Maternal and Infant Mortality Report

Report to the Florida Legislature
December 1, 2024

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Executive Summary

For Florida Medicaid, ensuring the health of its enrolled infants and mothers is paramount to promoting optimal outcomes and providing the best possible starts in life, putting children on a pathway to independence and prosperity. To help the state strive toward its goals of giving every child the best chance at success, the Agency for Health Care Administration (Agency) has prepared the following report on maternal and infant mortality for Medicaid recipients as directed by the 2024 Florida Legislature.

By analyzing data from Calendar Years (CYs) 2018 to 2021, this report can inform the development of new policies and programs that can save lives and improve health outcomes for some of the state's most vulnerable populations. During the period evaluated, Florida Medicaid recorded the deaths of 353 mothers out of 307,993 and 1,117 infants out of 355,338 live births. In addition to the causes of mortality for mothers, the report includes data on diagnosed co-morbidities such as infections and mental health conditions, although these did not always contribute to the cause of death, which was often not medically related (i.e., accidental).

To obtain the required information, the Agency partnered with the Florida Medical Schools Quality Network (FMSQN) to design the research questions, execute the data queries, and contribute to the summaries. When performing these tasks, FMSQN used the OneFlorida+ Data Trust as the data source, which included Medicaid encounter and claims data, Florida birth certificates, Florida death certificates, and Florida Healthy Start data. The data included live births covered by Florida Medicaid from CYs 2018 to 2021, with data from CYs 2017 to 2022 analyzed to capture events occurring up to one year before the earliest birth and one year after the latest birth.

Through this process, the report aims to inform policy and programs that seek to improve maternal and infant health outcomes across Florida.

Age and Population Demographics

Maternal Mortality

Maternal mortality was observed across all age groups, ranging from women under 20 years to those over 40 years (Table 1). Women aged 20–29 years had the highest number and proportion of maternal deaths. However, mortality rates were relatively higher among older age groups. Specifically, women aged 30–39 years accounted for 33% of deliveries but represented 41% of maternal deaths. Women over 40 years, though comprising only 2% of deliveries, accounted for 6% of maternal deaths. Advanced maternal age is associated with increased risks of fetal chromosomal abnormalities and pregnancy complications, including preeclampsia, gestational diabetes, and placental issues.

Table 1. Florida Medicaid Maternal Mortality by Age in CYs 2018 to 2021.

Maternal Age at Delivery	Deliveries N (%)	All-Cause Mortality (0-365 days) N (%)
Overall (n, row %)	348,743 (100%)	353 (0.10%)
<20 years	25,914 (7.43%)	24 (6.79%)
20-29 years	200,766 (57.56%)	163 (46.17%)
30-39 years	113,410 (32.51%)	146 (41.35%)
40+ years	8,653 (2.48%)	20 (5.66%)

In CYs 2018 to 2021, maternal mortality in Florida Medicaid varied by race and ethnicity (Table 2). White women accounted for 60.5% of deliveries and 63.2% of maternal deaths, while Black women represented 33.7% of deliveries and 32.9% of maternal deaths. The close alignment between delivery percentages and maternal mortality percentages among racial groups indicates that racial disparities are not a significant factor in Florida Medicaid maternal mortality, as it is in other states in the U.S. By ethnicity, non-Hispanic women had a higher proportion of maternal deaths (80.7%), despite comprising 65.7% of deliveries, while Hispanic women, who represented 33.3% of deliveries, accounted for 17.6% of maternal deaths.

Table 2. Florida Medicaid Maternal Mortality by Race and Ethnicity in CYs 2018 to 2021.

Maternal Race	Deliveries N (%)	All-Cause Mortality (0-365 days) N (%)
White	210,990 (60.50%)	223 (63.17%)
Black	117,691 (33.74%)	116 (32.86%)
American Indian/Alaska Native	503 (0.14%)	0 (0%)
Asian	4,722 (1.35%)	3 (0.84%)
Native Hawaiian/Pacific Islander	401 (0.11%)	0 (0%)
Missing/Other	14,436 (4.13%)	11 (3.11%)
Maternal Ethnicity	**Deliveries N (%)**	**All-Cause Mortality (0-365 days) N (%)**
Non-Hispanic	229,292 (65.74%)	285 (80.73%)
Hispanic	116,242 (33.33%)	62 (17.56%)
Missing	3,209 (0.92%)	6 (1.69%)

Maternal mortality in Florida Medicaid differed by geography during CYs 2018 and 2021, with the highest number of deliveries and maternal deaths occurring in highly populated metropolitan areas

(Table 3). However, the relative risk of maternal death by geography in Florida Medicaid did not show significant disparities between metropolitan and nonmetropolitan areas.

Table 3. Florida Medicaid Maternal Mortality by Geography in CYs 2018 to 2021.

Maternal Residential Location	Deliveries N (%)	All-Cause Mortality (0-365 days) N (%)
Metro - Counties in metro areas of 1 million population or more	214,586 (61.53%)	218 (61.75%)
Metro - Counties in metro areas of 250,000 to 1 million population	104,496 (29.96%)	101 (28.61%)
Metro - Counties in metro areas of fewer than 250,000 population	14,320 (4.10%)	14 (3.96%)
Nonmetro - Urban population of 20,000 or more, adjacent to a metro area	7,293 (2.09%)	8 (2.26%)
Nonmetro - Urban population of 5,000 to 20,000, adjacent to a metro area	4,843 (1.38%)	7 (1.98%)
Nonmetro - Urban population of fewer than 5,000, adjacent to a metro area	3,044 (0.87%)	5 (1.41%)
Nonmetro - Urban population of fewer than 5,000, not adjacent to a metro area	139 (0.03%)	0 (0%)
Missing	22 (<1%)	0 (0%)

Infant Mortality

Between 2018 and 2021, 99.68% of infants covered by Florida Medicaid survived to one year of age. Of the 1,117 infants who died, 280 (25%) occurred during the neonatal period (days 0-28), while 837 (75%) were classified as late infant deaths (days 29-365).

Infant mortality risk patterns varied by maternal age, with higher late infant mortality among younger mothers and higher neonatal deaths in older mothers (Table 4).

Table 4. Infant Deaths by Maternal Age in Florida Medicaid, CYs 2018-2021. Deliveries are the percentage of live births by age category. A total percentage might not add up to exactly 100% because of rounding.

Maternal Age (years)	Deliveries	Neonatal Deaths	Late Infant Deaths
<20	7.43%	5.10%	11.63%
20-29	57.56%	51.45%	58.27%
30-39	32.51%	40.87%	27.33%
40+	2.48%	2.55%	2.75%
Total	99.98%	99.97%	99.98%

During CYs 2018 to 2021, infant mortality rates differed by race. Although a greater absolute number of white infants died in both the neonatal and late infant periods (n=542), black infants experienced higher mortality rates (n=503) relative to their population size (Table 5).

Table 5 Infant Deaths by Race in Florida Medicaid, CYs 2018-2021. Deliveries are the percentage of live births by race. A total percentage might not add up to exactly 100% because of rounding.

Maternal Race	Deliveries	Neonatal Deaths	Late Infant Deaths
White	60.50%	46.71%	49.64%
Black	33.74%	45.98%	45.20%
American Indian/Alaska Native	0.14%	0.00%	0.11%
Asian	1.35%	1.82%	1.31%
Native Hawaiian/Pacific Islander	0.11%	0.36%	0.11%
Missing/Other	4.13%	5.10%	3.59%
Total	99.97%	99.97%	99.96%

Although Hispanic infants made up 33.4% of deliveries, they accounted for only 21.9% of neonatal deaths and 20.4% of late infant deaths (Table 6). In contrast, non-Hispanic infants, while comprising 65.7% of deliveries, experienced a disproportionately higher percentage of both neonatal deaths (77%) and late infant deaths (79%).

Table 6 Infant Deaths by Ethnicity in Florida Medicaid, CYs 2018-2021. Deliveries are the percentage of live births by ethnicity. A total percentage might not add up to exactly 100% because of rounding.

Maternal Ethnicity	Deliveries	Neonatal Deaths	Late Infant Deaths
Non-Hispanic	65.70%	77.00%	79.01%
Hispanic	33.37%	21.89%	20.38%
Missing	0.92%	1.09%	0.59%
Total	99.99%	99.98%	99.98%

Infant mortality rates within Florida Medicaid displayed modest geographic variation. Consistent with patterns observed in maternal mortality, most infant deaths (both neonatal and late infant) occurred in highly populated metropolitan areas (Table 7). In smaller metropolitan areas (250,000 to 1 million population), neonatal and late infant deaths were proportionally higher relative to the delivery rate, indicating a slightly elevated mortality risk in these areas. Nonmetropolitan regions had comparatively fewer deliveries and infant deaths, with no neonatal or late infant deaths reported in the smallest and most remote nonmetro areas (populations under 5,000 and not adjacent to metro areas), likely reflecting lower birth rates and smaller population sizes in these locations.

Table 7. Florida Medicaid Maternal Mortality by Geography in CYs 2018 to 2021.

Maternal Residential Location	Deliveries N (%)	Neonatal Deaths (Days 0-28) N (%)	Late Infant Deaths (Days 29-365) N (%)
Metro - Counties in metro areas of 1 million population or more	214,586 (61.53%)	151 (55.10%)	464 (55.63%)
Metro - Counties in metro areas of 250,000 to 1 million population	104,496 (29.96%)	94 (34.30%)	271 (32.49%)
Metro - Counties in metro areas of fewer than 250,000 population	14,320 (4.10%)	15 (5.47%)	48 (5.75%)
Nonmetro - Urban population of 20,000 or more, adjacent to a metro area	7,293 (2.09%)	7 (2.55%)	22 (2.63%)
Nonmetro - Urban population of 5,000 to 20,000, adjacent to a metro area	4,843 (1.38%)	6 (2.18%)	13 (1.55%)
Nonmetro - Urban population of fewer than 5,000, adjacent to a metro area	3,044 (0.87%)	1 (0.36%)	16 (1.91%)
Nonmetro - Urban population of fewer than 5,000, not adjacent to a metro area	139 (0.03%)	0 (0%)	0 (0.00%)
Missing	22 (<1%)	0 (0%)	0 (0%)

Health Care Utilization Patterns

Causes of Maternal Death

The FMSQN analysis of maternal deaths in calendar years 2018 through 2021 found 32% of cases lacking written cause of death on the death certificate (Table 10). Among identified causes, accidents or injuries accounted for 22% of deaths. Examples of accidents or injuries included assault by firearm and motor vehicle accidents. Cardiovascular causes occurred in 12% of deaths. Examples of cardiovascular causes included hypertensive disorders of pregnancy, cardiomyopathy, and thromboembolism. Infections caused death in 11% and included coronavirus infectious disease 2019 (COVID-19) as well as bacterial sepsis. Mental illness or substance use disorders directly caused deaths in 4% of cases, including suicides and narcotic overdoses. Cancer accounted for 3%, while respiratory and gastrointestinal causes contributed to 2%, each respectively.

Of the 353 deaths that occurred among mothers receiving Florida Medicaid services, 41% of their causes of death were not identified.

Table 10. Causes of Maternal Death in Florida Medicaid, CYs 2018-2021. Percent of cases by cause.

Category	Percentage
Accident or Injury (e.g., Motor Vehicle)	22%
Cardiovascular	12%
Infection	11%
Suicide/Drug Overdose	4%
Cancer	3%
Gastrointestinal	2%
Respiratory	2%
Endocrine	1%
Hematologic	1%
Neurologic	1%
Autoimmune	<1%
Placental Abruption	<1%
Not Available/Unspecified	41%

Prenatal Care

The FMSQN identified associations between certain diagnoses in the prenatal period and the percentages of deliveries among Medicaid-covered individuals (Table 8). The FMSQN did not formally test the identified associations for causation regarding mortality. Health care encounters for chronic hypertension, gestational hypertension, and preeclampsia each demonstrated a notable prevalence in deliveries (8.22%, 7.37%, and 7.65%, respectively), highlighting the risks associated with hypertensive disorders in pregnancy. This finding supports the recently inaugurated Pregnancy-Related Optimal Management of Hypertension (PROMPT) initiative of the Florida Perinatal Quality Collaborative, funded by the Florida Department of Health and the University of South Florida. Additional patient-centered outcomes research in Florida is needed to strengthen prevention, early detection, and treatment of hypertensive disorders of pregnancy.

Table 8. Prenatal Conditions and Maternal Mortality in Florida Medicaid, CYs 2018-2021.

Prenatal Conditions	Deliveries
Chronic Hypertension (Day -365 to -140)	2.99%
Superimposed preeclampsia	0.86%
Gestational hypertension (Day -140 to -1)	7.28%
Preeclampsia	4.57%
Multiple Pregnancies[1]	1.81%
Kidney disease (Day -365 to -1)	0.97%
Pregestational diabetes (T1 and T2)	2.28%
Autoimmune conditions (Day -365 to -1)	0.31%
Depression (Day -365 to -1)	11.59%
Anxiety (Day -365 to -1)	7.82%
Substance Use Disorder	4.29%

Postpartum

The FMSQN also analyzed associations postpartum diagnoses and deliveries. The FMSQN did not evaluate these diagnoses for causal correlation with maternal mortality. Postpartum depression and anxiety were prevalent, affecting 11.20% and 8.21% of deliveries, respectively, underscoring the need to continue mental health support throughout the postpartum period (Table 9). Substance use disorder in the postpartum period, although affecting a smaller portion of deliveries (4%), demonstrates the need for interventions targeting substance use in postpartum care.

Table 9. Postpartum Diagnoses and Maternal Mortality in Florida Medicaid, CYs 2018-2021.

Postpartum Diagnosis	Deliveries
Depression	11.20%
Anxiety	8.21%
Substance Use Disorder	4.00%
Sepsis	0.53%
Stroke	0.16%
Cardiomyopathy	0.12%
Chronic hypertension	4.30%
Type 2 Diabetes	1.23%

Causes of Infant Death

The FMSQN analysis of infant deaths in calendar years 2018 through 2021 found 4% of neonatal cases and 42% of late infant cases lacking written cause of death on the death certificate (Table 11). In the neonatal period (days 0-28), approximately half of cases were due to preterm birth, followed by chromosome or genetic abnormality in 24%, and cardiovascular abnormalities in 8%. In the late infant

[1] This category indicates pregnancies involving multiples where one or more died prior to birth.

period of days 29-365, 19% were due to unspecified causes, 7% because of chromosome or genetic abnormalities, 7% cardiovascular malformations, 7% infectious diseases, and 5% due to accident or injury.

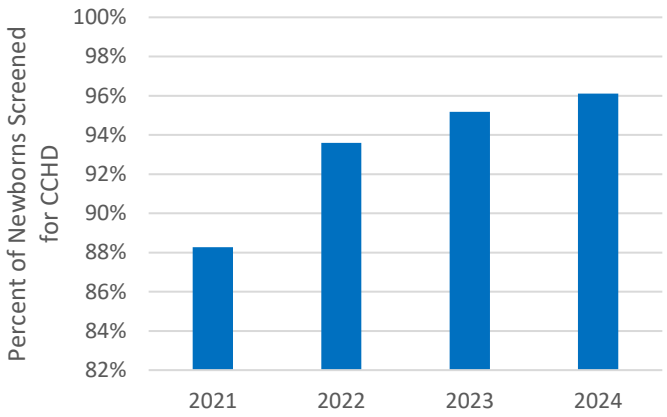
Table 11. Causes of Infant Death in Florida Medicaid, CYs 2018-2021. Percent of cases by cause in the neonatal and late infant period.

	Neonatal Period (Days 0-28)	Late Infant Period (Days 29-365)
Preterm Birth	47%	3%
Chromosome or Genetic	24%	7%
Cardiovascular	8%	7%
Not Available	4%	42%
Unspecified	4%	19%
Infection	4%	7%
Placental Abruption	4%	< 1%
Respiratory	2%	3%
Accident or Injury	1%	5%
Low Birth Weight	1%	0%
Multiple Pregnancy	1%	0%
Cancer	0%	1%
Gastrointestinal	0%	1%
Neurologic	< 1%	1%
Urologic	0%	1%
Endocrine	0%	< 1%
Hematologic	0%	< 1%
Immunodeficiency	0%	< 1%
Mental Illness or Substance Use Disorder	0%	< 1%

Infant Health Care Utilization

Among 355,338 live births, 38,239 (11%) newborns were admitted to a neonatal intensive care unit (NICU). Approximately 50% of the newborns admitted to the NICU had birth weights less than 2,500 grams (5.5 pounds). Typically, a healthy full-term baby weighs between 2,500 and 4,000 grams (5.5 to 8.8 pounds).

Figure 4. Percent of Florida Newborns Screened for Critical Congenital Heart Defects (CCHD). Data source: Florida Department of Health report to Agency for Health Care Administration, October 30, 2024.



Notably, a high proportion of late infant deaths (88%) are categorized as due to "ill-defined or unknown causes," suggesting diagnostic challenges or undetermined factors. Genetic or metabolic causes and neurological issues also had noteworthy, though somewhat lower, contributions to both neonatal and late infant mortality.

Prenatal and Post-Natal Services

Florida Medicaid covers prenatal services, including regular health check-ups to monitor the health of the mother and baby, screening for conditions such as gestational diabetes, hypertension, mental health assessments to identify depression, and sexually transmitted infections such syphilis, human immunodeficiency virus (HIV), and hepatitis B virus (HBV). Additional services may involve ultrasound examinations to assess fetal development, genetic testing, and vaccinations to protect against certain infections. Prenatal care also includes education on pregnancy, labor, breastfeeding, and newborn care, helping to prepare Florida mothers for delivery and early parenthood. In CYs 2018 to 2021, 68% of Florida Medicaid mothers used prenatal services. Of those who did not use prenatal services, most (60%) were aged 20-29 years old, White, non-Hispanic, living in highly populated metropolitan areas, and had lower than average prevalence of chronic conditions. This lack of prenatal service utilization may be driven by financial concerns, work obligations, lack of social support, childcare responsibilities, and other competing priorities that make regular prenatal care seem less feasible, even in densely populated metropolitan areas.

Postnatal services, starting immediately after childbirth, focus on monitoring the recovery of the mother and the health of the newborn. These services include regular check-ups for physical and emotional well-being, breastfeeding support, vaccination schedules for the infant, and screening for postpartum conditions such as depression, bleeding, and infection. Between 2018 and 2021, 61% of Florida Medicaid mothers attended a postpartum visit within seven to 84 days after delivery. The mothers who missed their postpartum visit shared similar demographic and case characteristics with those who did not use prenatal services. This pattern suggests that one-third of Florida Medicaid mothers were consistently challenged in accessing both prenatal and postpartum care.

Breastfeeding is a critical component of maternal and infant health. In Florida, 86% of mothers initiated breastfeeding at delivery; however, by six months postpartum, only 18.2% continued exclusive breastfeeding (Florida Health Charts, Florida Department of Health, 2022). Although postpartum care visits typically include assessments of breast health and breastfeeding practices, there are opportunities within Florida Medicaid to enhance support for breastfeeding. Florida Medicaid covers breast pumps. Additional opportunities to support breastfeeding may include the integration of lactation consultants certified by the International Board of Lactation Consultant Examiners (IBLCE) and the ability of lactation consultants to directly bill for lactation support services.

The Florida Agency for Health Care Administration is committed to supporting new mothers and their infants, setting them on a path toward health and prosperity. Reflecting Florida's pro-life stance, Medicaid provides comprehensive coverage for mothers from the time of pregnancy through 12 months postpartum, ensuring access to critical health care services. Florida's Statewide Medicaid Managed Care enrollees also receive assistance with food, housing, and transportation, which promotes health, stability, and well-being. Together, these initiatives underscore Florida Medicaid's dedication to protecting life, empowering families, and fostering positive outcomes for Florida families.

Appendix A. Limitations

The reported data uses a 1-year lookback and a 1-year follow-up for deliveries, CY2017-2022. The data sources include Florida Medicaid claims, Florida Birth Certificates, and Florida Death Certificates. For this report, the deliveries must have been identified in both Florida Medicaid claims data and Birth Certificate records to ensure coverage by Medicaid. The delivery date in Medicaid claims must not have differed by more than 30 days from the Birth Certificate to minimize data inconsistencies. The infants must have been live-born from the mothers. Inherently, the reported data is limited by the availability of the data in the datasets noting the highest cause of maternal mortality is unknown.