

Bundle of Joy™

Maternal & Infant Health Trends Series

Report 2: The Added Cost of Complications During and After Delivery

Analyzing the Prevalence of Preventable Complications, their Pre-Existing Risk Factors and the Correlation to Cost

The U.S. birthrate fell to 3.78 million babies in 2018, the fourth consecutive year of decline in the number of babies born across the nation¹. While fewer babies are being born, the cost of delivering them is rising. Labor and delivery cost the U.S. healthcare system more each year, in part due to preventable complications and manageable chronic conditions.

The maternal population today has more comorbidities than ever, both pregnancy-related, such as preeclampsia, and pre-existing conditions, such as chronic pain, diabetes, behavioral health disorders and obesity². Pre-existing conditions and comorbidities also increase the likelihood of a woman experiencing a severe maternal morbidity (SMM) factor. SMM factors are unexpected outcomes of labor and delivery and include heart failure, heart attacks and sepsis. Premier [recently identified](#) a 36 percent increase in SMM rates from 2008-2018, including a 79 percent higher SMM rate for black women than white women. The increase in SMM rates could be due to several factors, such as changes in coding, age, race, payer, type of delivery, substance use, region and hospital type.

Complications contribute directly to higher healthcare costs.

Complications add, on average, 20 percent to the cost of a vaginal delivery and 25 percent to the cost of a cesarean delivery. SMM, meanwhile, escalates the episodic cost of care by anywhere from a few hundred dollars up to \$25,000. Correspondingly, women with SMM stay in the hospital about 70 percent longer than those without SMM complications.

These incremental additions come on top of the steadily climbing cost to hospitals to perform deliveries that have no complicating conditions. Over the three-year period from 2015 to 2018, the average cost to the hospital to perform a vaginal delivery without complications rose nearly 13 percent, while the average cost for a cesarean delivery without complications increased more than 17 percent.

These are key findings from a Premier analysis that examined how cost varies for maternal patients based on type of delivery, complications, existence of chronic conditions, demographics and more. The analysis surveyed the cost of delivery for women from 2008 through 2018, and specifically examined the hospital discharges of 2.7 million maternal patients across 613 hospitals from 2015 through 2018 to drill into cost variation by complications.



Severe Maternal Morbidity and Complications

More than a third of SMM cases are potentially preventable³, and SMM adds thousands of dollars to the average cost per patient, incurring additional length of stay and ongoing treatment, sometimes for decades after. In 2018, SMM affected 153 of every 10,000 vaginal births and 324 of every 10,000 cesarean deliveries. The SMM rate [has increased](#) 36 percent since 2008.

Cost and Length of Stay:

The cost of a vaginal delivery with SMM is nearly 80 percent more than the cost of a vaginal delivery without SMM factors. Accordingly, women who experience SMM factors associated with their vaginal deliveries stay in the hospital about 70 percent longer.

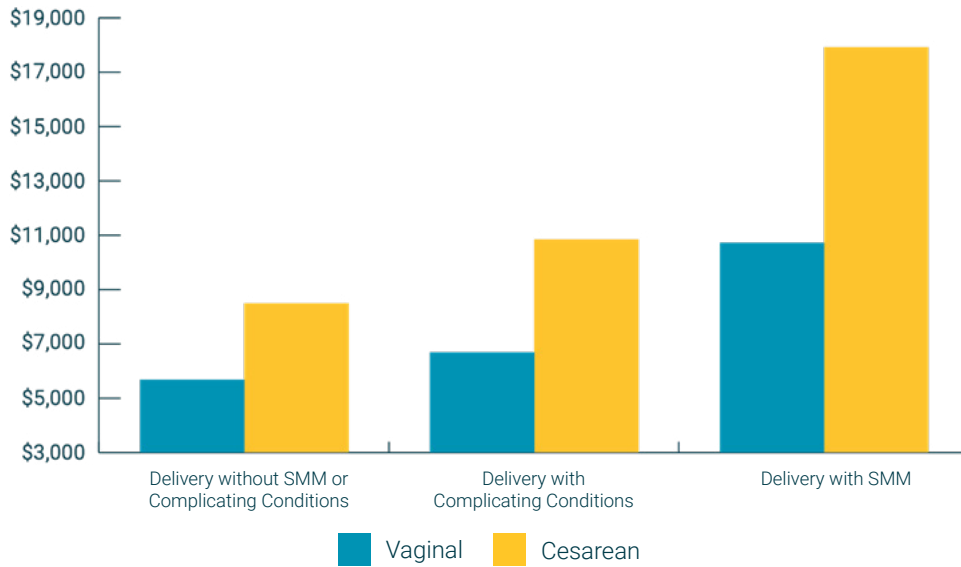
The cost for a cesarean delivery with SMM is increasing at a rate of \$500 per year, while the cost of a vaginal delivery with SMM is increasing at a rate of about \$200 per year. A cesarean delivery with SMM costs nearly double that of a cesarean without SMM, and its 5.6 day-length of stay outpaces the average hospital stay of 4.5 days⁴.

Figure 1:

	Average Cost	Average Length of Stay
Vaginal Delivery without SMM or Complicating Conditions	\$5,681	2.3 days
Vaginal Delivery with Complicating Conditions	\$6,691	2.9 days
Vaginal Delivery with SMM	\$10,720	3.9 days
Cesarean Delivery without SMM or Complicating Conditions	\$8,491	3.2 days
Cesarean Delivery with Complicating Conditions	\$10,852	4.2 days
Cesarean Delivery with SMM	\$17,927	5.6 days

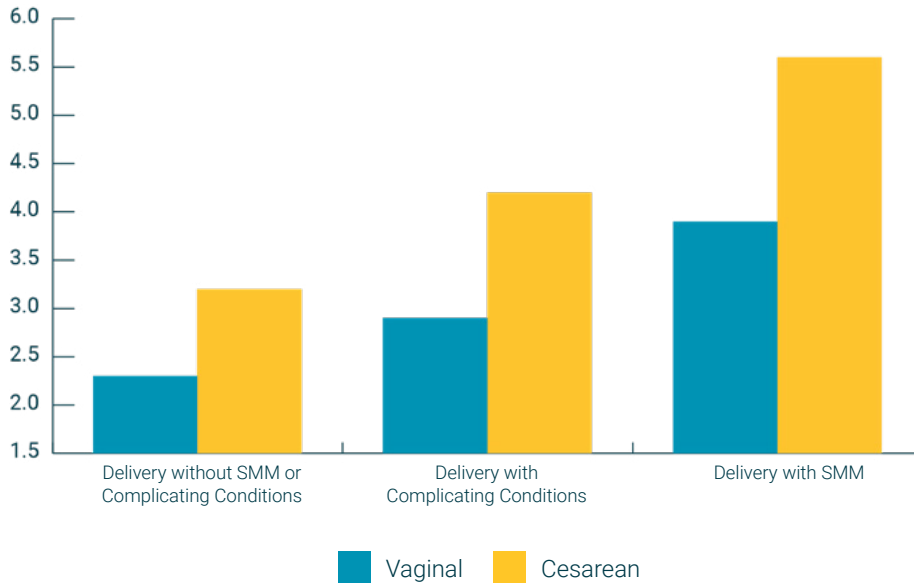
Average Cost by Delivery Type

Figure 2:



Average Length of Stay by Delivery Type

Figure 3:

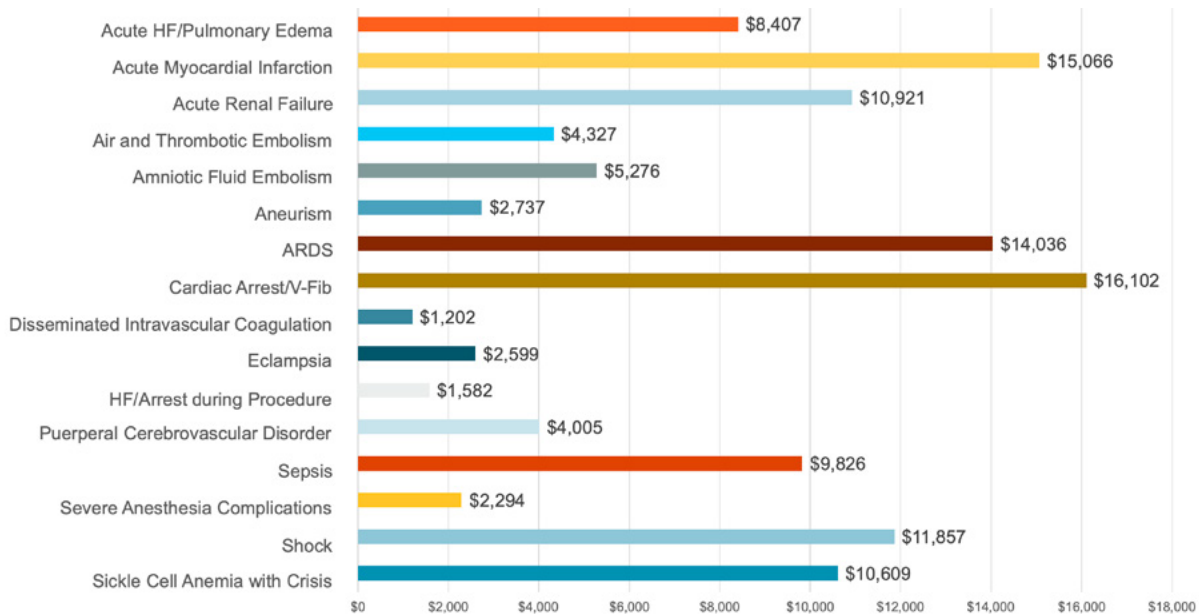


The Most Expensive Morbidity Factors

The SMM factors that incur the highest cost across both vaginal and cesarean deliveries are cardiac arrest, acute myocardial infarction (heart attacks), acute respiratory distress syndrome (ARDS, in which fluid collects in the lungs' air sacs) and shock.

Figure 4:

Incremental Additional Cost per Case of Severe Maternal Morbidity Factors for a Vaginal Delivery

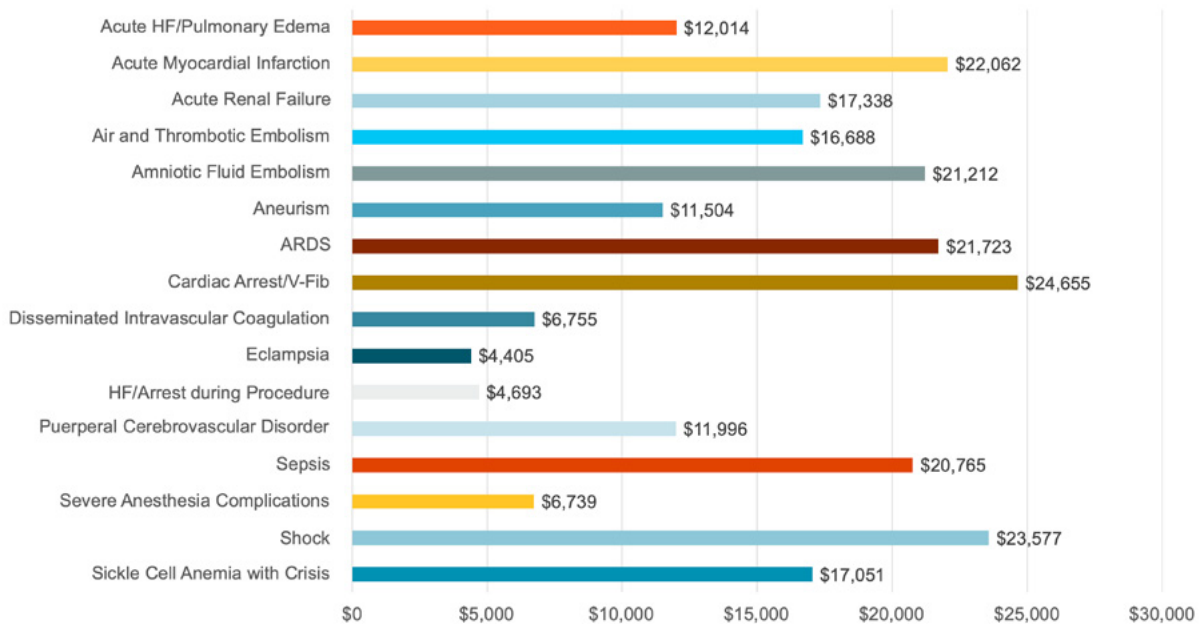


Incremental cost shown is in addition to base cost per case of \$5,681 for vaginal delivery without complications or SMM

On average, having one of the top five SMM factors for a vaginal delivery adds \$13,600 to the base cost of \$5,681 for a vaginal delivery without SMM or complicating conditions.

Figure 5:

Incremental Additional Cost per Case of Severe Maternal Morbidity Factors for a Cesarean Delivery



Incremental cost shown is in addition to base cost per case of \$8,491 for C-section without complications or SMM

On average, having one of the top five SMM factors for a cesarean adds \$22,650 in addition to the base cost of \$8,491 for a cesarean without SMM or complicating conditions.

Preeclampsia/Eclampsia and Hemorrhage

Two maternal harm complications that are among the leading causes of preventable SMM and mortality are preeclampsia/eclampsia and hemorrhage.

Preeclampsia and eclampsia are complications that are categorized by high blood pressure and signs of damage to another organ system, most often the liver and the kidneys. The cost of a delivery with eclampsia or preeclampsia is \$12,392, about 74 percent more than a delivery without these complications.

Obstetric hemorrhage is extensive bleeding that may occur before or after delivery, but more than 80 percent of cases occur postpartum⁵. It is estimated that 75 percent of deaths related to obstetric hemorrhage are preventable⁶. The cost of a delivery with hemorrhage is \$10,337, about 45 percent more than a delivery without hemorrhage.

By Payer

SMM is more likely to affect patients who cannot afford their care or lack insurance. The rate of occurrence of SMM factors is approximately 4 percent higher for patients on charity/indigent care, indicative of the lack of reliable prenatal care for this population. Similarly, patients with Medicaid as a payer had a 3 percent higher rate. Patients with commercial insurance account for the smallest proportion of deliveries with SMM factors, 1.7 percent.

Pre-Existing Risk Factors: Chronic Conditions, Behavioral Health and Substance Use Disorders

A pregnant woman today is more likely to have a pre-existing condition than in decades past, primarily due to the rising prevalence of chronic diseases in the American population. Pre-existing conditions present significant risk factors for labor and delivery complications. From obesity to diabetes, chronic diseases now affect almost half of all American adults. As many women are having babies later in life, chronic conditions can play a greater role in deliveries.

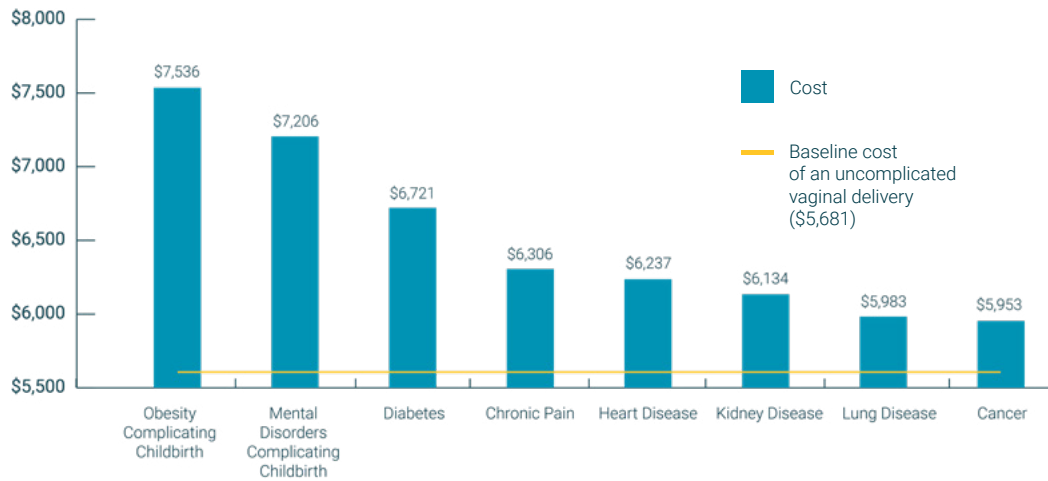
Chronic Conditions

Three common conditions that result in higher maternal healthcare costs are chronic pain, diabetes and obesity. Having one of these conditions adds, on average, \$1,006 to the base cost of an uncomplicated vaginal delivery and \$2,264 to the base cost of an uncomplicated cesarean delivery.

Pre-existing, chronic conditions such as heart disease and diabetes are linked to negative health outcomes and a higher cost of care for both mothers and babies. Poorly controlled diabetes in pregnant women, for example, presents an increased risk for preeclampsia, hypertension and adverse birth outcomes. Meanwhile, recent studies indicate that up to 25 percent of women are obese prior to becoming pregnant⁷, which places them at greater risk for pregnancy comorbidities like heart disease, stroke, diabetes and certain types of cancer. Women with chronic conditions are more likely to have complicated cesarean deliveries, resulting in costs that are up to 90 percent higher than an uncomplicated vaginal delivery.

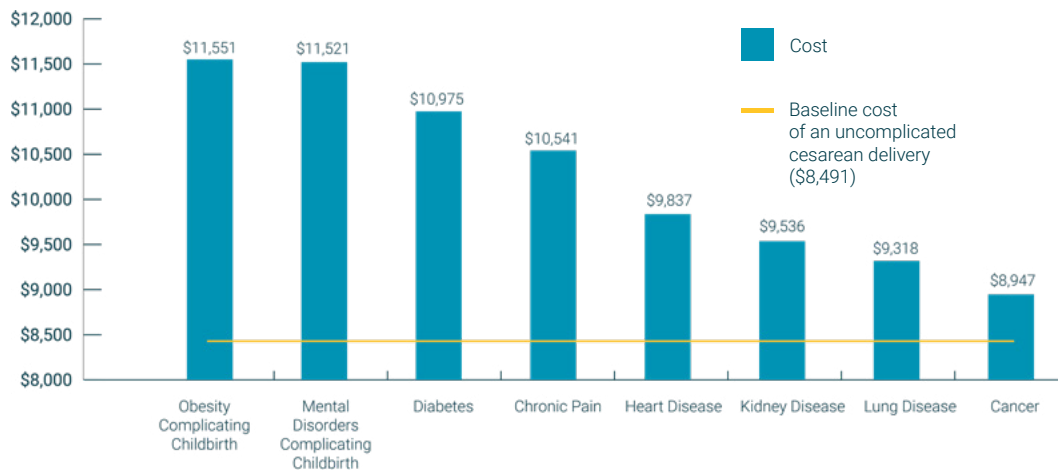
Cost of Chronic Conditions for a Vaginal Delivery

Figure 6:



Cost of Chronic Conditions for a Cesarean Delivery

Figure 7:



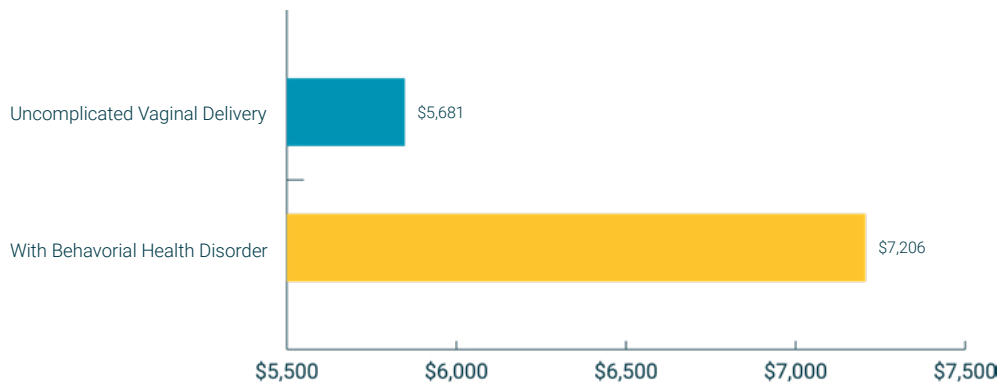
Behavioral Health

A hospital codes mental disorders complicating childbirth to include anxiety, depression and psychosis. Perinatal mood and anxiety disorders affect up to one in seven pregnant and postpartum women, yet half of perinatal women with a diagnosis of depression are not treated. The estimated economic impact is \$7.5 billion for not treating mental health disorders in the mother's first year⁸.

Behavioral health disorders complicating childbirth add 27 percent to the cost of an otherwise uncomplicated vaginal delivery and nearly 36 percent to the cost of an uncomplicated cesarean delivery.

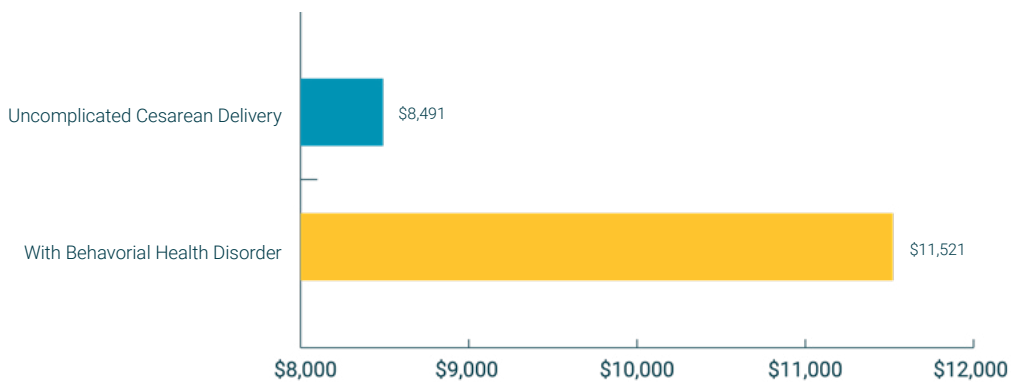
Average Cost of a Vaginal Delivery with a Behavioral Health Disorder

Figure 8:



Average Cost of a Cesarean Delivery with a Behavioral Health Disorder

Figure 9:



Neonatal Abstinence Syndrome

Substance use disorders are playing a greater role in perinatal health, as mothers with substance use disorders [increased 153 percent](#) from 2008 to 2018, and the percent of babies with neonatal abstinence syndrome (NAS) rose 140 percent. In 2014, NAS contributed to nearly 7 percent of total neonatal hospital costs, up from 1.6 percent 10 years prior⁹. The neonatal intensive care unit is one of the most expensive rooms in the hospital, and research shows that babies born with NAS require intensive care. Research suggests these babies stay in the hospital nearly 3.5 times longer, on average, than non-affected babies (16.6 hospital days vs. 4.9), and cost the hospital more than triple compared to non-affected babies (\$16,893 vs. \$5,610)¹⁰.

This is Premier's first analysis on the cost of maternal healthcare, and its second in its series on maternal and infant health trends, conducted as part of its Bundle of Joy™ campaign. The campaign is designed to test and scale measurable improvement in the quality, safety and cost of care for mothers and babies in the U.S. Premier's analyses on the key drivers of maternal and infant mortality and morbidity, as well as the costs associated with these trends, will serve as a baseline for measuring hospital improvement.

Methodology

Findings were derived from the Premier Healthcare Database, which Premier used to analyze the cost of delivery for women from 2008 through 2018, and specifically examined the hospital discharges of 2.7 million maternal patients treated at 613 hospitals across 42 states to drill into cost variation by complications.

References

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