Plurality

Most deceased infants (861, or 88.1%) were singletons at birth, while 110 deceased infants (11.3%) were part of twin deliveries. In total, 116 of the linked infant deaths occurred among plural births (11.9%), corresponding to an infant mortality rate of 20.5 deaths per 1,000 live, plural births (95% CI: 16.7, 24.2). By comparison, for every 1,000 singleton live births, there were 5.0 infant deaths (95% CI: 4.7, 5.4).

Birth Order

The infant mortality rate among infants born with a birth order of one (6.2 deaths per 1,000 live births; 95% CI: 5.6, 6.9), and among infants born with a birth order of four or more (6.6; 95% CI: 5.6, 7.5), were significantly higher than the rate among those with a birth order of two (4.5; 95% CI: 3.9, 5.0) or a birth order of three (5.0; 95% CI: 4.2, 5.7).

Maternal Pre-pregnancy Body-Mass Index (BMI)

More than one-third of linked infant deaths, where BMI was known, were to infants whose mothers were obese (36.7%), and a slightly different percentage (34.6%) were to mothers of normal weight. Maternal obesity was associated with an infant mortality rate of 6.6 deaths per 1,000 live births (95% CI: 5.9, 7.2). This was significantly higher than the mortality rate among births to mothers of normal weight (4.7 deaths per 1,000 live births, 95% CI: 4.2, 5.2), and among births to mothers who were overweight (5.0, 95% CI: 4.3, 5.6). Births to underweight mothers were associated with an infant mortality rate of 7.2 deaths per 1,000 live births (95% CI: 5.0, 10.1).

Maternal Marital Status

For more than half of these (54.3%), the mother was not married at the time of her pregnancy or delivery. The infant mortality rate among births to unmarried mothers (8.3 deaths per 1,000 live births, 95% CI: 7.6, 9.0) was more than twice that of births to married mothers (3.9, 95% CI: 3.6, 4.3).

Pay Source for Delivery

The most common pay source was Medicaid (44.3%), followed by private insurance (41.0%), and self-pay (8.8%). The infant mortality rate among births where Medicaid was the primary payor was 7.9 deaths per 1,000 live births (95% CI: 7.1, 8.6). This was significantly higher than that among births primarily paid for by private insurance (4.0 deaths per 1,000 live births; 95% CI: 3.6, 4.4, p-value<.05). The death rate where a non-Medicaid government program was the primary payor is 5.3 deaths per 1,000 live births (95% CI: 1.7, 12.3) and this rate is not significant different from Medicaid payor case.

Maternal Education

The mother's education level was known for 643 (65.7%) of the linked infant deaths where the mother was aged 24 years or older. The education category associated with the highest percentage of infant deaths was high school diploma/GED (23.6%), followed by some college but no degree (22.9%), and bachelor's degree (16.5%). Among births to mothers aged 24 years and older, births to mothers with at least some college education had the lowest infant mortality rate (3.9 deaths per 1,000 live births, 95% CI: 3.5, 4.2). This rate was significantly lower than among births to mothers aged 24 years and older who did not have a high school diploma or GED (8.4 deaths per 1,000 live births, 95% CI: 6.8, 10.4), and to those who had a high school or GED but no college education (7.3, 95% CI: 6.2, 8.4, p-value<.05).

Prenatal Care Initiation

The month that prenatal care began was known for 951 (97.2%) of the linked infant deaths. For the majority of these (75.2%), the mother had started prenatal care in the first trimester of pregnancy. One in twenty linked

infant deaths (4.4%) had no prenatal care. For every 1000 births in 2017-2021 that did not receive prenatal care, just under three infant deaths occurred (24.9 deaths per 1,000 live births; 95% CI: 17.9, 33.8). In comparison, among births with first-trimester initiation of prenatal care, the infant mortality rate was only 5.0 deaths per 1,000 live births (95% CI: 4.7, 5.4). The infant mortality rate among births with second-trimester initiation of prenatal care was also significantly higher than among births with first-trimester prenatal care (p-value< .05, at 6.6 deaths per 1,000 live births (95% CI: 5.6, 7.6).

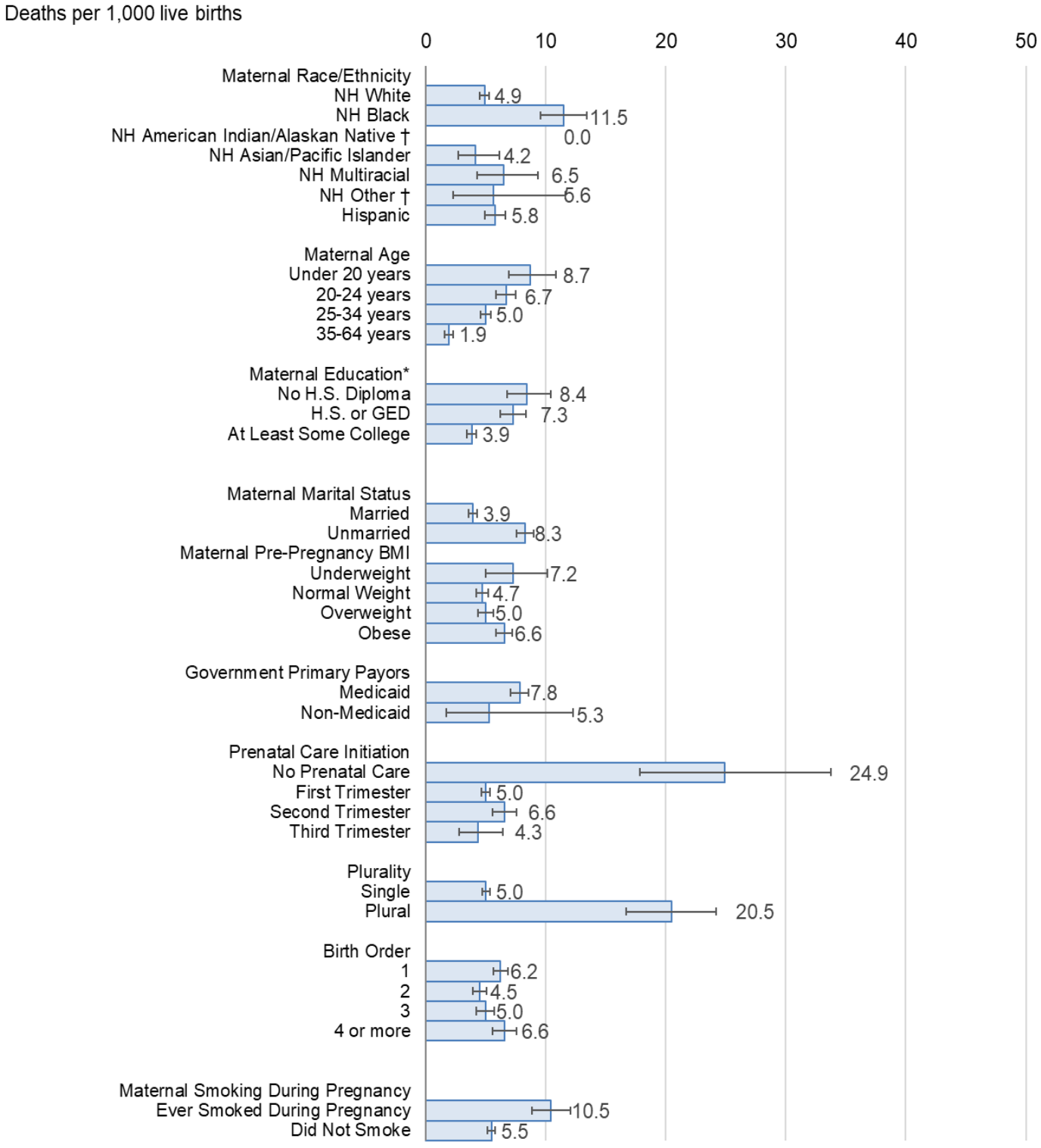
Adequacy of Prenatal Care Utilization (APNCU) Index

The APNCU index was known for 949 linked deaths (97.0%) that occurred in 2017-2021. The 42.8% of linked infant deaths had Adequate Plus prenatal care and 7.7 deaths per 1000 live births (95% CI:7.0,8.5) in this case. The 28.7% of linked infant deaths had Adequate care (2.9 deaths per 1000 live births: 95% CI: 2.6,3.2), 10.6% of linked infant deaths had Intermediate care (10.3 deaths per 1000 live births; 95%CI: 8.3,12.3), and 17.9% of linked infant deaths had Inadequate care (9.0 deaths per 1000 live births; 95%CI: 7.7,10.4).
In general, among all births that occurred in 2017-2021, where information for the APNCU index was available (Table10), 1.1% received Inadequate prenatal care, 10.6% received Intermediate care, 53.0% received Adequate care, and 29.7% received Adequate Plus care. In interpreting the APNCU index, it is important to remember that this is a quantitative measure that accounts only for timing and number of visits. It may not be an effective measure of the quality of care received, especially among high-risk pregnancies.

Maternal Smoking Status

Smoking status was known for 965 linked infant deaths (98.7%). For 16.6% of these, smoking at some time during pregnancy had been reported. Births to smokers had more than twice the infant mortality rate (10.5 deaths per 1,000 live births, 95% CI: 8.8, 12.1) of births to nonsmokers (4.6, 95% CI: 4.2, 4.9).

Figure K. Five-Year Average Infant Mortality Rates by Selected Characteristics from the Linked Birth-Infant Death File, Kansas 2017-2021



NH = Non-Hispanic
Error bars represent 95% confidence intervals.
† Estimate is statistically unreliable (Relative Standard Error > 30%).
* Mothers over 24 years
Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics

Discussion

The overall infant mortality rate in Kansas declined significantly from 2002 to 2021. Other promising trends in the rate of stillbirths and infant mortality since 2000 include declines in infant mortality among the non-Hispanic White and non-Hispanic Black populations, and a decrease in both perinatal mortality and preterm-related mortality.

The rate of stillbirths increased in Kansas from 2002 to 2021. The increase in recent years may be partially due to changes in the state's fetal death reporting law during 2014. Nevertheless, it fell under a rate of 5.0 in 2020 for the first time since 2013. However, this rate increase to 5.6 in 2021. Over this twenty-year period, Kansas experienced a decline in the rate of perinatal deaths, which include stillbirths of at least 28 weeks gestation, and deaths to infants under 7 days of age.

The infant mortality rate in Kansas in 2021 (5.3 deaths per 1,000 live births) was consistent with the overall rate for the United States in the same year, which was 5.4. [17] Kansas did not meet the Healthy People 2030 objective of no more than 5.0 deaths per 1,000 live births but it is close to the objective. The non-Hispanic White population was below the target rate and Hispanic populations got to close to the objective, while the rate of the non-Hispanic Black was far from the objective rate. From 2002 to 2021, the infant mortality rate among non-Hispanic White and non-Hispanic Black births decreased significantly with corresponding p-value of <.001 and 0.024. No statistically significant (p-value: .29) improvements in infant mortality were seen for Hispanic births.

Some areas in the state continued to see higher infant mortality than others. Harvey, Shawnee and Sumner counties had the highest infant mortality rates. Meanwhile, counties with the lowest infant mortality rates included Johnson, Reno and Douglas counties.

Leading causes of infant death included congenital anomalies, disorders related to short gestation and low birth weight and Sudden Unexpected Infant Death. The burden of SUID particularly impacted the non-Hispanic Black population. Disorders related to congenital malformations, deformations and chromosomal anomalies were the leading cause of death for Hispanic and Non-Hispanic white infants. Non-Hispanic Black births also experienced a higher rate of preterm-related deaths than Hispanic or non-Hispanic White.

Technical Notes

Statistical Methodology

Crude Rates. Infant mortality and stillbirth rates were calculated per year, per a combination of years and for specific subpopulations. Due to the relatively small number of infant deaths and stillbirths each year, preselected intervals of years were combined to increase data reliability. The five most recent years of data were combined for characteristic analysis and intervals of 20 years and approximately 100 years were used for trend analysis. The long-term (~100 years) infant mortality numbers and rates may be underreported due to incomplete data collection in the early 1900s.

Data Suppression. The relative standard error (RSE) was used to evaluate reliability of rates. Values with a RSE of 30 percent or less were considered reliable. Values with RSE greater than 30 percent but less than 50 percent were considered unreliable and rates with RSE greater than 50 percent have been suppressed in this document.

Statistical Significance. The following statistical tests have been applied where statistically significant differences have been noted in this document. When counts were ≥100, a normal distribution was assumed and the z-test was used to compare two infant mortality rates. [22] When counts were <100, a Poisson probability distribution was assumed and confidence intervals were calculated at the 95% confidence level to compare two infant mortality rates. If the confidence intervals of two values did not overlap, it was considered a conservative estimate of a significant difference. Caution should be used in interpreting these differences, due to the relatively small number of occurrences and yearly fluctuations.

Trend Analysis. Poisson JoinPoint regression was performed to model trends and the annual percent change (APC) was used to characterize the trend over time.[23,24] Statistical significance was considered as a p-value of less than 0.05. Where the numerator was less than 20 or the denominator was less than 50, years were combined into five-year intervals and rolling averages were calculated.

Inclusion of Stillbirths. Stillbirths are also included in this report. These events may have risk factors like those for infant deaths. In Kansas, as of July 2014, a stillbirth is defined as complete expulsion or extraction from its mother of a human child the gestational age of which is not less than 20 completed weeks, resulting in other than a live birth and which is not an induced termination of pregnancy. [19] The law prior to 2014 required stillbirths to be reported when fetal weight was greater than 350 grams. The change may result in slightly different counts because of the different definitions of stillbirth and implementation occurring mid-year. The reporting certificate did not change. The new definition resulted in more events being reported. For consistency, in this publication, only stillbirths of at least 20 weeks gestation were included, for all years.

Pre-Term Related Deaths. Following the definitions of the Federally Available Data guidance, provided by the KDHE Bureau of Maternal and Child Health, the national standard for reporting pre-term related deaths is by 100,000. [20]

Residency. All data reported are based on Kansas residence, unless otherwise noted.

Linkage to Birth Records

This report also provides findings based on the linking of birth certificate and infant death certificate data. Where referenced, the linked birth/infant death statistics are based on the period-linked birth death cohort. The birth-death cohort includes infant deaths that occurred during the given years, and births that occurred during the same years. [22]

The birth/infant death data analyzed are based on a union of single year linked birth/infant death files created six months after a given event year ended. Linkage of the respective records is performed by the BEPHI Public Health Informatics group using deterministic methodology based on the presence of a birth certificate identification number in the death history file. A manual matching process is used for infant deaths that do not match automatically. Because of the timeframe for creating the annual linked birth/infant death statistical files, infant death reports received later than six months after the end of a given event year are not included in the given event year.

To obtain statistically reliable state specific data stratified by race and ethnicity, it is necessary to combine years. For this report, five years of linked birth/infant deaths were combined to obtain statistically reliable data for stratification on characteristic variables. Linked data are an important tool to examine infant mortality comparisons between Kansas and other Jurisdictions, or the United States. In Kansas, between 2017 and 2021, there were 1,045 resident infant deaths reported to KDHE (Table E). Of those, 978 (93.6%) were linked to a birth certificate.

This method of linking the infant death and their birth records is valuable for exploring the various relationships of the infant deaths with factors surrounding birth and with mothers' risk factors. The death file contains age at death and underlying cause. The birth file contains birth weight, gestational age and information on the mother such as age, marital status, educational level and maternal risk factors such as tobacco use.

Table E. Percent of Infant Deaths Linked to Birth Records and Infant Mortality Rate, Kansas, 2017-2021

	Total Infant Deaths		Linked Infant Deaths		
Year	Number	Rate per 1,000 Live Birt	Number	Percent Linked	Rate per 1,000 Live Births
Total	1045	5.9	978	93.6	5.5
2017	217	6.0	214	98.6	5.9
2018	231	6.4	227	98.3	6.3
2019	189	5.3	183	96.8	5.2
2020	224	6.5	195	87.1	5.7
2021	184	5.3	159	86.4	4.6

Source: Kansas Department of Health and Environment, Bureau of Epidemiology and Public Health Informatics.

Notes on Transition to the 2003 Birth Certificates

Data for 2005 and years following are based on Kansas implementation of the 2003 revision of the U.S. Standard Certificates of Live Birth, Death and Stillbirth. Data for prior years is based on the 1989 revision of the U.S. Standard Certificate of Live Birth, Death, and Stillbirth. Data analysis involving the 2005 Kansas Certificate of Live Birth is affected in several ways:

- Changes in both question wording and sources for the information collected make it inappropriate to evaluate trends across 2004 and 2005 in some variables such as month prenatal care began and education level
- Calculating Month Prenatal Care Began – prior to 2005 – the mother was asked for the month prenatal care began. Starting in 2005, the dates used to calculate the month prenatal care began included the first day of the last menses before pregnancy and the date of the first prenatal visit. This change makes rates calculated after 2004 incompatible with earlier years. Such comparisons are inappropriate.
- KDHE publishes data on resident births and deaths. If the event occurs out of state and the state is not using the 2003 revision of the birth certificate, missing data may result. This is an important factor in border counties
- KDHE excludes unknowns from the denominator for all calculations that result in percentage rates involving birth data. Other states may choose to include unknowns in the denominator. The Kansas method provides a more accurate representation of the rates.
- The 2003 revision process resulted in recommendations that the prenatal care information be gathered from the prenatal care or medical records, whereas the 1989 revision did not recommend a source for these data. In the case of premature births, sometimes these records are not available when the infant is delivered.
- Infant mortality rates reported by NCHS may vary slightly from rates reported by KDHE. NCHS rates are based on data reported to it by all states. Some of those out-of-state occurrence infant deaths may

not be reported to KDHE in time for inclusion in the respective year's Annual Summary of Vital Statistics or subsequent reports.

- Percentages may not add to 100 percent due to rounding.

Notes on Specific Variables & Terms

Infant Age at Death. The first year of life can be categorized by two major periods, the neonatal period (first 27 days of life) and the post neonatal period (28 to 364 days of life). Infant deaths occurring in the neonatal period are also further sub-divided into the hebdomadal deaths (0-6 days) and post-hebdomadal deaths (7-27 days).

Gestational Age. The obstetric estimate of gestational age was coded in weeks. Consistent with NCHS practice, for infants, any gestational age outside of 17-47 weeks was recoded as unknown.[20,25] Preterm births were those of less than 37 weeks. Early term births were considered as those at 37-38 weeks.
Only stillbirths of at least 20 weeks gestation were included in this report, consistent with the change in fetal death reporting requirements in Kansas, which occurred in mid-2014. Stillbirths of unknown gestational age were excluded from this report.

Perinatal Mortality. Consistent with NCHS practice, in this report, a perinatal death was defined as a death occurring to an infant fewer than 7 days old, or to a fetus of at least 28 weeks gestation.[20,26] This differs from the definition used in the Annual Summary of Vital Statistics, 2021.[18] In the Annual Summary of Vital Statistics, Perinatal death (definition III) includes infant deaths that occur at less than 7 days of age and fetal deaths with a stated or presumed gestation of 20 weeks or more.

Cause of Death. The cause of death referred to in this report is the primary or underlying cause of death. It is defined as the disease or injury which initiated the chain of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury. The underlying causes of death are established through a system known as the International Statistical Classification of Diseases and Related Health Problems,10th Revision (ICD-10).[27] This system promotes uniformity and comparability in the collection and presentation of mortality data. Causes of death were ranked according to the NCHS Instruction Manual, Part 9, ICD-10 Cause-of Death Lists for Tabulating Mortality Statistics, Effective 1999. [28] The list of 130 Selected Causes of Infant Death was used for infant deaths, and the list of 124 Selected Causes of Fetal Death was used for stillbirths. There is one exception. In this report, when ranking leading causes of infant death, sudden infant death syndrome (SIDS) deaths (ICD-10 code R95) are combined with accidental suffocation and strangulation in bed (ICD-10 code W75) and unknown cause (ICD-10 code R99). This combination is known as Sudden Unexpected Infant Death (SUID). [20,29]

Population Groups. This report uses the concept of reporting race and Hispanic origin combined into distinct categories of population groups. This was done to preserve the self-reported information on race and origin reported in the expanded categories. The use of population groups assures a better uniformity of the numerators and denominators in rate calculations. Because of different tabulation methods, totals for population groups may not equal those tabulated by either race or Hispanic origin individually. Rates calculated

exclusively on Hispanic origin treat unknowns differently. The aggregation grid for population groups is listed in the Annual Summary of Vital Statistics, 2020.[18] Application of this grid assures that every combination of race and origin is assigned to a population group. In instances where the Hispanic origin of an individual is unknown, the person is assigned to a population group solely based on race and is considered non-Hispanic.
In the death certificate statistics (unlinked data) of this document, the population groups are classified using the race/ethnicity of the decedent as reported on the death certificate. The funeral director supplies this information, which is provided by an informant such as a family member.
In the linked birth/infant death statistics, the population groups are classified using the race/ethnicity reported on the birth certificate for the mother. For more information on the population groups, see the Technical Notes in the Annual Summary of Vital Statistics, 2020. [18]

Mother's Age. In this report, maternal age values outside the range of 10-64 years were recoded as unknown.

Body-mass Index. Body-mass index was calculated using the mother's height and pre-pregnancy weight. Only values within the range of 13.0-69.9 were included. All other values were considered unknown.

County Peer Group and Urban-Rural Classifications. The county of residence was determined from the Federal Information Processing Standards (FIPS) code for each Kansas county. Beginning in 2011, events with unknown county FIPS codes are included in that year's total counts. Prior to 2011, they were excluded.
For various demographic studies, it is useful to consider groups of counties with similar characteristics. "Peer Groups" of counties, as used in this summary, are defined as those with similar population density based on a method derived by the KDHE Bureau of Community Health Systems (Table E). The peer county grouping system should not be confused with other definitions of urban and rural areas. The KDHE Bureau of Epidemiology and Public Health Informatics applies these definitions, updating the groups with every decennial census. Based on the 2010 U.S. Census, eight Kansas counties changed peer groups. In order to facilitate a time series comparison, Peer-Group statistics for prior years are based on the Peer-Group in effect during that decade. Sources for calculation of population densities are population figures from the 2010 U.S. Census and land areas from the 2010 U.S. Census.
In addition to peer groups, this report utilizes an urban-rural classification scheme published by the National Center for Health Statistics (NCHS) in 2014 [30]. The Appendix lists each Kansas county by its peer groups based on the 2000 and 2010 Census, respectively, as well as its NCHS 2013 urban-rural category.

Table F. Urban-Rural Classification Scheme, Based on the Kansas County

Kansas County Peer Groups	
Category	**Description**
Frontier	< 6.0 persons per square mile
Rural	6.0-19.9 persons per square mile
Densely-Settled Rural	20.0-39.9 persons per square mile
Semi-Urban	40.0-149.9 persons per square mile
Urban	150.0+ persons per square mile

Table G. 2013 Urban-Rural Classification Scheme by the National Center for Health Statistics

NCHS 2013 Urban-Rural Classification Scheme	
Category	**Description**
Rural	
Noncore	Nonmetropolitan counties that did not qualify as micropolitan
Micropolitan	Counties in micropolitan statistical areas
Urban	
Small metro	Counties in metropolitan statistical areas of populations less than 250,000
Medium metro	Counties in metropolitan statistical areas of populations less than 250,000 to 999,999
Large fringe metro	Counties in metropolitan statistical areas of 1 million or more population that did not qualify as large central metro counties
Large central metro*	Counties in metropolitan statistical areas of 1 million or more population that: • contain the entire population of the largest main city of the metropolitan statistical area, or • whose entire population is within the largest main city of the metropolitan statistical area, or • contain at least 250,000 residents of any main city of the metropolitan statistical area

Limitations

This report's findings are subject to several limitations. An important concern is the issue of receiving vital events from other states within the KDHE reporting deadline. Vital statistics are gathered on an occurrence basis but are traditionally reported on a residence basis. For complete residence statistics, reports must be received from other states for events occurring to Kansas residents. Delays or other late reporting may result in some out-of-state vital events not being received by KDHE by the cutoff date of June 30 of the year following the event year. Past evaluations indicate that over 99 percent of all vital events to Kansas residents are received before the cutoff date.

Evaluation of the linked birth/infant death cohort is subject to limitations due to the inability to link all deaths to a corresponding birth report. This inability may be due to several reasons related to receipt of the corresponding record from another state, name differences between the two reports, both events not occurring in Kansas, or residency changes.

Additionally, comparison of Kansas linked data to other state or national data has limitations due to the timeliness of the national reports as well as differences in methodology. As mentioned earlier, out-of-state births may not be available to match infant deaths at the state level but are available for matching at the national level.

The ICD-10 death classification system limits the bias of human coding of mortality information. The system also attempts to reduce the impact of spelling errors or placement of literal information in the cause of death fields. One limitation is the system's inability to account for differences in knowledge and attitudes among physicians who complete the cause of death information. Individual biases, unfamiliarity with the patient, or inability to perform an autopsy may affect the information available to the physician when certifying the cause of death. While many death certificates contain four full lines of detailed information on the events or illnesses leading up to the death, some death certificates contain only limited information.

A weakness in relation to stillbirth reporting is that the causes of stillbirths are not as well documented as those of infant deaths. Additionally, since KSA 65-2401 was revised in mid-2014 to change the stillbirth reporting requirements from weight of the fetus (>350 grams) to length of gestation (≥ 20 weeks), vital records data for this year may not represent a consistent picture of all stillbirths.[19]

In general, the accuracy of the information presented in this report depends on the quality of the birth and death certificate information that was reported to KDHE. Some characteristics of the mother and delivery, such as smoking status, may be underreported, which may affect their reliability. The analysis of risk factors that was performed in this report was intended only as a preliminary step toward assessing risk factors and causality for infant mortality. A more detailed analysis would be needed to investigate the extent to which each of these factors influences the risk for infant mortality. Finally, due to small sample size and unreliability of estimates, this report did not deeply explore trends in infant mortality among non-Hispanic Native American/Alaskan Native, non-Hispanic Asian/ Pacific Islander, non-Hispanic other race and non-Hispanic multiracial populations.

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Appendix A

Table 1
Births, Stillbirths, Perinatal Deaths, and Infant Deaths by Year and Period of Death
Kansas, 2001-2021

Year	Total * Deliveries	Live Births	Stillbirths at ≥20 weeks	Stillbirths at ≥28 Weeks	Hebdomadal † Deaths	Perinatal ‡ Deaths	Neonatal § Deaths	Postneonatal ¶ Deaths	Infant # Deaths	Perinatal III Deaths
2002	39,475	39,338	137	89	155	244	192	90	282	292
2003	39,551	39,353	198	117	138	255	177	85	262	336
2004	39,728	39,553	175	109	144	253	176	108	284	319
2005	39,894	39,701	193	129	153	282	196	101	297	346
2006	41,076	40,896	180	126	137	263	176	117	293	317
2007	42,134	41,951	183	121	163	284	211	122	333	346
2008	41,993	41,815	178	116	160	276	193	110	303	338
2009	41,596	41,388	208	126	144	270	176	114	290	352
2010	40,603	40,439	164	106	143	249	170	83	253	307
2011	39,811	39,628	183	112	121	233	157	90	247	304
2012	40,498	40,304	194	136	142	278	173	81	254	336
2013	38,977	38,805	172	113	140	253	166	82	248	312
2014	39,391	39,193	198	103	138	241	175	71	246	336
2015	39,357	39,126	231	102	132	234	160	70	230	363
2016	38,298	38,048	250	138	119	257	145	78	223	369
2017	36,647	36,464	183	89	128	217	154	63	217	311
2018	36,464	36,268	196	88	136	224	162	69	231	332
2019	35,587	35,395	192	88	101	189	118	71	189	293
2020	34,535	34,368	167	95	116	211	148	76	224	283
2021	34,891	34,697	194	116	87	203	106	78	184	281

*Total Deliveries = Live births + stillbirths at ≥20 weeks.

†Hebdomadal Deaths = Deaths at less than 7 days of age.

‡Perinatal Deaths = Stillbirths at ≥28 weeks + hebdomadal deaths.

§Neonatal Deaths = Deaths at less than 28 days of age.

¶Postneonatal Deaths = Deaths between 28 days and 1 year of age.

#Infant Deaths = Deaths under 1 year of age.

Perinatal death, definition **III**, includes infant **deaths** that occur at less than 7 days of age and fetal deaths with a stated or presumed gestation of 20 weeks or more.

Residence data

Source: Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment

Table 2
Stillbirth, Perinatal Mortality, and Infant Mortality Rates by Period of Death
Kansas, 2001-2020

Year	Stillbirths at ≥20 Weeks*	Hebdomadal Deaths‡	Perinatal Deaths†	Neonatal Deaths‡		Postneonatal Deaths‡	Infant Deaths‡	
				KS	US		KS	US
2002	3.5	3.9	6.2	4.9	4.7	2.3	7.2	7.0
2003	5.0	3.5	6.5	4.5	4.6	2.2	6.7	6.9
2004	4.4	3.6	6.4	4.4	4.5	2.7	7.2	6.8
2005	4.8	3.9	7.1	4.9	4.5	2.5	7.5	6.9
2006	4.4	3.3	6.4	4.3	4.5	2.9	7.2	6.7
2007	4.3	3.9	6.8	5.0	4.4	2.9	7.9	6.8
2008	4.2	3.8	6.6	4.6	4.3	2.6	7.2	6.6
2009	5.0	3.5	6.5	4.3	4.2	2.8	7.0	6.4
2010	4.0	3.5	6.1	4.2	4.1	2.1	6.3	6.2
2011	4.6	3.1	5.9	4.0	4.1	2.3	6.2	6.1
2012	4.8	3.5	6.9	4.3	4.0	2.0	6.3	6.0
2013	4.4	3.6	6.5	4.3	4.0	2.1	6.4	6.0
2014	5.0	3.5	6.1	4.5	3.9	1.8	6.3	5.8
2015	5.9	3.4	6.0	4.1	3.9	1.8	5.9	5.9
2016	6.5	3.1	6.7	3.8	3.9	2.1	5.9	5.9
2017	5.0	3.5	5.9	4.2	3.8	1.7	6.0	5.8
2018	5.4	3.7	6.2	4.5	3.8	1.9	6.4	5.7
2019	5.4	2.9	5.3	3.3	3.7	2.0	5.3	5.6
2020	4.8	3.4	6.1	4.3	3.6	2.2	6.5	5.4
2021	5.6	2.5	5.8	3.1	3.5	2.2	5.3	5.4

*Per 1,000 (live births + stillbirths at ≥20 weeks).

†Per 1,000 (live births + stillbirths at ≥28 weeks).

‡Per 1,000 live births.

Source: Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment
National Vital Statistics System: CDC

Table 3

Infant Deaths and Mortality Rates*

By Selected Population Group of Mother[§]

Kansas, 2002-2021

Year	White Non-Hispanic[†]			Black Non-Hispanic[†]			Hispanic Any Race			Black NH[‡] to White NH[‡] Ratio of Rates	Black NH[‡] to Hispanic Ratio of Rates	Hispanic to White NH[‡] Ratio of Rates	Total Infant** Mortality Rate
	Live Births	Infant Deaths	Rate	Live Births	Infant Deaths	Rate	Live Births	Infant Deaths	Rate				
2002	29,811	187	6.3	2,845	44	15.5	5,006	40	8.0	2.5	1.9	1.3	7.2
2003	29,482	172	5.8	2,730	40	14.7	5,417	45	8.3	2.5	1.8	1.4	6.7
2004	29,624	200	6.8	2,782	46	16.5	5,458	28	5.1	2.4	3.2	0.8	7.2
2005	28,903	181	6.3	2,670	45	16.9	6,073	52	8.6	2.7	2.0	1.4	7.5
2006	29,392	181	6.2	2,801	49	17.5	6,568	41	6.2	2.8	2.8	1.0	7.2
2007	30,170	205	6.8	2,856	56	19.6	6,676	56	8.4	2.9	2.3	1.2	7.9
2008	29,863	184	6.2	2,936	39	13.3	6,781	57	8.4	2.2	1.6	1.4	7.2
2009	29,471	178	6.0	2,830	44	15.5	6,790	40	5.9	2.6	2.6	1.0	7.0
2010	29,000	142	4.9	2,780	33	11.9	6,407	50	7.8	2.4	1.5	1.6	6.3
2011	28,382	150	5.3	2,708	35	12.9	6,293	42	6.7	2.4	1.9	1.3	6.2
2012	28,995	145	5.0	2,682	38	14.2	6,286	54	8.6	2.8	1.6	1.7	6.3
2013	27,821	137	4.9	2,549	39	15.3	6,139	44	7.2	3.1	2.1	1.5	6.4
2014	28,009	146	5.2	2,629	29	11.0	6,129	40	6.5	2.1	1.7	1.3	6.3
2015	27,717	130	4.7	2,585	27	10.4	6,290	48	7.6	2.2	1.4	1.6	5.9
2016	26,786	139	5.2	2,494	38	15.2	6,300	32	5.1	2.9	3.0	1.0	5.9
2017	25,431	120	4.7	2,463	29	11.8	5,945	43	7.2	2.5	1.6	1.5	6.0
2018	25,196	122	4.8	2,499	25	10.0	5,976	54	9.0	2.1	1.1	1.9	6.4
2019	24,400	101	4.1	2,419	26	10.7	6,069	39	6.4	2.6	1.7	1.6	5.3
2020	23,517	115	4.9	2,369	40	16.9	5,965	42	7.0	3.5	2.4	1.4	6.5
2021	23,965	107	4.5	2,280	31	13.6	6,114	32	5.2	3.0	2.6	1.2	5.3

* Rate per 1,000 live births.

[†] Due to changes in the collection of the race item on certificates, use caution when comparing data from 2005 onward, to prior years. See Technical Notes.

[‡] NH = non-Hispanic, population group includes unknown Hispanic origin.

[§] Data for other non-Hispanic races are not included in this table due to small numbers, but are available upon request. Inquiries can be sent by email to KDHE.HealthStatistics@ks.gov.

Residence data

Source: Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment

Table 4
Infant Deaths and Mortality Rates by County of Residence
Peer Group, and Urban-Rural Classification*
Kansas, 2017-2021

County of Residence	Year					Total Infant Deaths	Total Live Births	Rate†	95% Confidence Intervals	
	2017	2018	2019	2020	2021	2017-2021	2017-2021	2017-2021	Lower	Upper
Kansas	217	231	189	224	184	1045	177,192	5.9		
Allen	0	4	1	0	0	5	689	7.3 ‡	2.4	16.9
Anderson	1	1	0	1	0	3	486	na	na	na
Atchison	0	0	2	1	1	4	899	na	na	na
Barber	2	1	0	0	0	3	240	na	na	na
Barton	0	1	1	3	3	8	1,554	5.1 ‡	2.2	10.1
Bourbon	2	0	2	3	0	7	994	7.0 ‡	2.8	14.5
Brown	4	0	0	0	0	4	593	na ‡	na	na
Butler	6	5	2	4	3	20	3,576	5.6	3.4	8.6
Chase	0	0	0	0	0	0	125	0.0	0.0	0.0
Chautauqua	0	0	0	0	1	1	154	na	na	na
Cherokee	0	2	1	3	3	9	1,093	8.2 ‡	3.8	15.6
Cheyenne	0	0	0	0	0	0	155	0.0	0.0	0.0
Clark	0	1	0	0	0	1	111	na	na	na
Clay	0	0	0	0	0	0	422	0.0	0.0	0.0
Cloud	3	1	1	0	3	8	540	14.8 ‡	6.4	29.2
Coffey	0	0	0	0	0	0	411	0.0	0.0	0.0
Comanche	0	0	0	0	0	0	75	0.0	0.0	0.0
Cowley	5	2	2	1	3	13	1,995	6.5 ‡	3.5	11.1
Crawford	4	1	3	4	3	15	2,237	6.7	3.8	11.1
Decatur	0	0	0	0	0	0	141	0.0	0.0	0.0
Dickinson	3	1	2	1	4	11	959	11.5 ‡	5.7	20.5
Doniphan	1	1	1	0	0	3	375	na	na	na
Douglas	11	6	3	6	3	29	5,417	5.4	3.6	7.7
Edwards	0	1	0	0	0	1	147	na	na	na
Elk	0	0	0	0	1	1	102	na	na	na
Ellis	1	1	1	2	0	5	1,501	3.3 ‡	1.1	7.8
Ellsworth	0	0	1	0	0	1	279	na	na	na
Finney	3	4	5	2	3	17	2,922	5.8	3.4	9.3
Ford	1	5	3	3	4	16	2,948	5.4	3.1	8.8
Franklin	1	0	2	2	3	8	1,418	5.6 ‡	2.4	11.1
Geary	5	6	3	7	6	27	4,707	5.7	3.8	8.3
Gove	0	0	0	0	0	0	166	0.0	0.0	0.0
Graham	1	0	0	0	1	2	114	na	na	na
Grant	0	2	1	0	1	4	554	na	na	na
Gray	0	0	1	1	0	2	413	na	na	na
Greeley	0	0	0	1	0	1	87	na	na	na
Greenwood	1	1	2	0	0	4	267	na	na	na
Hamilton	1	0	0	0	0	1	180	na	na	na
Harper	1	1	0	0	0	2	337	na	na	na
Harvey	3	5	3	2	4	17	1,848	9.2	5.4	14.7
Haskell	1	0	0	0	0	1	277	na	na	na
Hodgeman	0	0	0	1	0	1	78	na	na	na
Jackson	1	1	0	2	1	5	844	5.9 ‡	1.9	13.8
Jefferson	2	0	0	0	2	4	863	na	na	na
Jewell	0	0	0	0	1	1	136	na	na	na
Johnson	25	27	31	30	25	138	35,124	3.9	3.3	4.6
Kearny	0	1	0	0	0	1	317	na	na	na
Kingman	1	0	0	0	1	2	364	na	na	na
Kiowa	0	0	0	0	0	0	142	0.0	0.0	0.0
Labette	1	0	0	2	0	3	1,246	na ‡	na	na
Lane	0	0	0	0	0	0	76	0.0	0.0	0.0
Leavenworth	11	6	7	4	4	32	4,668	6.9	4.7	9.7
Lincoln	0	0	0	1	0	1	133	na	na	na
Linn	0	1	0	1	1	3	496	na	na	na
Logan	0	0	0	0	0	0	186	0.0	0.0	0.0
Lyon	2	6	2	1	2	13	1,849	7.0	3.7	12.0
McPherson	1	1	0	0	0	2	1,529	na ‡	na	na
Marion	0	0	3	1	0	4	588	na	na	na
Marshall	1	1	0	1	0	3	569	na	na	na
Meade	0	1	0	2	0	3	267	na	na	na

Table 4
Infant Deaths and Mortality Rates by County of Residence
Peer Group, and Urban-Rural Classification*
Kansas, 2017-2021

County of Residence	Year					Total Infant Deaths	Total Live Births	Rate†	95% Confidence Intervals	
	2017	2018	2019	2020	2021	2017-2021	2017-2021	2017-2021	Lower	Upper
Miami	1	1	2	2	1	7	1,783	3.9 ‡	1.6	8.1
Mitchell	1	0	0	0	0	1	361	na	na	na
Montgomery	3	0	2	2	3	10	1,736	5.8 ‡	2.8	10.6
Morris	0	0	0	0	0	0	268	0.0	0.0	0.0
Morton	0	2	0	0	0	2	187	na	na	na
Nemaha	0	1	1	0	0	2	694	na	na	na
Neosho	1	3	2	3	1	10	929	10.8 ‡	5.2	19.8
Ness	1	0	0	0	0	1	141	na	na	na
Norton	0	1	0	0	0	1	270	na	na	na
Osage	3	0	0	0	2	5	834	6.0 ‡	1.9	14.0
Osborne	0	0	0	0	0	0	210	0.0	0.0	0.0
Ottawa	0	0	2	2	1	5	283	17.7	5.7	41.2
Pawnee	0	1	0	0	0	1	324	na	na	na
Phillips	0	0	0	0	2	2	264	na	na	na
Pottawatomie	2	0	1	6	3	12	1,798	6.7 ‡	3.4	11.7
Pratt	0	4	1	0	1	6	533	11.3 ‡	4.1	24.5
Rawlins	0	0	0	0	0	0	147	0.0	0.0	0.0
Reno	5	2	2	4	1	14	3,251	4.3	2.4	7.2
Republic	0	0	2	0	0	2	255	na	na	na
Rice	2	0	0	1	0	3	519	na	na	na
Riley	3	10	4	3	4	24	3,990	6.0	3.9	8.9
Rooks	0	0	0	1	0	1	264	na	na	na
Rush	0	0	0	0	0	0	137	0.0	0.0	0.0
Russell	0	0	0	0	0	0	356	0.0	0.0	0.0
Saline	7	6	2	2	2	19	3,221	5.9	3.6	9.2
Scott	0	0	0	0	1	1	332	na	na	na
Sedgwick	44	57	36	52	45	234	33,404	7.0	6.1	7.9
Seward	1	2	3	2	2	10	1,938	5.2 ‡	2.5	9.5
Shawnee	22	16	12	21	13	84	10,250	8.2	6.5	10.1
Sheridan	0	0	0	0	0	0	141	0.0	0.0	0.0
Sherman	0	0	0	2	0	2	356	na	na	na
Smith	0	1	0	0	0	1	171	na	na	na
Stafford	0	0	1	0	0	1	244	na	na	na
Stanton	0	0	0	0	0	0	108	0.0	0.0	0.0
Stevens	0	0	1	0	1	2	330	na	na	na
Sumner	1	3	4	4	0	12	1,256	9.6 ‡	4.9	16.7
Thomas	0	0	1	2	0	3	553	na ‡	na	na
Trego	0	0	0	0	0	0	150	0.0	0.0	0.0
Wabaunsee	0	0	2	0	0	2	395	na	na	na
Wallace	0	0	1	0	0	1	114	na	na	na
Washington	1	0	0	1	0	2	365	na	na	na
Wichita	0	0	0	1	0	1	152	na	na	na
Wilson	0	0	1	0	0	1	477	na	na	na
Woodson	0	0	0	0	0	0	147	0.0	0.0	0.0
Wyandotte	13	23	20	20	14	90	12,562	7.2	5.8	8.8
n.a	0	0	0	0	0	0	9			

Table 4
Infant Deaths and Mortality Rates by County of Residence
Peer Group, and Urban-Rural Classification*
Kansas, 2017-2021

County of Residence	Year					Total Infant Deaths	Total Live Births	Rate†	95% Confidence Intervals	
	2017	2018	2019	2020	2021	2017-2021	2017-2021	2017-2021	Lower	Upper
Peer Group										
Frontier	6	9	4	9	6	34	5,977	5.7	3.9	8.0
Rural	16	14	18	11	10	69	13,219	5.2	4.0	6.6
sely -Settled Rura	31	37	33	39	34	174	28,795	6.0	5.1	6.9
Semi-Urban	38	36	25	32	30	161	27,767	5.8	4.9	6.7
Urban	126	135	109	133	104	607	101,425	6.0	5.5	6.5
rban-rural 6-level sification (NCHS)										
Noncore	27	31	26	27	21	132	21,785	6.1	5.0	7.1
Micropolitar	40	38	35	40	37	190	35,552	5.3	4.6	6.1
Small metro	45	34	23	38	28	168	24,766	6.8	5.8	7.8
Medium metro	55	70	45	62	53	285	40,448	7.0	6.2	7.9
Large fringe metro	50	58	60	57	45	270	54,632	4.9	4.4	5.5
leve sification (NCHS)										
Rural	67	69	61	67	58	322	57,337	5.6	5.0	6.2
Urban	150	162	128	157	126	723	119,846	6.0	5.6	6.5

*See Technical Notes for Peer Group and Urban-Rural Classification definitions.

†Rate per 1,000 live births.

‡Rate has a relative standard error greater than 30%, should be used with caution since it doesn't meet the standard of reliability.

n.a. = Rates with an relative standard error greater than 50% have been suppressed.

Residence data

Source: Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment

Table 5
Infant Deaths by Ten Leading Causes of Infant Death by Period of Death
Kansas, 2017-2021

Cause of Death (ICD-10 Code)	Age of Infant						
	Under 1 Day	1-6 Days	Hebdomadal Deaths (under 7 days)	7-27 Days	Neonatal Deaths (Under 28 Days)	Post-Neonatal Deaths (28 Days to 1 Year)	Under 1 Year
All causes	446	122	568	120	688	357	1045
1. Congenital Malformations, Deformations, and Chromosomal Anomalies (Q00-Q99)	104	53	157	31	188	53	241
2. Sudden Unexpected Infant Death (R95, R99, W75)	8	3	11	20	31	186	217
3. Disorders Related to Short Gestation and Low Birth Weight, Not Elsewhere Classified (P07)	158	3	161	2	163	0	163
4. Newborn Affected by Maternal Complications of Pregnancy (P01)	60	4	64	3	67	0	67
5. Newborn Affected by Complications of Placenta, Cord, and Membranes (P02)	35	2	37	1	38	0	38
6. Bacterial Sepsis of Newborn (P36)	2	5	7	7	14	0	14
7. Accidents (Unintentional Injuries) (V01-X59, excluding W75)	0	1	1	1	2	19	21
8. Necrotizing Enterocolitis of Newborn (P77)	0	1	1	7	8	1	9
9. Intrauterine Hypoxia and Birth Asphyxia (P20-P21)	3	3	6	5	11	0	11
10. Neonatal Hemorrhage (P50-P52, P54)	3	8	11	1	12	0	12

Residence data

In the event of a tie, causes are listed in order of ICD-10 code.

Source: Bureau of Epidemiology and Public Health Informatics

Kansas Department of Health and Environment

Table 6
Infant Deaths by County of Residence
and Period of Death, Kansas, 2017-2021

County of Residence	Hebdomadal Deaths (under 7 days)	Neonatal Deaths (Under 28 days)	Post-Neonatal Deaths (28-364 days)	Total Infant Deaths (under 1 year)
Kansas	568	120	357	1045
Allen	3	0	2	5
Anderson	1	0	2	3
Atchison	2	0	2	4
Barber	2	1	0	3
Barton	4	1	3	8
Bourbon	5	1	1	7
Brown	4	0	0	4
Butler	12	1	7	20
Chase	0	0	0	0
Chautauqua	0	0	1	1
Cherokee	6	2	1	9
Cheyenne	0	0	0	0
Clark	0	0	1	1
Clay	0	0	0	0
Cloud	4	1	3	8
Coffey	0	0	0	0
Comanche	0	0	0	0
Cowley	10	1	2	13
Crawford	9	3	3	15
Decatur	0	0	0	0
Dickinson	6	1	4	11
Doniphan	2	0	1	3
Douglas	11	5	13	29
Edwards	0	0	1	1
Elk	0	0	1	1
Ellis	4	1	0	5
Ellsworth	0	0	1	1
Finney	11	1	5	17
Ford	8	4	4	16
Franklin	4	1	3	8
Geary	20	0	7	27
Gove	0	0	0	0
Graham	1	0	1	2
Grant	3	1	0	4
Gray	2	0	0	2
Greeley	0	1	0	1
Greenwood	3	0	1	4
Hamilton	1	0	0	1
Harper	1	0	1	2
Harvey	10	0	7	17
Haskell	0	0	1	1
Hodgeman	0	0	1	1
Jackson	1	2	2	5
Jefferson	3	0	1	4
Jewell	0	0	1	1
Johnson	78	12	48	138
Kearny	1	0	0	1
Kingman	0	0	2	2
Kiowa	0	0	0	0
Labette	2	1	0	3
Lane	0	0	0	0
Leavenworth	14	5	13	32
Lincoln	1	0	0	1
Linn	1	0	2	3
Logan	0	0	0	0

Table 6
Infant Deaths by County of Residence
and Period of Death, Kansas, 2017-2021

County of Residence	Hebdomadal Deaths (under 7 days)	Neonatal Deaths (Under 28 days)	Post-Neonatal Deaths (28-364 days)	Total Infant Deaths (under 1 year)
Lyon	7	1	5	13
McPherson	0	0	2	2
Marion	3	0	1	4
Marshall	2	0	1	3
Meade	3	0	0	3
Miami	3	1	3	7
Mitchell	1	0	0	1
Montgomery	5	0	5	10
Morris	0	0	0	0
Morton	1	0	1	2
Nemaha	0	0	2	2
Neosho	4	0	6	10
Ness	1	0	0	1
Norton	1	0	0	1
Osage	2	2	1	5
Osborne	0	0	0	0
Ottawa	2	2	1	5
Pawnee	1	0	0	1
Phillips	1	0	1	2
Pottawatomie	7	2	3	12
Pratt	2	1	3	6
Rawlins	0	0	0	0
Reno	5	3	6	14
Republic	1	0	1	2
Rice	1	1	1	3
Riley	11	7	6	24
Rooks	0	1	0	1
Rush	0	0	0	0
Russell	0	0	0	0
Saline	15	0	4	19
Scott	0	0	1	1
Sedgwick	123	30	81	234
Seward	4	3	3	10
Shawnee	54	6	24	84
Sheridan	0	0	0	0
Sherman	0	0	2	2
Smith	1	0	0	1
Stafford	1	0	0	1
Stanton	0	0	0	0
Stevens	2	0	0	2
Sumner	7	3	2	12
Thomas	0	1	2	3
Trego	0	0	0	0
Wabaunsee	2	0	0	2
Wallace	0	0	1	1
Washington	1	0	1	2
Wichita	1	0	0	1
Wilson	0	0	1	1
Woodson.	0	0	0	0
Wyandotte	43	10	37	90
Unknown	0	0	0	0

Residence data
Source: Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment

Table 7
Stillbirths by Ten Leading Causes of Fetal Death and Weeks Gestation
Kansas, 2017-2021

(ICD-10 Code)	Stillbirths	20-27	28-31	32-41	42-47
All Causes	933	457	131	342	3
1. Fetal Death of Unspecified Cause (P95)	292	153	38	99	1
2. Fetus Affected by Complications of Placenta, Cord and Membranes (P02)	210	81	30	98	1
3. Fetus Affected by Maternal Conditions That May Be Unrelated to Present Pregnancy (P00)	118	47	20	50	0
4. Fetus Affected by Maternal Complications of Pregnancy (P01)	88	72	8	8	0
5. Congenital Malformations, Deformations and Chromosomal Abnormalities (Q00-Q99)	76	34	12	30	0
6. Syndrome of Infant of a Diabetic Mother and Neonatal Diabetes Mellitus (P70.0-P70.2)	26	5	3	18	0
7. Disorders Related to Short Gestation and Low Birth Weight, Not Elsewhere Classified (P07)	12	10	1	0	0
8. In Situ Neoplasms, Benign Neoplasms and Neoplasms of Uncertain or Unknown Behavior (D00-D48)	12	11	1	0	0
9. Fetus Affected by Noxious Influences Transmitted via Placenta (P04)	13	3	3	7	0
10. Hydrops Fetalis Not Due to Hemolytic Disease (P83.2)	11	7	2	2	0

Residence Data

In the event of a tie, causes are listed in order of ICD-10 code.

Source: Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment

Table 8
Linked Infant Deaths

by Ten Leading Causes of Infant Death and Weeks Gestation

Kansas, 2017-2021

Cause of Death (ICD-10 Code)	Total	Very Premature <32 weeks	Moderate Premature 32-33 weeks	Late Preterm 34-36 weeks	Total Preterm <37 weeks	Early Term 37-38 weeks	Term >=39 weeks	n.s.*
All causes	978	447	37	106	590	177	199	12
1. Congenital Malformations, Deformations, and Chromosomal Anomalies (Q00-Q99)	209	30	18	47	95	69	44	1
2. Sudden Unexpected Infant Death (R95, R99, W75)	213	8	7	23	38	71	104	0
3. Disorders Related to Short Gestation and Low Birth Weight, Not Elsewhere Classified (P07)	160	153	0	0	153	0	0	7
4. Newborn Affected by Maternal Complications of Pregnancy (P01)	65	57	1	2	60	2	1	2
5. Newborn Affected by Complications of Placenta, Cord, and Membranes (P02)	36	27	2	2	31	1	3	1
6. Bacterial Sepsis of Newborn (P36)	11	10	0	1	11	0	0	0
7. Accidents (Unintentional Injuries) (V01-X59, excluding W75)	19	0	0	5	5	6	8	0
8. Necrotizing Enterocolitis of Newborn (P77)	9	7	1	1	9	0	0	0
9. Intrauterine Hypoxia and Birth Asphyxia (P20-P21)	9	6	0	1	7	1	1	0
10. Neonatal Hemorrhage (P50-P52, P54)	11	10	0	0	10	0	1	0

*n.s. = Unknown or not stated. Records with gestation outside of 17-47 weeks were classified as unknown gestation.

Unknowns are excluded in calculating percents.

In the event of a tie, causes are listed in order of ICD-10 code.

Residence data

Source: Bureau of Epidemiology and Public Health Informatics

Kansas Department of Health and Environment

Table 9
Linked Infant Deaths by Birth Characteristics
and Selected Population Groups of the Mother
Kansas, 2017-2021

Characteristics	All races and origins	White NH*	Black NH*	American Indian or Alaska Native NH*	Asian or Pacific Islander NH*	Multi Race NH*	Other NH*	Hispanic	Unknown
Total	978	600	138	3	25	28	7	173	4
Sex									
Female	436	283	53	1	16	9	1	72	1
Male	542	317	85	2	9	19	6	101	3
Plurality									
Single	861	531	110	3	19	26	6	163	3
Twin	110	64	27	-	6	2	1	10	-
Triplets or more	6	5	1	-	-	-	-	-	-
Plural	116	69	28	-	6	2	1	10	-
n.s.	1	-	-	-	-	-	-	-	1
Birth Order									
1	392	238	47	1	10	9	3	82	2
2	246	166	25	-	9	9	1	35	1
3	165	102	29	1	1	2	2	28	-
4	88	47	20	-	4	4	-	13	-
5 or more	86	47	17	1	1	4	1	15	-
n.s.	1	-	-	-	-	-	-	-	1
Birthweight									
Less than 2,500 grams	611	361	99	1	22	16	4	106	2
Less than 500 grams	253	134	58	1	12	4	1	42	1
500-1499 grams	204	125	26	-	8	4	2	38	1
1,500-2,499 grams	154	102	15	-	2	8	1	26	-
2,500 grams or more	362	235	39	2	3	12	3	67	1
n.s.	5	4	-	-	-	-	-	-	1
Gestational Age									
Premature (< 37 weeks)	590	350	99	1	22	12	4	100	2
Very Premature (< 32 wks)	447	254	83	1	20	9	2	76	2
Moderate Premature (32-33 wks)	37	27	2	-	1	1	1	5	-
Late Premature (34-36 wks)	106	69	14	-	1	2	1	19	-
Early Term (37-38 weeks)	177	108	20	1	1	8	1	38	-
Term (39-47 weeks)	199	137	16	1	2	8	1	33	1
n.s.	12	5	3	-	-	-	1	2	1
Mother's Age									
Under 20 years	81	37	9	-	1	4	-	30	-
20-24 years	252	153	31	-	5	7	-	56	-
25-29 years	301	187	56	-	7	10	3	36	2
30-34 years	222	153	25	1	7	4	2	29	1
35-39 years	96	56	15	2	4	3	2	14	-
40-64 years	24	13	2		1	-	-	8	-
n.s.	2	1	-	-	-	-	-	-	1
Marital Status									
Married	446	322	31	2	20	10	4	56	1
Unmarried	530	278	107	1	5	18	3	117	1
n.s.	2	-	-	-	-	-	-	-	2

Table 9
Linked Infant Deaths by Birth Characteristics
and Selected Population Groups of the Mother
Kansas, 2017-2021

Characteristics	All races and origins	White NH*	Black NH*	American Indian or Alaska Native NH*	Asian or Pacific Islander NH*	Multi Race NH*	Other NH*	Hispanic	Unknown
Payor									
Medicaid	427	242	85	2	6	18	1	71	2
Private Insurance	397	296	35	1	12	3	3	47	-
Self Pay	85	24	3	-	3	4	3	48	-
Indian Health Service	-	-	-	-	-	-	-	-	-
Tricare	42	24	11	-	2	2	-	3	-
Other Government	6	2	-	-	2	1	-	1	-
Other	12	9	3	-	-	-	-	-	-
n.s.	9	3	1	-	-	-	-	3	2
Mother's Education*									
8th Grade or Less	31	5	3	-	2	-	1	20	-
9-12 Grade, No Diploma	58	26	12	-	1	1	1	17	-
H.S. or GED	172	102	38	1	4	6	-	20	1
Some College, No Degree	144	83	30	-	5	5	3	18	-
Associate Degree	59	49	5	1	-	2	-	2	-
Bachelor's Degree	104	90	5	1	2	1	-	5	-
Master's Degree	47	32	4	-	4	2	2	3	-
Doctorate	13	11	1	-	-	-	-	1	-
n.s.	15	11	-	-	1	-	-	1	2
*Mothers Over 24 years	643	409	98	3	19	17	7	87	3
Prenatal Care									
None	42	14	11	-	4	2	-	10	1
Month 1	33	21	5	-	2	-	-	5	-
Month 2	348	237	44	1	7	9	3	46	1
Month 3	334	217	47	-	7	10	-	53	-
First Trimester	715	475	96	1	16	19	3	104	1
Month 4	96	48	16	1	3	2	1	24	1
Month 5	42	23	5	-	1	1	1	11	-
Month 6	32	14	5	-	-	-	2	10	1
Second Trimester	170	85	26	1	4	3	4	45	2
Month 7	14	8	1	-	-	2	-	3	-
Month 8	6	3	1	-	-	1	-	1	-
Month 9 & Higher	4	1	-	1	1		-	1	-
Third Trimester	24	12	2	1	1	3	-	5	-
n.s.	27	14	3	-	-	1	-	9	-
Adequecy of Prenatal Care									
Adequate Plus	406	270	51	1	9	8	2	64	1
Adequate	272	179	34	-	7	9	1	41	1
Intermediate	101	55	23	-	2	3	1	17	-
Inadequate	170	78	28	2	7	7	3	43	2
n.s.	29	18	2	-	-	1	-	8	-
Smoking During Pregnancy									
Ever Smoked During Pregnancy	160	122	14	1	2	8	-	13	-
Smoking Status Known	965	592	137	3	25	26	6	173	3

Table 9
Linked Infant Deaths by Birth Characteristics
and Selected Population Groups of the Mother
Kansas, 2017-2021

Characteristics	All races and origins	White NH*	Black NH*	American Indian or Alaska Native NH*	Asian or Pacific Islander NH*	Multi Race NH*	Other NH*	Hispanic	Unknown
Pre-pregnancy BMI									
Underweight	34	24	3	-	-	1	-	5	1
Normal weight	330	219	37	-	9	12	2	50	1
Overweight	239	140	32	-	8	9	3	46	1
Obese	350	206	61	3	6	5	1	68	-
n.s.	25	11	5	-	2	1	1	4	1

* NH = Non-Hispanic, population group includes unknown Hispanic origin.
Residence data
n.s. = not stated
Source: Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment

Table 10
Live Births by Birth Characteristics
and Selected Population Groups of the Mother
Kansas, 2017-2021

Characteristics	All races and origins	White NH*	Black NH*	American Indian or Alaska Native NH*	Asian or Pacific Islander NH*	Multi Race NH*	Other NH*	Hispanic	Unknown
Total	177,192	122,509	12,030	807	5,986	4,314	1,240	30,069	237
Sex									
Female	86,457	59706	5,862	408	2,896	2,138	604	14,711	132
Male	90,733	62803	6,167	399	3,090	2,176	636	15,357	105
n.s.	2	0	1	-		-	-	1	-
Plurality									
Single	171,509	118,461	11,478	789	5,834	4,152	1,201	29,361	233
Twin	5,535	3,941	543	18	152	147	38	694	2
Triplets or more	137	103	9	-	-	12	-	13	-
Plural	5,672	4,044	552	18	152	159	38	707	2
n.s.	11	4	-	-	-	3	1	1	2
Birth Order									
1	62,773	44,183	4,036	259	2,543	1,723	454	9,492	83
2	54,826	39,361	3,292	215	2,059	1,248	383	8,199	69
3	33,105	22,711	2,208	146	837	728	233	6,193	49
4	15,282	9,715	1,276	92	329	332	106	3,417	15
5 or more	11,204	6,538	1,218	95	218	282	64	2,768	21
n.s.	2	1	-	-	-	1	-	-	-
Birthweight									
Less than 2,500 grams	13,157	8,187	1,719	54	510	418	100	2,144	25
Less than 500 grams	307	161	71	1	14	4	2	53	1
500-1499 grams	2,006	1,245	285	15	60	51	13	331	6
1,500-2,499 grams	10,844	6,781	1,363	38	436	363	85	1,760	18
2,500 grams or more	164,011	114,306	10,311	753	5,476	3,895	1,140	27,923	207
n.s.	24	16	-	-	-	1	-	2	5
Gestational Age									
Premature (< 37 weeks)	17,312	11,437	1,687	78	566	484	111	2,921	28
Very Premature (< 32 wks)	2,595	1,607	373	16	81	65	17	430	6
Moderate Premature (32-33 wks)	1,988	1,330	221	4	60	58	12	299	4
Late Premature (34-36 wks)	12,729	8,500	1,093	58	425	361	82	2,192	18
Early Term (37-38 weeks)	47,881	32,091	3,667	264	1,763	1,170	329	8,538	59
Term (≥39 weeks)	111,842	78,897	6,669	464	3,651	2,652	797	18,568	144
n.s.	157	84	7	1	6	8	3	42	6
Mother's Age									
Under 20 years	9,281	4,728	1,044	61	92	470	39	2,842	5
20-24 years	37,752	23,329	3,455	236	555	1,456	214	8,475	32
25-29 years	55,282	39,474	3,556	231	1,651	1,250	352	8,716	52
30-34 years	49,214	36,989	2,504	180	2,246	764	395	6,059	77
35-39 years	21,657	15,485	1,205	81	1,205	324	195	3,107	55
40-64 years	3,997	2,502	266	18	237	49	45	870	10
n.s.	9	2	-	-	-	1	-	-	6
Marital Status									
Married	112,977	86,577	3,757	293	5,187	1,765	1,021	14,218	159
Unmarried	64,153	35,901	8,272	514	799	2,548	219	15,831	69
n.s.	62	31	1	-	-	1	-	20	9
Payor									
Medicaid	54,457	32,142	7,013	427	1,013	2,224	388	11,203	47
Private Insurance	98,519	78,428	3,482	237	4,178	1,555	515	10,017	107
Self Pay	12,158	4,446	471	24	354	122	227	6,485	29
Indian Health Service	121	27	1	64	-	18	-	11	-
Tricare	7,940	5,248	841	31	318	303	46	1,151	2
Other Government	1,142	704	83	9	33	36	15	259	3
Other	1,627	993	94	6	64	32	31	405	2
n.s.	1,228	521	45	9	26	24	18	538	47

Table 10
Live Births by Birth Characteristics
and Selected Population Groups of the Mother
Kansas, 2017-2021

Characteristics	All races and origins	White NH*	Black NH*	American Indian or Alaska Native NH*	Asian or Pacific Islander NH*	Multi Race NH*	Other NH*	Hispanic	Unknown
Mother's Education*									
8th Grade or Less	3,879	866	207	4	246	18	120	2,412	6
9-12 Grade, No Diploma	6,658	2,668	608	51	162	126	86	2,950	7
H.S. or GED	23,671	14,136	2,331	126	724	536	198	5,602	18
Some College, No Degree	23,263	16,458	2,058	139	543	656	111	3,282	16
Associate Degree	13,765	10,769	775	72	312	293	57	1,481	6
Bachelor's Degree	38,075	32,486	959	83	1,654	513	242	2,099	39
Master's Degree	15,631	13,056	425	27	1,217	186	107	598	15
Doctorate	4,566	3,717	104	6	446	56	54	176	7
n.s.	642	294	64	2	35	3	12	152	80
*Mothers Over 24 years	130,150	94,450	7,531	510	5,339	2,387	987	18,752	194
Prenatal Care									
None	1,688	844	243	20	70	46	19	428	18
Month 1	4,333	2,927	291	14	121	82	34	855	9
Month 2	65,445	47,428	3,917	195	2,274	1,363	446	9,773	49
Month 3	72,667	52,940	4,330	305	2,321	1,793	426	10,451	101
First Trimester	142,445	103,295	8,538	514	4,716	3,238	906	21,079	159
Month 4	15,439	9,318	1,400	117	520	463	133	3,469	19
Month 5	6,573	3,481	718	52	287	193	62	1,768	12
Month 6	3,757	1,938	423	42	157	115	40	1,037	5
Second Trimester	25,769	14,737	2,541	211	964	771	235	6,274	36
Month 7	2,641	1,352	285	17	91	101	25	767	3
Month 8	1,898	879	209	17	71	66	22	631	3
Month 9 & Higher	1,006	512	94	11	29	41	11	303	5
Third Trimester	5,545	2,743	588	45	191	208	58	1,701	11
n.s.	1,745	890	120	17	45	51	22	587	13
Adequecy of Prenatal Care									
Adequate Plus	52,586	38,150	3,199	251	1,819	1,324	237	7,537	69
Adequate	93,935	68,276	5,536	304	3,135	2,070	634	13,890	90
Intermediate	9,833	5,363	1,020	61	254	262	151	2,708	14
Inadequate	18,856	9,645	2,156	175	727	608	195	5,300	50
n.s.	1,982	1,075	119	16	51	50	23	634	14
Smoking During Pregnancy									
Ever Smoked During Pregnancy	15,303	12,160	1,251	147	82	648	13	992	10
Smoking Status Known	176,584	122,150	11,971	802	5,974	4,287	1,236	29,956	208
Pre-pregnancy BMI									
Underweight	4,692	3,165	385	15	320	143	46	611	7
Normal weight	69,910	50,818	3,841	234	3,288	1,554	532	9,553	90
Overweight	48,022	32,256	3,174	223	1,585	1,103	397	9,231	53
Obese	53,400	35,729	4,522	326	764	1,478	235	10,292	54
n.s.	1,168	541	108	9	29	36	30	382	33

* NH = Non-Hispanic, population group includes unknown Hispanic origin.
Residence data
n.s. = not stated
Source: Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment

Appendix B

Kansas Department Of Health And Environment
Office of Vital Statistics

CERTIFICATE OF DEATH

State File Number

1. DECEDENT'S LEGAL NAME (First, Middle, Last)	2. SEX	3. IF FEMALE, NAME PRIOR TO FIRST MARRAIGE	4. DATE OF DEATH (Month, Day, Year)

5. SOCIAL SECURITY NUMBER	6. DATE OF BIRTH (Month, Day, Year)	7a. AGE-Last Birthday (Years)	7b. UNDER 1 YEAR		7c. UNDER 1 DAY		8. PLACE OF BIRTH (City and State or Foreign Country)
			Months	Days	Hours	Minutes	

9. WAS DECEDENT EVER IN U.S. ARMED FORCES?	10a. PLACE OF DEATH (Check only one)	
☐ Yes ☐ No ☐ Unknown	HOSPITAL ☐ Inpatient ☐ DOA ☐ ER/Outpatient	☐ Nursing Home ☐ Hospice Facility ☐ Assisted Living Facility ☐ Decedent's Residence ☐ Other (Specify) _____

10b. FACILITY NAME (If not institution, give street and number)	10c. COUNTY OF DEATH	10d. CITY OR TOWN OF DEATH	10e. ZIP CODE

11. MARITAL STATUS	12. SURVIVING SPOUSE (If wife, give name before first marriage)
☐ Married ☐ Married, but separated ☐ Widowed ☐ Divorced ☐ Never Married ☐ Unknown	

13a. RESIDENCE-STREET ADDRESS & APARTMENT NO.	13b. STATE

13c. COUNTY	13d. CITY OR TOWN	13e. ZIP CODE	13f. INSIDE CITY LIMITS?
			☐ Yes ☐ No ☐ Unknown

14. FATHER'S NAME (First, Middle, Last)	15. MOTHER'S NAME PRIOR TO FIRST MARRIAGE (First, Middle, Last)

16a. INFORMANT'S NAME (First, Middle, Last)	16b. MAILING ADDRESS (Street and Number, City, State, Zip Code)	16c. RELATIONSHIP TO DECEDENT

17. METHOD OF DISPOSITION	18a. PLACE OF DISPOSITION (Name of cemetery, crematory, or other place)	18b. LOCATION-City or Town, and State
☐ Burial ☐ Cremation ☐ Removal from State ☐ Donation ☐ Entombment ☐ Other (Specify) _____		

19. FUNERAL SERVICE LICENSEE & LICENSE NO. (Signature) ➢	20. NAME OF EMBALMER & LICENSE NO.

21. NAME AND ADDRESS OF FIRM

22. CAUSE OF DEATH – Part I. Enter the chain of events - diseases, injuries, or complications-that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line. Add additional lines, if necessary.

		Approximate Interval: Onset to Death
IMMEDIATE CAUSE (Final disease or condition resulting in death)	a.	
	DUE TO (OR AS A CONSEQUENCE OF):	
Sequentially list conditions, if any, leading to immediate cause listed on line a. Enter the **UNDERLYING CAUSE** (disease or injury that initiated the events resulting in death) LAST.	b.	
	DUE TO (OR AS A CONSEQUENCE OF):	
	c.	
	DUE TO (OR AS A CONSEQUENCE OF):	
	d.	

PART II. Enter other significant conditions contributing to death, but not resulting in the underlying cause given in Part I.	23a. AUTOPSY	23b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?	23c. WAS CORONER CONTACTED?
	☐ Yes ☐ No ☐ Unknown	☐ Yes ☐ No ☐ Unknown ☐ Not Applicable	☐ Yes ☐ No ☐ Unknown

24. DID TOBACCO USE CONTRIBUTE TO DEATH?	25. IF FEMALE	26. MANNER OF DEATH
☐ Yes ☐ Probably ☐ No ☐ Unknown	☐ Not pregnant within past year ☐ Not pregnant, but pregnant 43 days to 1 year before death ☐ Pregnant at time of death ☐ Unknown if pregnant within the last year ☐ Not pregnant, but pregnant within 42 days of death	☐ Natural ☐ Homicide ☐ Accident ☐ Pending Investigation ☐ Suicide ☐ Could not be determined

27a. DATE OF INJURY (Month, Day, Year)	27b. TIME OF INJURY A.M. P.M.	27c. INJURY AT WORK	27d. DESCRIBE HOW INJURY OCCURRED
		☐ Yes ☐ No	

27e. PLACE OF INJURY-Residence, farm, street, factory, building, etc. (Specify)	27f. LOCATION (Street and Number or Rural Route, City or Town, State, Zip Code)

28a. DATE PRONOUNCED DEAD (Month, Day, Year)	28b. TIME PRONOUNCED DEAD A.M. P.M.	28c. ACTUAL OR PRESUMED TIME OF DEATH A.M. P.M.	28d. NAME OF PERSON PRONOUNCING DEATH (If applicable)	28e. LICENSE NO.

29a. **CERTIFIER** (Check only one)

☐ Certifying physician - To the best of my knowledge, death occurred due to the cause(s) and manner stated.
☐ Pronouncing & Certifying physician - To the best of my knowledge, death occurred at the time, date, and place, and due to the cause(s) and manner stated.
☐ Coroner - On the basis of examination, and/or investigation, in my opinion, death occurred at the time, date, and place, and due to the cause(s) and manner stated.

Signature of certifier ➢ LICENSE NO. DATE CERTIFIER SIGNED

29b. NAME, ADDRESS, AND ZIP CODE OF PERSON COMPLETING CAUSE OF DEATH ☐ M.D. ☐ D.O.	30. DATE FILED BY STATE REGISTRAR (Month, Day, Year)

31. ANCESTRY-What is this person's ancestry or ethnic origin? Italian, German, Dominican, Vietnamese, Hmong, French Canadian, etc. (Specify below)

32. HISPANIC ORIGIN (Check the box or boxes that best describes whether the decedent is Spanish/Hispanic/Latino. Check the "no" box if the decedent is not Spanish/Hispanic/Latino)

- ☐ No, not Spanish/Hispanic/Latino
- ☐ Yes, Mexican/Mexican American/Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, Central American
- ☐ Yes, South American
- ☐ Yes, other Spanish/Hispanic/Latino (Specify)

_____

- ☐ Unknown

33. RACE (Check one or more boxes to indicate what race(s) the decedent considered himself or herself to be.)

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native (Name of the enrolled or principaltribes)

_____

_____

- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Other Asian (Specify)

_____

_____

- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander (Specify)

_____

_____

- ☐ Other (Specify)

_____

_____

- ☐ Unknown

34. EDUCATION (Check the box that best describes the highest degree or level of school completed at the time of death.)

- ☐ 8th grade or less
- ☐ 9th - 12th grade; no diploma
- ☐ High school graduate or GED
- ☐ Some College credit, but no degree
- ☐ Associate degree (e.g., AA, AS)
- ☐ Bachelor's degree (e.g., BA, AB, BS)
- ☐ Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA)
- ☐ Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)
- ☐ Unknown

35. DECEDENT'S USUAL OCCUPATION (Give kind of work done during most of working life. Do not use retired.)

36. KIND OF BUSINESS/INDUSTRY (Do not give name of company.)

Kansas Department of Health and Environment
Office of Vital Statistics

CERTIFICATE OF LIVE BIRTH

115-

State File Number

1. CHILD'S NAME (First, Middle, Last, Suffix)	2. DATE OF BIRTH (Month, Day, Year)	3. TIME OF BIRTH M

4. SEX	5. BIRTH WEIGHT (Grams)	6. C TY, TOWN, C LOCATION OF BIRTH	7. COUNTY OF BIRTH

8. PLACE OF BIRTH ☐ Hospital ☐ Freestanding Birthing Center ☐ Home Birth ☐ Clinic/Doctor's Office ☐ Other (Specify) _____	9. FACILITY NAME (If not institution, give street and number)

10. I CERTIFY THAT THE STATED INFORMATION CONCERNING THIS CHILD IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF. Certifier's Signature ➢ _____	11. DATE SIGNED (Month, Day, Year)	12. ATTENDANT'S NAME AND TITLE (Type) Name _____ ☐ M.D. ☐ D.O. ☐ C.N.M. ☐ Other Midwife ☐ Other (Specify) _____

13. Certifier's Name and Title (Type) Name _____ ☐ M.D. ☐ D.O. ☐ Hosp Adm. ☐ C.N.M. ☐ Other Midwife ☐ Other (Specify) _____	14. ATTENDANT'S MAILING ADDRESS (Street and Number or Rural Route, City, or Town, State, Zip Code)

15. MOTHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)	16. MOTHER'S LAST NAME PRIOR TO FIRST MARRIAGE

17. DATE OF BIRTH (Month, Day, Year)	18. BIRTHPLACE (State, Territory, or Foreign Country)	19. PRESENT RESIDENCE-STATE

20. COUNTY	21. CITY, TOWN, OR LOCATION	22. STREET AND NUMBER OF PRESENT RESIDENCE

23. ZIP CODE	24. INSIDE CITY LIMITS? ☐ YES ☐ NO	25. MOTHER'S MAILING ADDRESS (If same as residence, leave blank)

26. FATHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)	27. DATE OF BIRTH (Month, Day, Year)	28. BIRTHPLACE (State, Territory, or Foreign Country)

29. PARENTS REQUEST SOCIAL SECURITY NUMBER ISSUANCE? ☐ YES ☐ NO	30. IMMUNIZATION REGISTRY I wish to enroll my child in the Immunization Registry ☐ YES ☐ NO

31. I CERTIFY THAT THE PERSONAL INFORMATION PROVIDED ON THE CERTIFICATE IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. Signature of Parent (or Other Informant) ➢ _____	32. DATE SIGNED (Month, Day, Year)	33 DATE FILED BY STATE REGISTRAR (Month, Day, Year) (Vital Statistics only)

34. IF HOME BIRTH, WAS DELIVERY PLANNED AT HOME? ☐ Yes ☐ No ☐ Unknown

35. MOTHER'S SOCIAL SECURITY NUMBER

36. FATHER'S SOCIAL SECURITY NUMBER

37a. WAS MOTHER EVER MARRIED? ☐ Yes ☐ No ☐ Unknown

37b. MOTHER MARRIED? (At birth, conception or any time between) ☐ Yes ☐ No ☐ Unknown

37c. IF NO, HAS PATERNITY ACKNOWLEDGMENT BEEN SIGNED? ☐ Yes ☐ No

37d. MOTHER REFUSES TO GIVE HUSBAND'S INFORMATION ☐ Yes ☐ No

38. WHAT IS THE PRIMARY LANGUAGE SPOKEN IN THE HOME? ☐ English ☐ Spanish ☐ Vietnamese ☐ German ☐ French ☐ Russian ☐ Ukrainian ☐ Mandarin ☐ Cantonese ☐ Sign Language ☐ Other *(Specify)* _____

39. PARENT'S HISPANIC ORIGIN (Check the box or boxes that best describes whether the parent is Spanish, Hispanic, or Latino. Check the "No" box if the parent is not Spanish, Hispanic, or Latino.)

39a. MOTHER
- ☐ No, not Spanish/ Hispanic/Latina
- ☐ Yes, Mexican/Mexican American/Chicana
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, Central American
- ☐ Yes, South American
- ☐ Yes, other Spanish/ Hispanic/Latina (Specify)_____
- ☐ Unknown

39b. FATHER
- ☐ No, not Spanish/ Hispanic/Latino
- ☐ Yes, Mexican/Mexican American/Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, Central American
- ☐ Yes, South American
- ☐ Yes, other Spanish/ Hispanic/Latino (Specify)_____
- ☐ Unknown

40. PARENT'S RACE (Check one or more races to indicate what you consider yourself to be.)

40a. MOTHER
- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native (Name of the enrolled or principal tribes) _____
- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Other Asian (Specify) _____
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander (Specify) _____
- ☐ Other (Specify) _____
- ☐ Unknown

40b. FATHER
- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native (Name of the enrolled or principal tribes) _____
- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Other Asian (Specify)
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander (Specify) _____
- ☐ Other (Specify) _____
- ☐ Unknown

41. ANCESTRY - What is the parents' ancestry or ethnic origin?- Italian, German, Dominican, Vietnamese, Hmong, French Canadian, etc. (Specify below)

41a. MOTHER

41b. FATHER

42. OCCUPATION AND BUSINESS/INDUSTRY

	Occupation	Business/Industry (Do not give name of company.)
42a. MOTHER (Most recent)		42c. MOTHER
42b. FATHER (Usual)		42d. FATHER

43. EDUCATION (Check the box that best describes the highest degree or level of school completed at the time of delivery.)

43a. MOTHER'S EDUCATION ☐ 8th grade or less ☐ 9th - 12th grade; no diploma ☐ High school graduate or GED ☐ Some College credit, but no degree ☐ Associate degree (e.g., AA,AS) ☐ Bachelor's degree (e.g., BA, AB, BS) ☐ Unknown ☐ Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA) ☐ Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)

43b. FATHER'S EDUCATION ☐ 8th grade or less ☐ 9th - 12th grade; no diploma ☐ High school graduate or GED ☐ Some College credit, but no degree ☐ Associate degree (e.g., AA,AS) ☐ Bachelor's degree (e.g., BA, AB, BS) ☐ Unknown ☐ Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA) ☐ Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)

44. PREVIOUS LIVE BIRTHS (Do not include this child.)

44a. Now living Number _____ ☐ None

44b. Now dead Number _____ ☐ None

45. NUMBER OF OTHER OUTCOMES (Spontaneous or induced losses or ectopic or stillbirth pregnancies)

45a. Before 20 weeks Number _____ ☐ None

45b. 20 weeks & over Number _____ ☐ None

44c. DATE OF LAST LIVE BIRTH (Month, Year)

45c. DATE OF LAST OTHER PREGNANCY OUTCOME (Month, Year)

46. PRENATAL CARE? ☐ Yes ☐ No

47. DATE OF FIRST PRENATAL CARE VISIT (Month, Day, Year)

48. DATE OF LAST PRENATAL CARE VISIT (Month, Day, Year)

49. PRENATAL VISITS-Total Number (If none, enter "0")

50. DATE LAST NORMAL MENSES BEGAN (Month, Day, Year)

51. OBSTETRIC ESTIMATE OF GESTATION (Completed Weeks)

52. PLURALITY-Single, Twin, Triplet, etc. (Specify)

53. IF NOT A SINGLE BIRTH – Born First, Second, Third, etc. (Specify)

54. TOTAL LIVE BIRTHS AT THIS DELIVERY

55. IS INFANT ALIVE AT THE TIME OF THIS REPORT? ☐ Yes ☐ No ☐ Unknown

56. IS INFANT BEING BREAST-FED AT DISCHARGE? ☐ Yes ☐ No ☐ Unknown

57. CIGARETTE SMOKING BEFORE & DURING PREGNANCY: Did mother smoke 3 mos. before or during pregnancy? ☐ Yes ☐ No ☐ Unknown

For each time period, enter either the number of cigarettes or the number of packs of cigarettes smoked **per day** during each time period. If none, enter "0".

Average number of cigarettes or packs of cigarettes **smoked per day** for each period:

	No.	No.
Three months before pregnancy:	_____ cigarettes or	_____ packs
First three months of pregnancy:	_____ cigarettes or	_____ packs
Second three months of pregnancy:	_____ cigarettes or	_____ packs
Third Trimester of pregnancy:	_____ cigarettes or	_____ packs

58. PRINCIPAL SOURCE OF PAYMENT FOR THIS DELIVERY
- ☐ Medicaid ☐ Private/Employer Ins. ☐ Self-pay
- ☐ Indian Health Service ☐ CHAMPUS/TRICARE ☐ Other government
- ☐ Other (Specify)_____ ☐ Unknown

59. MOTHER'S MEDICAL RECORD NO.

60. NEWBORN'S MEDICAL RECORD NO.

61. MOTHER TRANSFERRED IN FOR DELIVERY DUE TO MATERNAL, MEDICAL, OR FETAL INDICATIONS? ☐ Yes ☐ No (If yes, enter facility name)

FACILITY TRANSFERRED FROM:

62. INFANT TRANSFERRED (Within 24 hours of delivery) ☐ Yes ☐ No (If yes, enter facility name)

FACILITY TRANSFERRED TO:

CHILD'S NAME MOTHER'S NAME

PRENATAL (Birth)

63. NUTRITION OF MOTHER

1. Height _____
2. Prepregnancy Weight _____
3. Weight at delivery _____
4. Did mother get WIC food for herself?
   Yes_____ No_____
   Unknown _____

64. MEDICAL RISK FACTORS (Check all that apply.)

1. ☐ Diabetes, prepregnancy
2. ☐ Diabetes, gestational
3. Hypertension
   - ☐ Prepregnancy (Chronic)
   - ☐ Gestational (PIH, preeclampsia)
   - ☐ Eclampsia
4. ☐ Previous preterm birth
5. ☐ Other previous poor pregnancy outcome (SGA, perinatal death, etc.)
6. ☐ Vaginal bleeding during this pregnancy prior to labor
7. ☐ Pregnancy resulted from infertility treatment (If yes, check all that apply.)
   - ☐ Fertility-enhancing drugs, Artificial insemination or Intrauterine insemination
   - ☐ Assisted reproductive technology (e.g. in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT))
8. ☐ Mother had a previous cesarean delivery, if yes, how many? Number: _____
9. ☐ Alcohol use
   No. of drinks per week: _____
10. ☐ None of the above

65. METHOD OF DELIVERY

1. Forceps attempted? Yes_____No_____
   Successful Yes_____No_____
2. Vacuum extraction attempted?
   Yes_____No_____
   Successful Yes_____No _____
3. Fetal presentation at delivery
   - ☐ Cephalic
   - ☐ Breech
   - ☐ Other
4. Final route and method of delivery (check one)
   - ☐ Vaginal/spontaneous
   - ☐ Vaginal/forceps
   - ☐ Vaginal/vacuum
   - ☐ Cesarean, if cesarean was a trial of labor attempted? Yes_____No_____

LABOR-DELIVERY/NEWBORN

66. OBSTETRICAL PROCEDURES (Check all that apply.)

1. ☐ Cervical cerclage
2. ☐ Tocolysis
3. External cephalic version:
   - ☐ Successful
   - ☐ Failed
4. ☐ None of the above

67. ONSET OF LABOR (Check all that apply.)

1. ☐ Premature Rupture of the Membranes (prolonged, ≥ 12 hours)
2. ☐ Precipitous Labor (< 3 hrs)
3. ☐ Prolonged Labor (≥ 20 hrs)
4. ☐ None of the above

68. CHARACTERISTICS OF LABOR AND DELIVERY (Check all that apply.)

1. ☐ Induction of labor
2. ☐ Augmentation of labor
3. ☐ Non-vertex presentation
4. ☐ Steroids (glucocorticoids) for fetal lung maturation received by the mother prior to delivery
5. ☐ Antibiotics received by the mother during labor
6. ☐ Clinical chorioamnionitis diagnosed during labor or maternal temperature ≥ 38 C (100.4 F)
7. ☐ Moderate/heavy meconium staining of the amniotic fluid
8. ☐ Fetal intolerance of labor: (examples: in-utero resuscitative measures, further fetal assessment, or operative delivery)
9. ☐ Epidural or spinal anesthesia during labor
10. ☐ None of the above

69. MATERNAL MORBIDITY
(Check all that apply.)
(These are complications associated with labor and delivery.)

1. ☐ Maternal transfusion
2. ☐ Third or fourth degree perineal laceration
3. ☐ Ruptured uterus
4. ☐ Unplanned hysterectomy
5. ☐ Admission to intensive care unit
6. ☐ Unplanned operating room procedure following delivery
7. ☐ None of the above

70. INFECTIONS PRESENT AND/OR TREATED
(During this pregnancy, check all that apply.)

1. ☐ Gonorrhea
2. ☐ Syphilis
3. ☐ Herpes Simplex Virus (HSV)
4. ☐ Chlamydia
5. ☐ Hepatitis B
6. ☐ Hepatitis C
7. ☐ AIDS or HIV antibody
8. ☐ None of the above

71. ABNORMAL CONDITIONS OF NEWBORN (Check all that apply)

1. ☐ Assisted ventilation required immediately following delivery
2. ☐ Assisted ventilation required for more than six hours
3. ☐ NICU admission
4. ☐ Newborn given surfactant replacement therapy
5. ☐ Antibiotics received by the newborn for suspected neonatal sepsis
6. ☐ Seizure or serious neurologic dysfunction
7. ☐ Significant birth injury (skeletal fracture(s), peripheral nerve injury, and/or soft tissue/solid organ hemorrhage which requires intervention
8. ☐ None of the above

72. VACCINES ADMINISTERED TO NEWBORN

1. ☐ Hepatitis B Date Given: _____
2. ☐ Other* Specify: _____
   Date Given: _____

73. APGAR SCORE

1 min	5 min	10 min

74. CONGENITAL ANOMALIES OF THE NEWBORN (Check all that apply.)

1. ☐ Anencephaly
2. ☐ Meningomyelocele/Spina bifida
3. ☐ Cyanotic congenital heart disease
4. ☐ Congenital diaphragmatic hernia
5. ☐ Omphalocele
6. ☐ Gastroschisis
7. ☐ Limb reduction defect (excluding congenital amputation and dwarfing syndromes)
8. ☐ Cleft Lip with or without Cleft Palate
9. ☐ Cleft Palate alone
10. ☐ Down Syndrome
    - ☐ Karyotype confirmed
    - ☐ Karyotype pending
11. ☐ Suspected chromosomal disorder
    - ☐ Karyotype confirmed
    - ☐ Karyotype pending
12. ☐ Hypospadias
13. ☐ Fetal alcohol syndrome
14. ☐ Other congenital anomalies *(Specify)* _____
15. ☐ None of the above

Parent's Telephone Number: _____

CHILD'S NAME_____ MOTHER'S NAME _____

Test required by K.S.A. 65-153f 153G Serological Test Made: _____ 1st_____2nd_____3rd (Trimester) _____ At Delivery_____Not Performed If no test made, state reason:	Test required by K.S.A. 65-180 Infant Neonatal Screening specimen taken: _____ Yes_____No Kit Number _____ If no test made, state reason:	Test required by K.S.A. 65-1157A Newborn Hearing Screening Accomplished: _____ Yes_____No

Infant's patient number:

Infant's Primary Care Physician

First	Middle	Last	Title (MD, DO, etc.)

If screening accomplished,
Date hearing screened _____/_____/_____
Month Day Year

The results of the hearing screening ✓:
Right ear:_____Pass _____Refer for further testing
Left ear:_____Pass _____Refer for further testing

Physiologic equipment used ✓:_____OAE _____AABR _____ABR

If screening not accomplished, ✓ one reason:

_____ b – missed appointment
_____ c – could not test
_____ d – deceased
_____ i – Incomplete test
_____ m – Infant discharged before screening
_____ n – transferred to NICU
_____o – other
_____r – did not consent
_____s – scheduled but not completed
_____t – transferred to another hospital
_____u – no information
_____x – invalid results

Kansas Department of Health and Environment
Office of Vital Statistics

CERTIFICATE OF STILLBIRTH (FETAL DEATH)

State File Number

1. NAME (First, Middle, Last, Suffix)		2. DATE OF DELIVERY (Month, Day, Year)	3. TIME OF DELIVERY M
4. SEX	5. CITY, TOWN, OR LOCATION OF DELIVERY	6. COUNTY OF DELIVERY	

7. PLACE OF DELIVERY	8. FACILITY NAME (If not institution, give street and number and zip code)
☐ Hospital ☐ Freestanding Birthing Center ☐ Home Delivery ☐ Clinic/Doctor's Office ☐ Other (Specify) _____	

9. MOTHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)	10. MOTHER'S LAST NAME PRIOR TO FIRST MARRIAGE

11. DATE OF BIRTH (Month, Day, Year)	12. BIRTHPLACE (State, Territory, or Foreign Country)	13. PRESENT RESIDENCE-STATE

14. COUNTY	15. CITY, TOWN, OR LOCATION	16. STREET AND NUMBER OF PRESENT RESIDENCE

17. ZIPCODE	18. INSIDE CITY LIMITS? ☐ Yes ☐ No	19. MOTHER'S MAILING ADDRESS (If same as residence, leave blank)

20. FATHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)	21. DATE OF BIRTH (Month, Day, Year)	22. BIRTHPLACE (State, Territory, or Foreign Country)

23. I CERTIFY THAT THE PERSONAL INFORMATION PROVIDED ON THE CERTIFICATE IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. Signature of Parent (or Other Informant) ➢	24. DATE SIGNED (Month, Day, Year)

25. CAUSE/CONDITIONS CONTRIBUTING TO FETAL DEATH

25a. INITIATING CAUSE/CONDITION (Among the choices below, please select the one which most likely began the sequence of events resulting in the death of the fetus.)

Maternal Conditions/Diseases (Specify) _____

Complications of Placenta, Cord, or Membranes – ☐ Rupture of membranes prior to onset of labor ☐ Abruptio placenta ☐ Placental insufficiency ☐ Prolapsed cord ☐ Chorioamnionitis ☐ Other (Specify) _____

Other Obstetrical or Pregnancy Complications (Specify) _____

Fetal Injury (Specify) _____

Other Fetal Conditions/Disorders (Specify) _____

Fetal Anomaly (Specify) _____

Fetal Infection (Specify) _____

☐ Unknown

25b. OTHER SIGNIFICANT CAUSES OR CONDITIONS (Select or specify all other conditions contributing to death in item 25a.)

Maternal Conditions/Diseases (Specify) _____

Complications of Placenta, Cord, or Membranes – ☐ Rupture of membranes prior to onset of labor ☐ Abruptio placenta ☐ Placental insufficiency ☐ Prolapsed cord ☐ Chorioamnionitis ☐ Other (Specify) _____

Other Obstetrical or Pregnancy Complications (Specify) _____

Fetal Injury (Specify) _____

Other Fetal Conditions/Disorders (Specify) _____

Fetal Anomaly (Specify) _____

Fetal Infection (Specify) _____

☐ Unknown

26. ESTIMATED TIME OF FETAL DEATH	27a. WAS AN AUTOPSY PERFORMED?	27b. WAS A HISTOLOGICAL PLACENTAL EXAMINATION PERFORMED?
☐ Dead at time of first assessment, no labor ongoing ☐ Dead at time of first assessment, labor ongoing ☐ Died during labor, after first assessment ☐ Unknown time of fetal death	☐ Yes ☐ No ☐ Planned	☐ Yes ☐ No ☐ Planned
	27c. WERE AUTOPSY OR HISTOLOGICAL PLACENTAL EXAMINATION RESULTS USED IN DETERMINING THE CAUSE OF FETAL DEATH? ☐ Yes ☐ No	

28. I CERTIFY THAT THIS DELIVERY OCCURRED ON THE DATE STATED ABOVE AND THE FETUS WAS BORN DEAD. Signature ➢	29. DATE SIGNED (Month, Day, Year)	30. ATTENDANT'S NAME AND TITLE (If delivery not attended by physician) Name (Type) _____ ☐ CNM/CM ☐ Other Midwife ☐ Other (Specify) _____

31. CERTIFIER'S NAME AND TITLE (Type) ☐ M.D. ☐ D.O. ☐ Other (Specify) _____	32. CERTIFIER'S MAILING ADDRESS (Street and Number or Rural Route, City or Town, State, Zip Code)	33a. METHOD OF DISPOSITION ☐ Burial ☐ Cremation ☐ Donation ☐ Hospital Disposition ☐ Removal from State ☐ Other (Specify) _____

33b. PLACE OF DISPOSITION (Name of cemetery, crematory, or other place)	33c. LOCATION (City or Town, and State)

34. FUNERAL DIRECTOR OR HOSPITAL ADMINISTRATOR Signature ➢	35. FIRM OR HOSPITAL NAME AND ADDRESS	36. DATE FILED BY STATE REGISTRAR (Month, Day, Year)

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37. IF HOME DELIVERY, WAS DELIVERY PLANNED AT HOME? ☐ Yes ☐ No ☐ Unknown

38. MOTHER'S MEDICAL RECORD NO.

39a. WAS MOTHER EVER MARRIED? ☐ Yes ☐ No ☐ Unknown

39b. MOTHER MARRIED? (At birth, conception or any time between) ☐ Yes ☐ No ☐ Unknown

40. PARENT'S HISPANIC ORIGIN (Check the box or boxes that best describes whether the parent is Spanish, Hispanic, or Latino. Check the "no" box if the parent is not Spanish, Hispanic, or Latino.)

40a. MOTHER-
- ☐ No, not Spanish/ Hispanic/Latina
- ☐ Yes, Mexican/Mexican American/Chicana
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, Central American
- ☐ Yes, South American
- ☐ Yes, other Spanish/ Hispanic/Latina (Specify) _____
- ☐ Unknown

40b. FATHER-
- ☐ No, not Spanish/ Hispanic/Latino
- ☐ Yes, Mexican/Mexican American/Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, Central American
- ☐ Yes, South American
- ☐ Yes, other Spanish/ Hispanic/Latino (Specify) _____
- ☐ Unknown

41. PARENT'S RACE (Check one or more races to indicate what you consider yourself to be.)

41a. MOTHER		41b. FATHER	
☐ White	☐ Native Hawaiian	☐ White	☐ Native Hawaiian
☐ Black or African American	☐ Guamanian or Chamorro	☐ Black or African American	☐ Guamanian or Chamorro
☐ American Indian or Alaska Native (Name of the enrolled or principal tribes) _____ _____	☐ Samoan ☐ Other Pacific Islander (Specify) _____ _____	☐ American Indian or Alaska Native (Name of the enrolled or principal tribes) _____ _____	☐ Samoan ☐ Other Pacific Islander (Specify) _____ _____
☐ Asian Indian	☐ Other (Specify) _____ _____	☐ Asian Indian	☐ Other (Specify) _____ _____
☐ Chinese		☐ Chinese	
☐ Filipino		☐ Filipino	
☐ Japanese		☐ Japanese	
☐ Korean	☐ Unknown	☐ Korean	☐ Unknown
☐ Vietnamese		☐ Vietnamese	
☐ Other Asian (Specify) _____		☐ Other Asian (Specify) _____	

42. ANCESTRY - What is the parents' ancestry or ethnic origin?- Italian, German, Dominican, Vietnamese, Hmong, French Canadian, etc. (Specify below)

43. OCCUPATION AND BUSINESS/INDUSTRY

	Occupation	Business/Industry (Do not give name of company.)
42a. MOTHER	43a. MOTHER (Most recent)	43c. MOTHER
42b. FATHER	43b. FATHER (Usual)	43d. FATHER

44. EDUCATION (Check the box that best describes the highest degree or level of school completed at the time of delivery.)

44a. MOTHER'S EDUCATION
☐ 8th grade or less ☐ 9th - 12th grade, no diploma ☐ High school graduate or GED
☐ Some College credit, but no degree ☐ Associate degree (e.g., AA,AS) ☐ Bachelor's degree (e.g., BA, AB, BS)
☐ Unknown ☐ Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA) ☐ Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)

44a. FATHER'S EDUCATION
☐ 8th grade or less ☑ 9th - 12th grade, no diploma ☐ High school graduate or GED
☐ Some College credit, but no degree ☐ Associate degree (e.g., AA,AS) ☐ Bachelor's degree (e.g., BA, AB, BS)
☐ Unknown ☐ Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA) ☐ Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)

45. PREVIOUS LIVE BIRTHS (Do not include this child.)
- 45a. Now living Number _____ ☐ None
- 45b. Now dead Number _____ ☐ None

46. NUMBER OF OTHER OUTCOMES (Spontaneous or induced losses or ectopic or stillbirth pregnancies)
- 46a. Before 20 weeks Number _____ ☐ None
- 46b. 20 weeks & over Number _____ ☐ None

47. PLURALITY – Single, Twin, Triplet, etc. (Specify)

48. IF NOT A SINGLE BIRTH – Born First, Second, Third, etc. (Specify)

49. DATE LAST NORMAL MENSES BEGAN (Month, Day, Year)

50. OBSTETRIC ESTIMATE OF GESTATION (Completed Weeks)

45c. DATE OF LAST LIVE BIRTH (Month, Year)

46c. DATE OF LAST OTHER PREGNANCY OUTCOME (Month, Year)

51. WEIGHT OF FETUS (grams)

52. PRENATAL CARE? ☐ Yes ☐ No

53. DATE OF FIRST PRENATAL CARE VISIT (Month, Day, Year)

54. DATE OF LAST PRENATAL CARE VISIT (Month, Day, Year)

55. PRENATAL VISIT – Total number (If none, enter "0")

56. CIGARETTE SMOKING BEFORE & DURING PREGNANCY: Did mother smoke 3 mos. before or during pregnancy?
☐ Yes ☐ No ☐ Unknown

For each time period, enter either the number of cigarettes or the number of packs of cigarettes **smoked per day**. If none, enter "0".

Average number of cigarettes or packs of cigarettes smoked **per day**:

	No.	No.
Three months before pregnancy:	_____ cigarettes or	_____ packs
First three months of pregnancy:	_____ cigarettes or	_____ packs
Second three months of pregnancy:	_____ cigarettes or	_____ packs
Third Trimester of pregnancy:	_____ cigarettes or	_____ packs

57. PRINCIPAL SOURCE OF PAYMENT FOR THIS DELIVERY
- ☐ Medicaid ☐ Private/Employer Ins. ☐ Self-pay
- ☐ Indian Health Service ☐ CHAMPUS/TRICARE ☐ Other government
- ☐ Other ☐ Unknown

58a. MOTHER TRANSFERRED IN FOR DELIVERY DUE TO MATERNAL, MEDICAL, OR FETAL INDICATIONS?
☐ Yes ☐ No (If yes, enter facility name)

58b. FACILITY TRANSFERRED FROM:

PRENATAL	LABOR-DELIVERY/STILLBORN FETUS

59. NUTRITION OF MOTHER

1. Height _____
2. Prepregnancy Weight _____
3. Weight at delivery _____
4. Did mother get WIC food for herself?

   Yes_____No_____Unknown _____

60. MEDICAL RISK FACTORS (Check all that apply.)

1. ☐ Diabetes, prepregnancy
2. ☐ Diabetes, gestational
3. Hypertension
   - ☐ Prepregnancy (Chronic)
   - ☐ Gestational (PIH, preeclampsia)
   - ☐ Eclampsia
4. ☐ Previous preterm birth
5. ☐ Other previous poor pregnancy outcome (SGA, perinatal death, etc.)
6. ☐ Vaginal bleeding during this pregnancy prior to labor
7. ☐ Pregnancy resulted from infertility treatment (If yes, check all that apply.)
   - ☐ Fertility-enhancing drugs, Artificial insemination or Intrauterine insemination
   - ☐ Assisted reproductive technology (e.g. in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT))
8. ☐ Mother had a previous cesarean delivery, if yes, how many Number ____
9. ☐ Alcohol use No. of drinks per week: _____
10. ☐ None of the above

61. METHOD OF DELIVERY

1. Forceps attempted? Yes_____No_____
   Successful: Yes_____No_____
2. Vacuum extraction attempted?
   Yes_____No_____
   Successful: Yes_____No _____
3. Fetal presentation at delivery
   - ☐ Cephalic
   - ☐ Breech
   - ☐ Other
4. Final route and method of delivery (check one)
   - ☐ Vaginal/spontaneous
   - ☐ Vaginal/forceps
   - ☐ Vaginal/vacuum
   - ☐ Cesarean, if cesarean was a trial of labor attempted? Yes_____No_____
5. Hysterotomy/Hysterectomy
   Yes_____No _____

62. MATERNAL MORBIDITY (Check all that apply.)
(These are complications associated with labor and delivery.)

1. ☐ Maternal transfusion
2. ☐ Third or fourth degree perineal laceration
3. ☐ Ruptured uterus
4. ☐ Unplanned hysterectomy
5. ☐ Admission to intensive care unit
6. ☐ Unplanned operating room procedure following delivery
7. ☐ None of the above

63. INFECTIONS PRESENT AND/OR TREATED (During this pregnancy, check all that apply.)

1. ☐ Gonorrhea
2. ☐ Syphilis
3. ☐ Herpes Simplex Virus (HSV)
4. ☐ Chlamydia
5. ☐ Listeria
6. ☐ Group B Streptococcus
7. ☐ Cytomeglovirus
8. ☐ Parvo virus
9. ☐ Toxoplasmosis
10. ☐ AIDS or HIV antibody
11. ☐ None of the above
12. ☐ Other (Specify) _____

64. CONGENITAL ANOMALIES OF THE NEWBORN (Check all that apply.)

1. ☐ Anencephaly
2. ☐ Meningomyelocele/Spina bifida
3. ☐ Cyanotic congenital heart disease
4. ☐ Congenital diaphragmatic hernia
5. ☐ Omphalocele
6. ☐ Gastroschisis
7. ☐ Limb reduction defect (excluding congenital amputation and dwarfing syndromes)
8. ☐ Cleft Lip with or without Cleft Palate
9. ☐ Cleft Palate alone
10. ☐ Down Syndrome
    - ☐ Karyotype confirmed
    - ☐ Karyotype pending
11. ☐ Suspected chromosomal disorder
    - ☐ Karyotype confirmed
    - ☐ Karyotype pending
12. ☐ Hypospadias
13. ☐ Fetal alcohol syndrome
14. ☐ Other congenital anomalies *(Specify)* _____
15. ☐ None of the above

THIS IS NOT PART OF THE CERTIFICATE OF STILLBIRTH
Test required by K.S.A. 65-153F, 153G

Serological Test Made:_____1st_____2nd_____3rd (Trimester)_____At Delivery_____Not Performed

If no test made, state reason: _____