

# Virginia Severe Maternal Morbidity Profile

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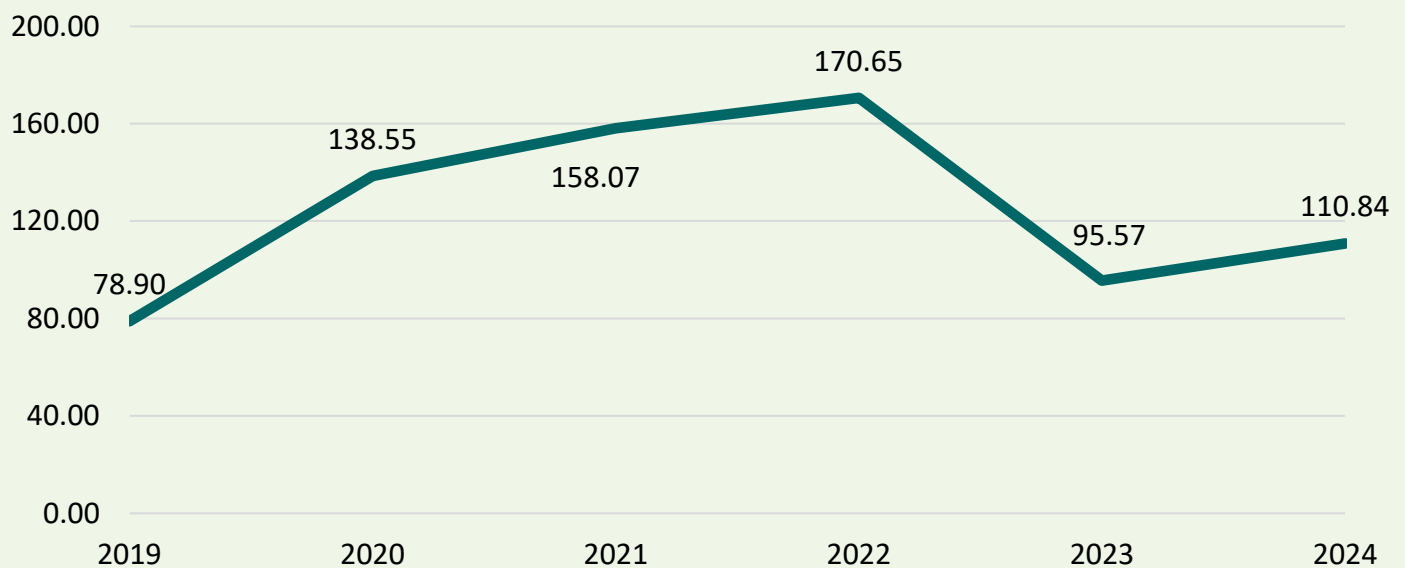


## Background

- Severe maternal morbidity (SMM) is defined as unexpected outcomes during the delivery hospitalization that result in significant short- and long-term consequences to a person's health.<sup>2</sup>
  - Other than health effects, increased medical costs and longer hospitalization stays are associated with SMM.<sup>2</sup>
- A 2024 study found that individuals with SMM were more likely to deliver in a teaching tertiary care hospital (40.8% vs 51.1%), and to have preexisting conditions (eg,  $\geq 2$  conditions: 1.2% vs 5.3%), gestational diabetes (8.2% vs 11.7%), stillbirth (0.5% vs 1.6%), preterm birth (7.7% vs 25.0%), or cesarean delivery (31.0% vs 54.3%).<sup>1</sup>
- The US sees about 650 to 750 maternal deaths annually, and 50,000 to 60,000 cases of SMM annually.<sup>3</sup>
  - In 2016-2017, the US SMM rate was approximately 140 per 10,000 deliveries (1.4%).<sup>3</sup>

## Severe Maternal Morbidity is Recovering to Pre-Pandemic Levels.

SMM rate per 10k hospital deliveries, 2019-2024



4. VHHA, Maternal Health Dashboard (2025), Accessed April 2025

# Methods

## Defining Severe Maternal Morbidity

In measuring Severe Maternal Morbidity (SMM), it is crucial to have a clear and consistent definition to ensure reliable analysis and results. However, there is no single universal definition for SMM, and data collection methods can vary significantly by state or even by hospital. At the Virginia Neonatal Perinatal Collaborative (VNPC), we adhere to the definition put forth by the Centers for Disease Control and Prevention (CDC) and the Alliance for Innovation on Maternal Health (AIM).

CDC and AIM define SMM using 21 diagnostic and procedural indicators.<sup>2</sup> These indicators include severe complications such as acute myocardial infarction, aneurysm, acute renal failure, and eclampsia, among others (see end of report). These indicators are used to identify cases where people experience significant health issues during inpatient labor and delivery.

Despite the comprehensive list of 21 indicators, the CDC recommends excluding cases where “blood transfusions” are the only indicator.<sup>2</sup> This recommendation is because data on blood transfusions alone do not adequately quantify the severity of the morbidity. It is likely that a major blood transfusion would be accompanied by another indicator on the list, providing a more accurate representation of severe maternal morbidity.

By adhering to these definitions and guidelines, the VNPC aims to ensure that the measurement and analysis of SMM are consistent and reliable, contributing to better maternal health outcomes.

## Data Extraction & Analysis

SMM data in this report were collected from the Virginia Maternal Health Dashboard. The dashboard is a tool created by the VNPC with the Virginia Hospital and Healthcare Association (VHHA) to display hospital discharge data. The data in the dashboard encompass discharges from inpatient hospital visits, filtered to show all diagnosis-related group (DRG) codes that identify birth events. This comprehensive approach ensures that the data accurately reflect maternal health outcomes across the state. Data in the Maternal Health Dashboard are representative of all Virginia hospitals, as they are required to submit this information according to the 1993 legislation, the Patient Level Data System Act.

The Maternal Health Dashboard includes a flag for Severe Maternal Morbidity (SMM) – excluding blood transfusions based on the definition put forth by the CDC and AIM. By using this standardized definition, the dashboard ensures consistency in identifying and reporting SMM cases, which is crucial for effective monitoring and intervention. All SMM calculations in this report are excluding cases where blood transfusions are the only indicator.

**SMM is higher in black, Medicaid, and older maternal populations.**

Virginia SMM disaggregated by race, payer, and age, 2019-2024.

Variable		Number	Rate per 10K Deliveries
Overall		6662	125.06
Race	White	3083	114.46
	Black	1794	169.38
	Other Minority	1745	113.14
Payer	Commercial	3205	115.73
	Medicaid	2650	139.26
	Other Payer	767	123.16
Age	<20	241	128.44
	20-29	2517	112.81
	30-39	3423	129.32
	40-49	434	190.96

4. VHHA, Maternal Health Dashboard (2025), Accessed April 2025

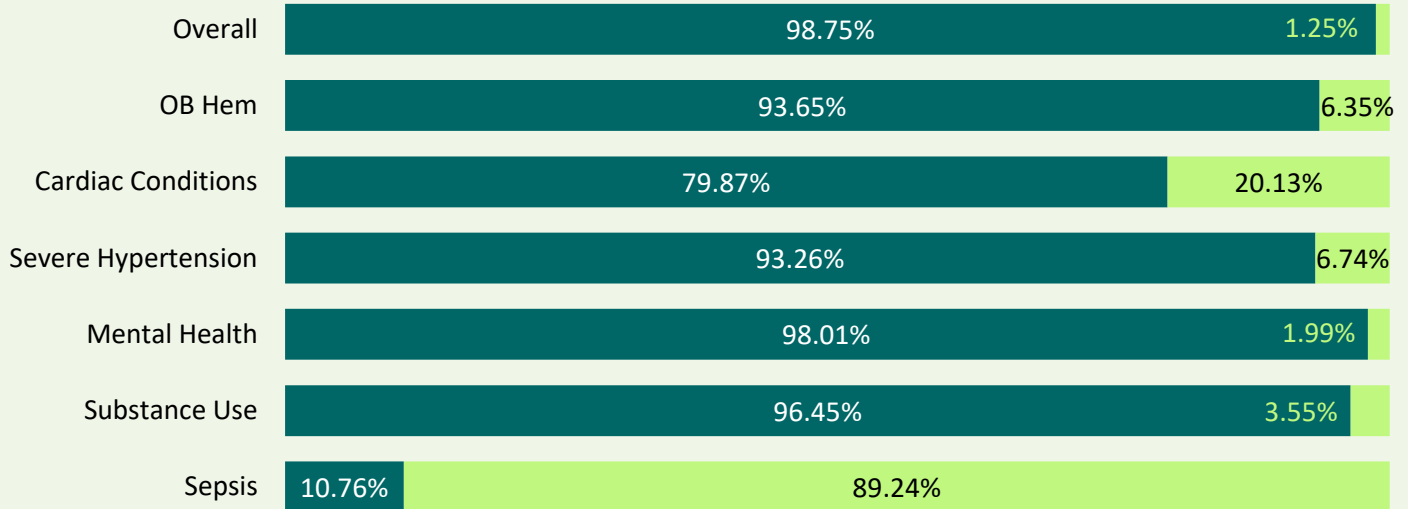
## Common Maternal Complications

Severe maternal morbidity often occurs with other maternal health complications. Complications shown below are captured according to the guidelines for the AIM patient safety bundles. Data show 1.25% of Virginia deliveries from 2019-2024

classified as SMM. Mental Health Conditions (PMHC) represent the complication with the lower SMM rate with 1.99% of deliveries being SMM, and Sepsis deliveries having a higher SMM occurrence at 89.24%.

Severe Maternal Morbidity is more prevalent with maternal complications.

For each complication, percentage of cases with and without SMM, 2019-2024.



4. VHHA, Maternal Health Dashboard (2025), Accessed April 2025 ■ No SMM ■ SMM

## Geography

SMM rates are variable based on changes in geography. The map below is highlighting SMM rates as they differ by Virginia counties/localities from 2019-2024. Rural areas in Central and Southwest Virginia display a higher concentration of counties with SMM rates greater than 175 per 10,000 deliveries. Northern and Northwest Virginia

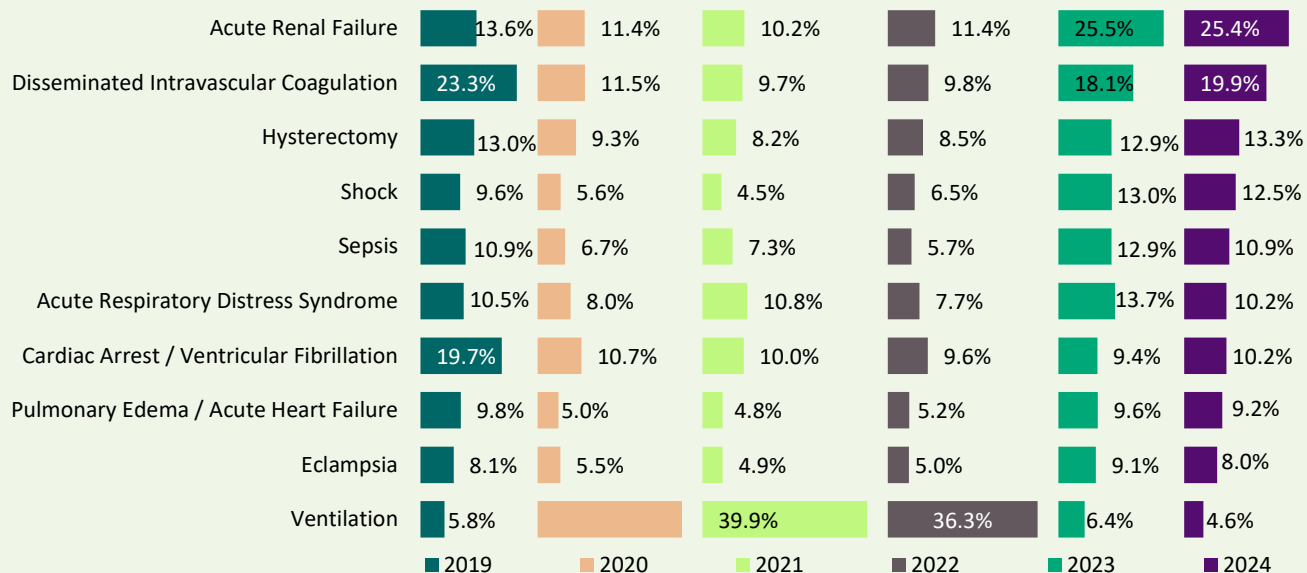
show the highest concentration of counties with lower SMM rates with most counties falling below the state average of 125 per 10,000 deliveries. Central and Eastern Virginia counties have SMM rates close to the state average around 100 to 150 per 10,000 deliveries. Suppressed counties are those that have fewer than 10 SMM deliveries.



## Leading SMM Causes

Ventilation peaked during COVID-19 pandemic, but now Acute Renal Failure is leading cause of Severe Maternal Morbidity.

10 leading SMM causes as a percent of all SMM cases annually, 2019-2024.



4. VHHA, Maternal Health Dashboard (2025), Accessed April 2025

## 21 Causes of SMM– CDC<sup>2</sup>

- Diagnoses
  - Heart
    1. Acute myocardial infarction
    2. Cardiac arrest/ventricular fibrillation
    3. Heart failure/arrest during surgery or procedure
    4. Pulmonary edema/acute heart failure
  - Lung
    5. Acute respiratory distress syndrome
  - Blood or blood vessel
    6. Air and thrombotic embolism
    7. Disseminated intravascular coagulation
    8. Amniotic fluid embolism
    9. Aneurysm
    10. Puerperal cerebrovascular disorders
  - Infection
    11. Eclampsia
    12. Sickle cell disease with crisis
    13. Sepsis
  - Kidney
    14. Acute renal failure
  - Other
    15. Shock
    16. Severe anesthesia complications
- Procedures
  17. Blood transfusion (excluded)
  18. Conversion of cardiac rhythm
  19. Hysterectomy
  20. Temporal tracheostomy
  21. Ventilation

### Sources

1. Blackman A, Ukah UV, Platt RW, et al. Severe Maternal Morbidity and Mental Health Hospitalizations or Emergency Department Visits. *JAMA Netw Open.* 2024;7(4):e247983. doi:10.1001/jamanetworkopen.2024.7983
2. CDC. “Severe Maternal Morbidity.” *Maternal Infant Health*, 20 May 2024, [www.cdc.gov/maternal-infant-health/php/severe-maternal-morbidity/index.html](http://www.cdc.gov/maternal-infant-health/php/severe-maternal-morbidity/index.html).
3. Declercq, Eugene, and Laurie Zephyrin. “Severe Maternal Morbidity in the United States: A Primer.” *Www.commonwealthfund.org*, 28 Oct. 2021, [www.commonwealthfund.org/publications/issue-briefs/2021/oct/severe-maternal-morbidity-united-states-primer](http://www.commonwealthfund.org/publications/issue-briefs/2021/oct/severe-maternal-morbidity-united-states-primer).
4. Virginia Hospital and Healthcare Association. (2025). *Maternal Health Dashboard*.