# VHHA Maternal Health Data Overview

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# Agenda

- Maternal Health Data & Measures

- Maternal health disparities

- Barriers to data collection

- The role of Social Determinants of Health (SDoH)

- Severe Maternal Morbidity (SMM) trends

# Hospital Maternal Health Data Source

- VHHA gathers, processes, and disseminates patient-level information from its member hospitals, encompassing inpatient data, emergency department statistics, and a limited amount of outpatient data.

- The majority of the maternal health analyses and resources offered by VHHA derive from the inpatient database.

- VHHA leverages the inpatient data to calculate supplementary metrics, including readmission rates, AHRQ measures, and geo-spatial analytics.

- VHHA provides dashboards and analytics to its member organizations via its platform, VHHAAnalytics.com and is limited in who it can share its data with.

# Hospital Maternal Health Data Measures
*Frequently tracked by VHHA*

- **Cesarean Section Rate** – Percentage of in-hospital births via C-section.

- **Severe Maternal Morbidity (SMM) Rate** – Percentage of deliveries with an SMM-related ICD-10 diagnosis or procedure code.

- **Total In-Hospital Births** – Overall delivery volume across Virginia hospitals.

- **Demographic Stratifications** – Births categorized by payer, race, age, and other key factors.

- **Social Determinants of Health (SDOH) Codes** – ICD-10 "Z-codes" related to economic and social factors impacting maternal health (though usage remains low).

- **AHRQ Maternal Health Measures:**
  - NQI 3 – Neonatal bloodstream infection rate
  - PSI 17 – Birth trauma rate (newborn injuries during delivery).
  - PSI 18 & 19 – Obstetric trauma rates for vaginal deliveries with and without instrumentation.
  - IQI 21 – Vaginal birth after C-section (VBAC rate).
  - IQI 22 – Uncomplicated C-section rate (monitoring potentially avoidable C-sections).

# Hospital Maternal Health Data Sources

*at the patient level in Virginia*

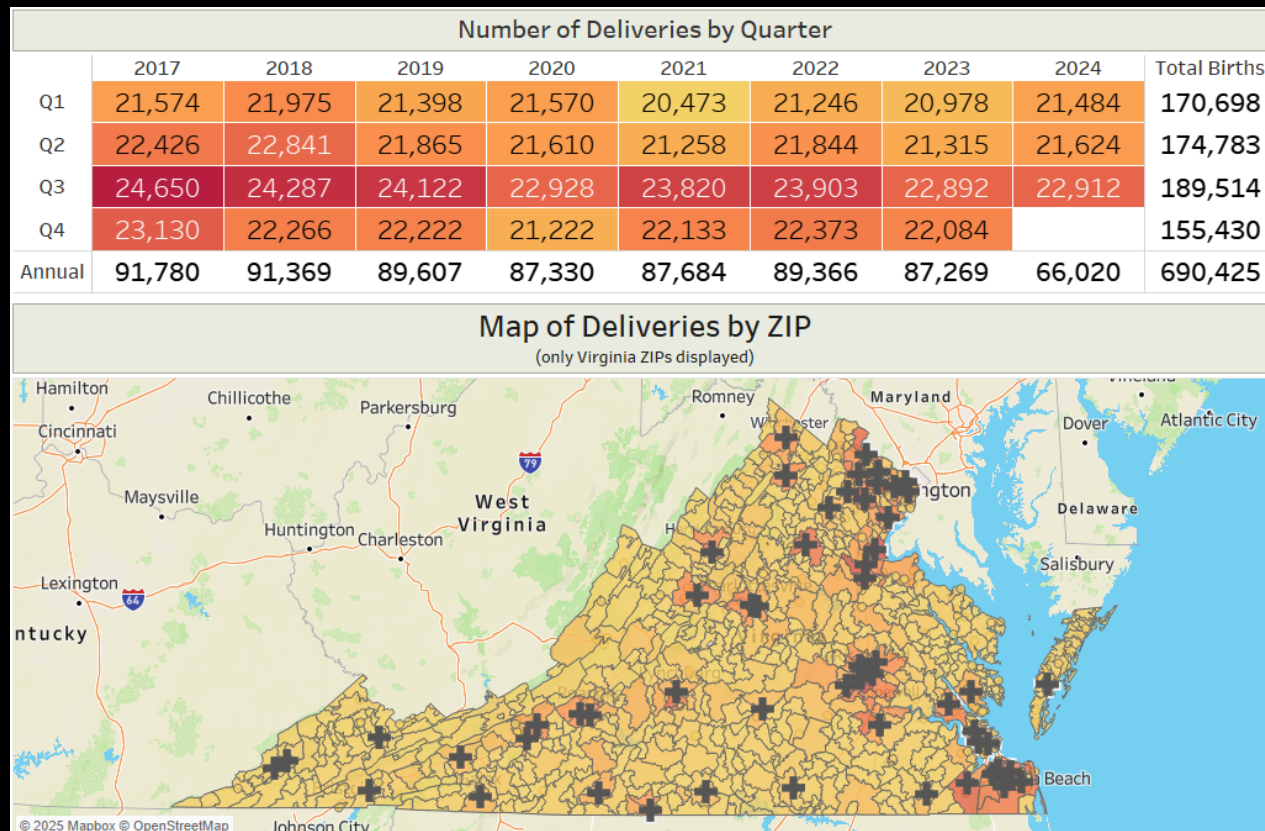| Data Source Name | Data Type | VHHA | VHI | VDH |
|---|---|---|---|---|
| Patient Level Data (Inpatient) | Hospital Admin Data (UB-04) | ✓ | ✓ | ✓ |
| Patient Level Data (Emergency Department) | Hospital Admin Data (UB-04) | ✓ | ✗ | ✗ |
| Patient Level Data (Outpatient) | Hospital Admin Data (UB-04) | ✗ | ✗ | ✗ |
| All Payer's Claim Database (APCD) | Insurance Claims | ✗ | ✓ | ✓ |
| ADT Data (EDCC/Smartchart) | Realtime Hospital Admissions | ✗ | ✓ | ✗ |

# Barriers to Maternal Health Data Collection

*Include but are not limited to:*

- True maternal health mortality rates are hard to measure since a sizable percentage of deaths occur post-discharge.

- Virginia does not have a comprehensive outpatient patient level database, this makes it hard to measure prenatal and postpartum care outcomes.

- Data sharing restrictions: patient privacy and security guardrails can limit data sharing between hospitals, public health agencies, and researchers.

- Many rural areas in Virginia lack obstetric care facilities, leading to potential underreporting of complications that occur outside traditional healthcare settings.
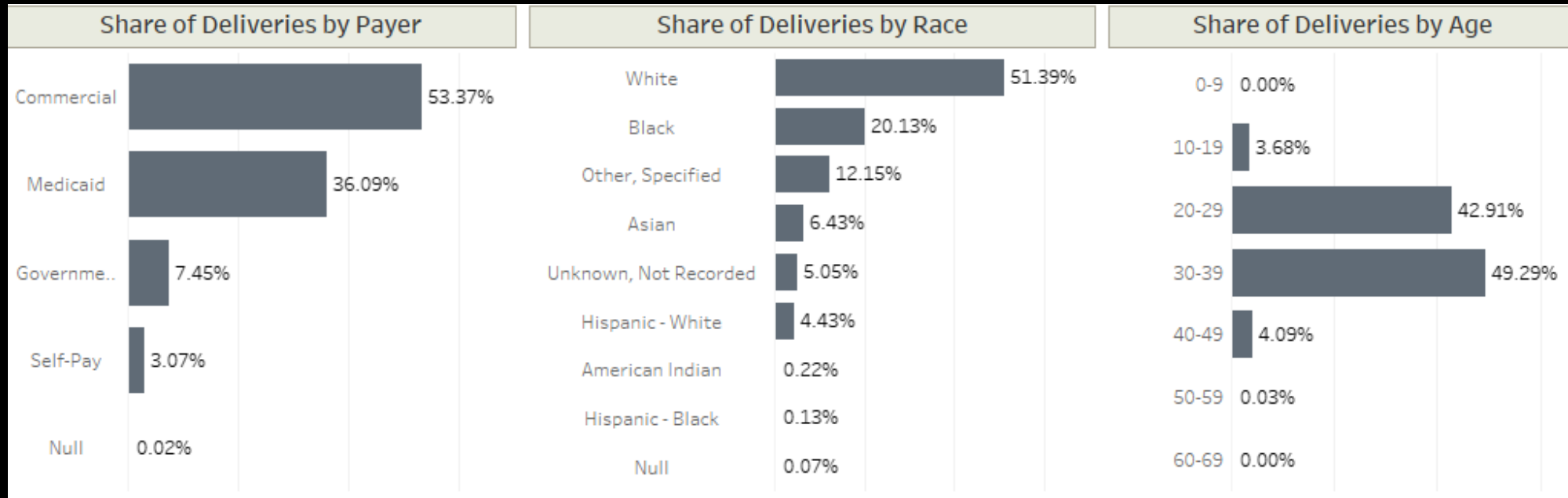
# In-Hospital Delivery Trends

### Number of Deliveries by Quarter

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Total Births |
|---|---|---|---|---|---|---|---|---|---|
| Q1 | 21,574 | 21,975 | 21,398 | 21,570 | 20,473 | 21,246 | 20,978 | 21,484 | 170,698 |
| Q2 | 22,426 | 22,841 | 21,865 | 21,610 | 21,258 | 21,844 | 21,315 | 21,624 | 174,783 |
| Q3 | 24,650 | 24,287 | 24,122 | 22,928 | 23,820 | 23,903 | 22,892 | 22,912 | 189,514 |
| Q4 | 23,130 | 22,266 | 22,222 | 21,222 | 22,133 | 22,373 | 22,084 | | 155,430 |
| Annual | 91,780 | 91,369 | 89,607 | 87,330 | 87,684 | 89,366 | 87,269 | 66,020 | 690,425 |

### Map of Deliveries by ZIP
(only Virginia ZIPs displayed)



© 2025 Mapbox © OpenStreetMap

**Key Insights:**

- **Total Births (2017-2024)**: *690,425 deliveries* recorded across Virginia hospitals.
- **Annual Trends**:
  - <u>Deliveries peaked in 2017-2019</u> but have declined slightly in recent years.
  - Seasonal fluctuations are evident, with <u>Q3 typically having the highest birth rates each year</u>.

- **Densely Populated Regions**:
  - Higher concentration of births in Northern Virginia, Richmond, and Hampton Roads, reflecting major urban centers.

- **Maternal Care Access Concerns**:
  - <u>Western</u> and <u>Southwest</u> Virginia have lower delivery counts, highlighting potential maternity care deserts.
  - Black crosses on the map indicate hospitals.
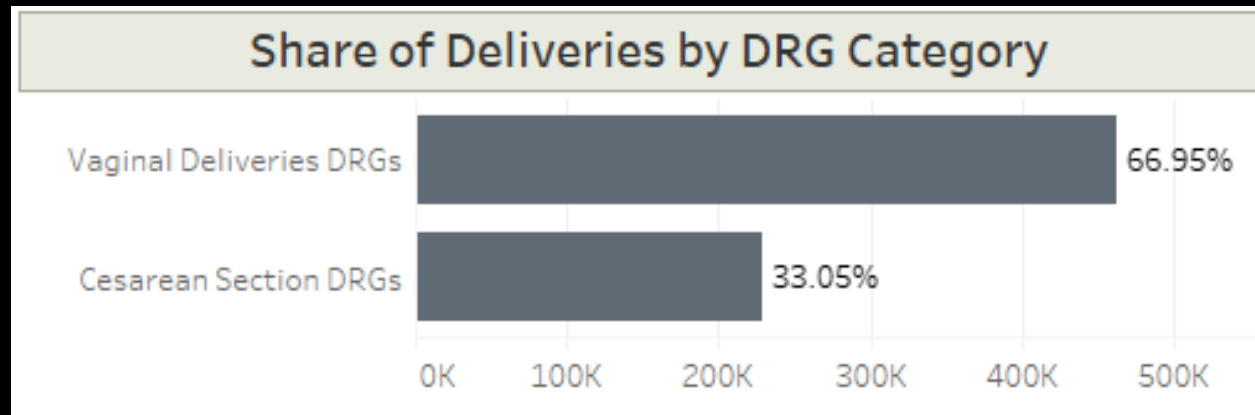
# Patient Demographics



- Commercial insurance (53.37%) remains the largest payer, while Medicaid (36.09%) continues to cover a significant portion of deliveries.
- Self-pay (3.07%) and government programs (7.45%) highlight populations that may have higher financial and healthcare access barriers.
- White mothers (51.39%) account for the majority of deliveries, followed by Black mothers (20.13%) and Other/Multiracial (12.15%).
- Most deliveries (92%) occur between ages 20-39, with 30-39 (49.29%) as the dominant group.
- Teen pregnancies (3.68%) remain low, but older maternal age (40+) brings higher clinical risks.

# Age Trends

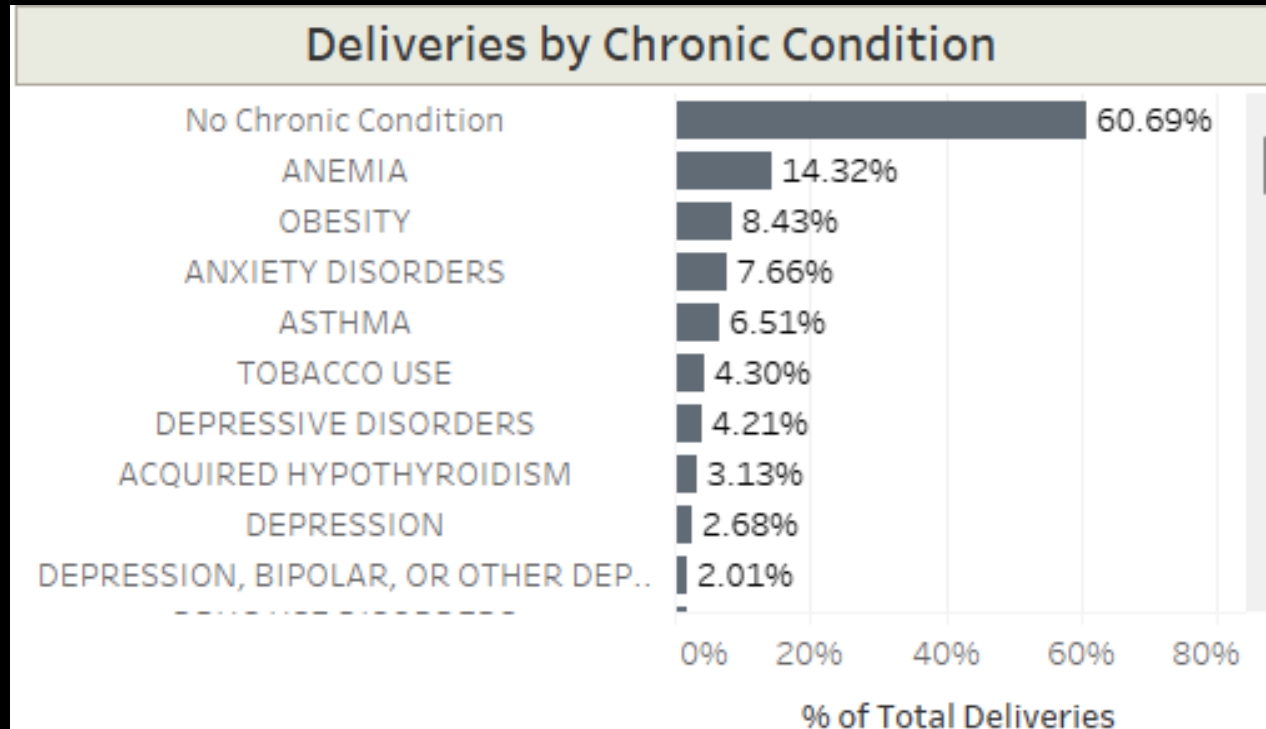| Avg. Delivery Age by Year | |
|---|---|
| 2017 | 29.68 |
| 2018 | 29.68 |
| 2019 | 29.62 |
| 2020 | 29.50 |
| 2021 | 29.92 |
| 2022 | 30.37 |
| 2023 | 30.64 |
| 2024 | 30.84 |
| Grand Total | 30.10 |

- The average maternal age at delivery has steadily increased from 29.68 years in 2017 to 30.84 years in 2024.

- Since 2021, the average has surpassed 30 years, reflecting national trends of delayed childbirth

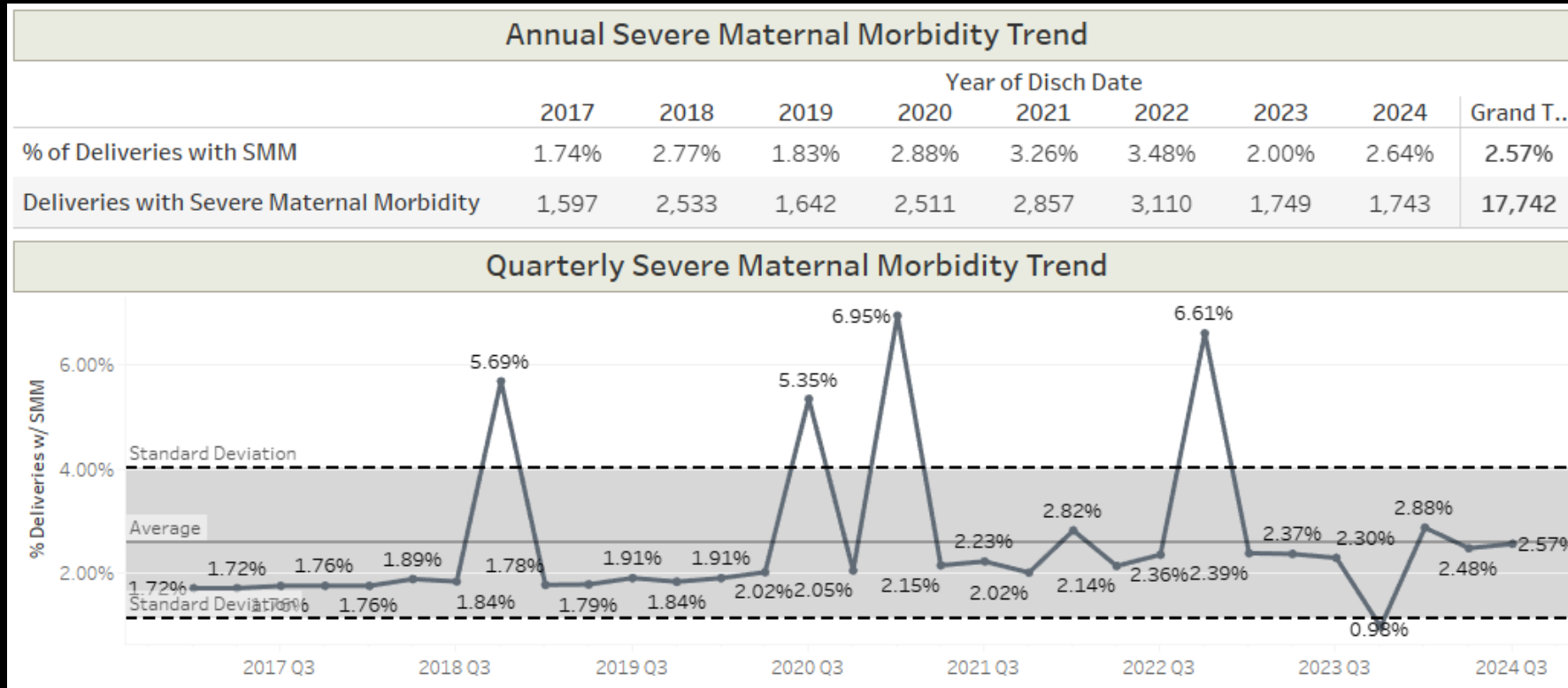# Caesarean Section Rate



Share of Deliveries by DRG Category

- C-Section Rate in Virginia (2023): 33.05%, closely aligned with the national average (32.4%).

- Low-Risk C-Sections: 26.7% in Virginia, above the Healthy People 2030 goal (23.6%).

- Trend: 4% decrease over the past decade, reflecting efforts to reduce unnecessary C-sections.
Source: March of Dimes Peristats

# Top Chronic Conditions



Deliveries by Chronic Condition

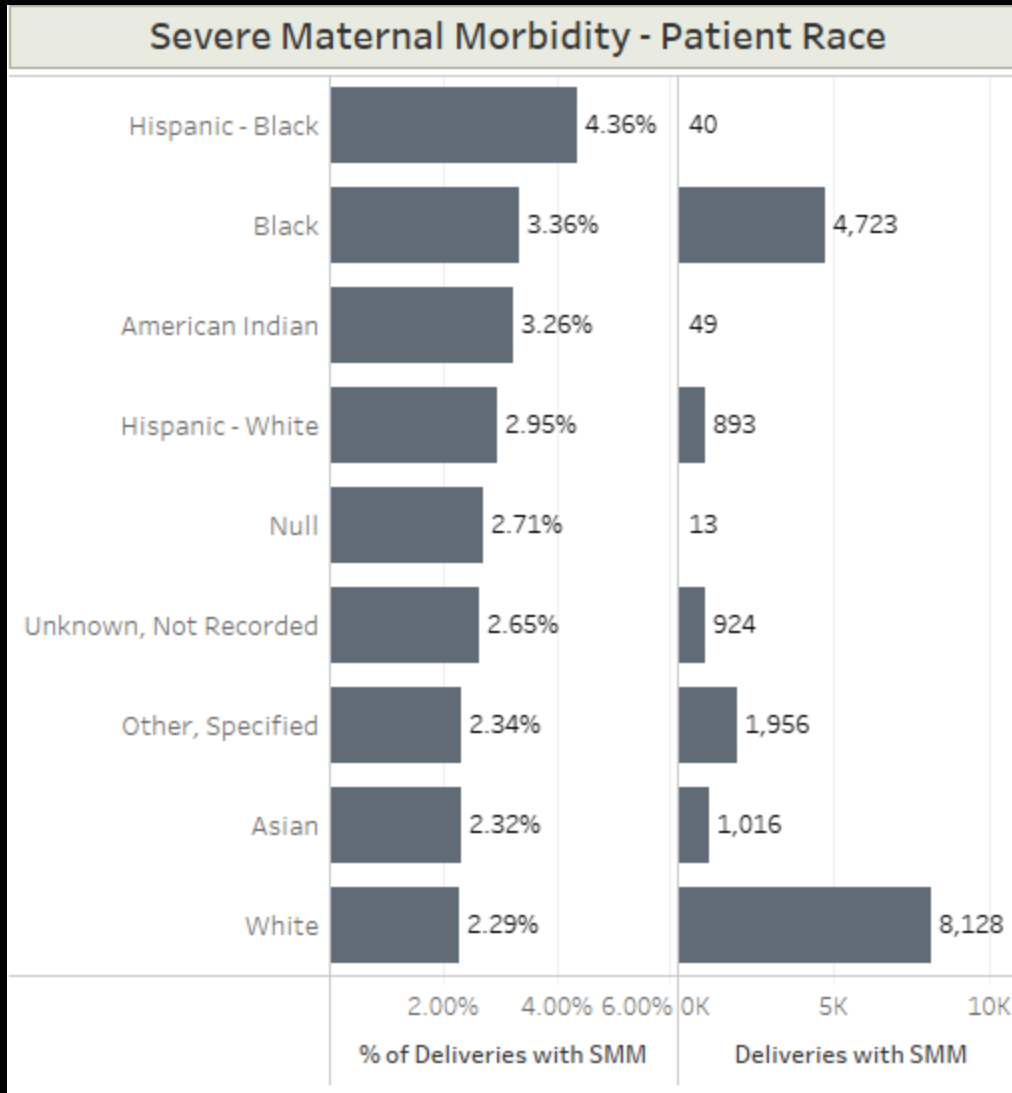| Condition | % of Total Deliveries |
|---|---|
| No Chronic Condition | 60.69% |
| ANEMIA | 14.32% |
| OBESITY | 8.43% |
| ANXIETY DISORDERS | 7.66% |
| ASTHMA | 6.51% |
| TOBACCO USE | 4.30% |
| DEPRESSIVE DISORDERS | 4.21% |
| ACQUIRED HYPOTHYROIDISM | 3.13% |
| DEPRESSION | 2.68% |
| DEPRESSION, BIPOLAR, OR OTHER DEP.. | 2.01% |

- **Nearly 40% of deliveries involve a maternal chronic condition.**

- Top conditions:
  - Anemia (14.3%) – Increases risk of postpartum hemorrhage & low birth weight.
  - Obesity (8.4%) – Higher risk of gestational diabetes, C-section, and hypertension.

- Mental health conditions (Anxiety: 7.7%, Depression: 6.2%) – Linked to preterm birth & postpartum complications.

- Key takeaway: Address chronic conditions early in pregnancy through screening, intervention, and care coordination.

# Severe Maternal Morbidity Trends

## Annual Severe Maternal Morbidity Trend

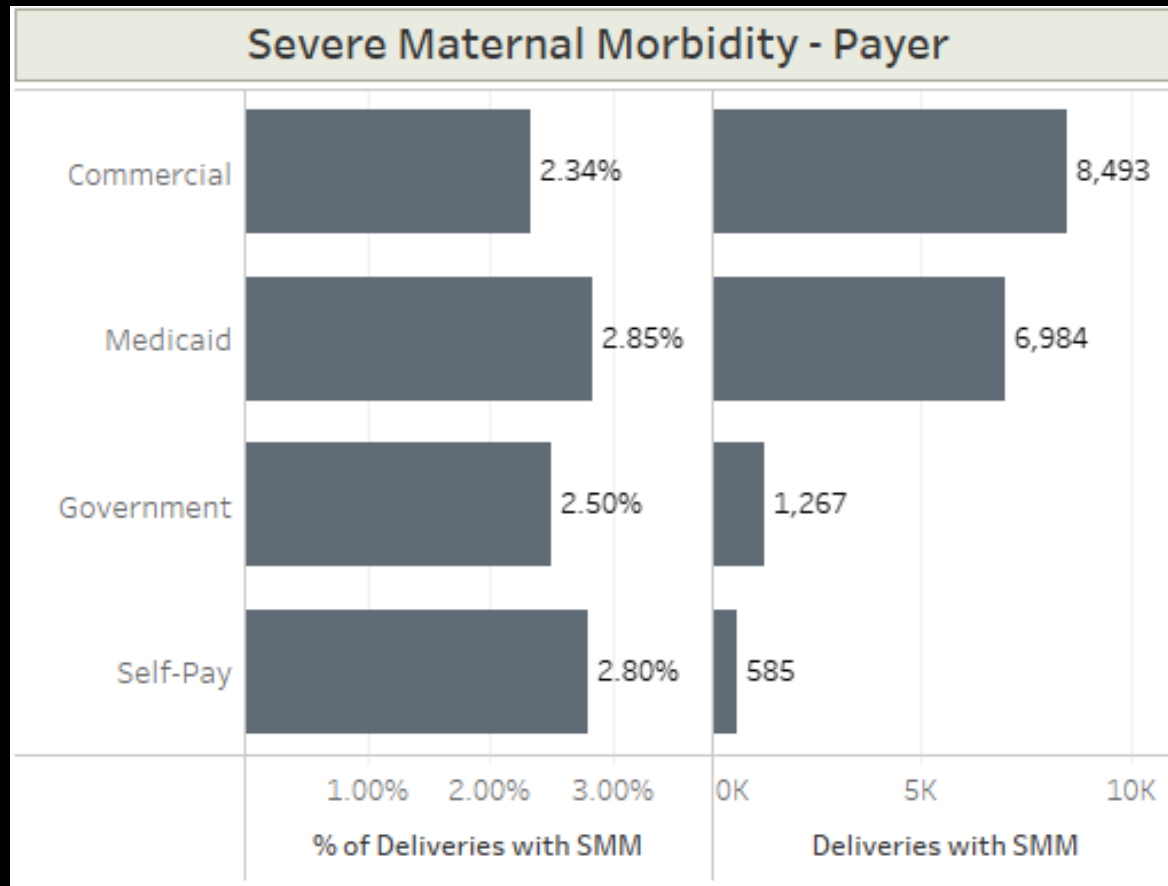| | Year of Disch Date | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Grand T.. |
| % of Deliveries with SMM | 1.74% | 2.77% | 1.83% | 2.88% | 3.26% | 3.48% | 2.00% | 2.64% | 2.57% |
| Deliveries with Severe Maternal Morbidity | 1,597 | 2,533 | 1,642 | 2,511 | 2,857 | 3,110 | 1,749 | 1,743 | 17,742 |

## Quarterly Severe Maternal Morbidity Trend



- SMM Rate Increased Over Time:
- 2017: 1.74% → 2021: 3.26% (peak) → 2024: 2.64%.
- Fluctuations suggest episodic spikes rather than a continuous rise.
- Peaks in 2019 (5.69%), 2021 (6.61%) suggest acute healthcare system stressors (e.g., pandemic impact, resource strain).
- SMM includes hemorrhage, cardiac events, sepsis, and emergency interventions.
- Higher rates indicate increased pregnancy-related complications requiring ICU-level care.

# Maternal Health Disparities



Severe Maternal Morbidity - Patient Race

- Hispanic-Black mothers (4.36%) have the highest SMM rate, though their total cases are low.

- Black mothers (3.36%) have the second-highest rate but a much higher total volume (4,723 cases).

- White mothers (2.29%) have the lowest SMM rate but the highest total cases (8,128) due to larger birth numbers.

# Maternal Health Disparities



Severe Maternal Morbidity - Payer

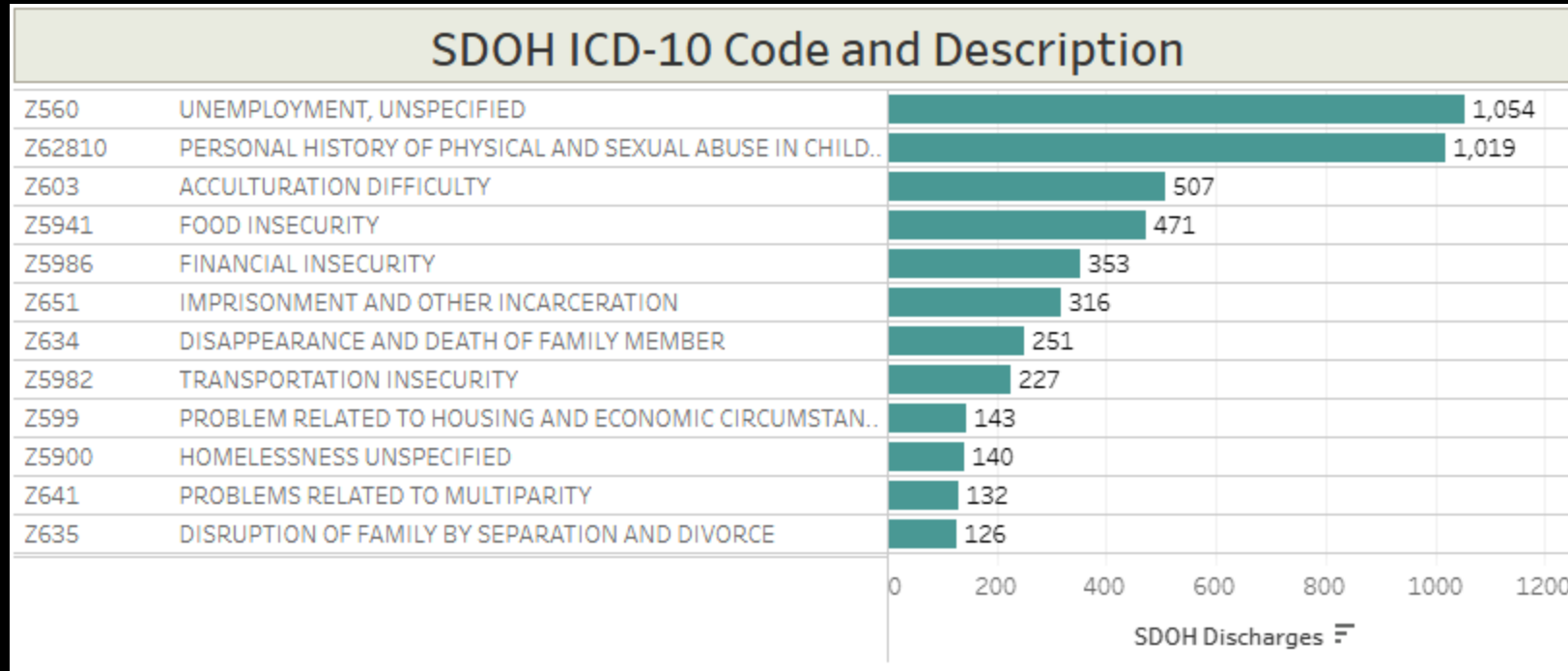| Payer | % of Deliveries with SMM | Deliveries with SMM |
|---|---|---|
| Commercial | 2.34% | 8,493 |
| Medicaid | 2.85% | 6,984 |
| Government | 2.50% | 1,267 |
| Self-Pay | 2.80% | 585 |

• Commercial insurance has the highest total SMM cases (8,493), but the lowest rate (2.34%), suggesting better access to care.

• Medicaid has both a high SMM rate (2.85%) and the second-highest case volume (6,984), indicating a greater burden on publicly insured mothers.

# SDOH & Maternal Outcomes



SDOH ICD-10 Code and Description

| Code | Description | SDOH Discharges |
|------|-------------|-----------------|
| Z560 | UNEMPLOYMENT, UNSPECIFIED | 1,054 |
| Z62810 | PERSONAL HISTORY OF PHYSICAL AND SEXUAL ABUSE IN CHILD.. | 1,019 |
| Z603 | ACCULTURATION DIFFICULTY | 507 |
| Z5941 | FOOD INSECURITY | 471 |
| Z5986 | FINANCIAL INSECURITY | 353 |
| Z651 | IMPRISONMENT AND OTHER INCARCERATION | 316 |
| Z634 | DISAPPEARANCE AND DEATH OF FAMILY MEMBER | 251 |
| Z5982 | TRANSPORTATION INSECURITY | 227 |
| Z599 | PROBLEM RELATED TO HOUSING AND ECONOMIC CIRCUMSTAN.. | 143 |
| Z5900 | HOMELESSNESS UNSPECIFIED | 140 |
| Z641 | PROBLEMS RELATED TO MULTIPARITY | 132 |
| Z635 | DISRUPTION OF FAMILY BY SEPARATION AND DIVORCE | 126 |

- SDoH coding in in-hospital deliveries remains rare, with <1% of births coded from 2017-2022, but rising to 1% in 2023 and 2.5% in 2024 so far.
- Unemployment (Z560) & History of Abuse (Z62810) – Most frequently coded, exceeding 1,000 cases each.
- Food Insecurity (Z5941) & Financial Insecurity (Z5986) – Significant, but underreported.
- Housing instability & incarceration (Z599, Z5900, Z651) – Highlighting systemic barriers impacting maternal health.
- SDoH coding is still uncommon due to lack of reimbursement, despite growing recognition of its impact on maternal outcomes.

# Executive Summary

- 690K+ births (2017-2024); ~88K births per year, slight decline in recent years.

- C-Section Rate (2023): 33.05% (aligned with national avg.), but low-risk C-sections (26.7%) exceed target (23.6%).

- Severe Maternal Morbidity (SMM):
  1.74% (2017) → 3.26% (2021) → 2.64% (2024).

- Black & Hispanic-Black mothers face highest SMM rates.

- Chronic conditions (40% of deliveries): Anemia, obesity, mental health issues increase risks.

- Medicaid SMM rate (2.85%) slightly exceeds commercial insurance (2.34%).