



# Cesarean Delivery Factsheet (October 2021)

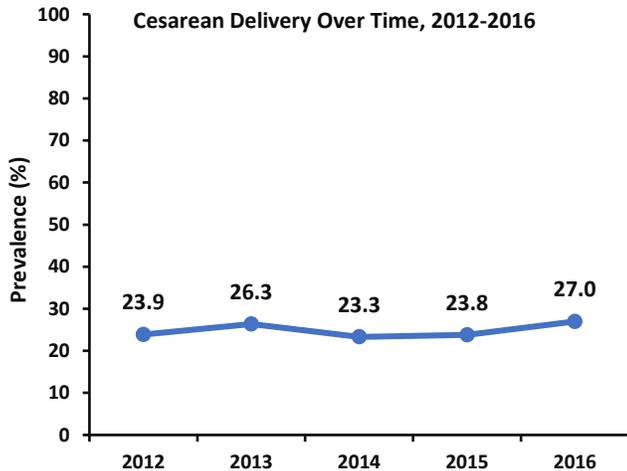
## Pregnancy Risk Assessment Monitoring System

### Cesarean Delivery

Cesarean delivery, also known as a C-section, is a surgical operation in which the infant is birthed through an incision in the mother's uterus and abdomen. Cesarean delivery is the most common major surgery performed in the United States and results in higher costs, longer hospitalization, and increased risks of maternal morbidity compared to women who deliver vaginally.<sup>1</sup> Cesarean deliveries are associated with maternal race and age, obesity, first-time delivery, previous cesarean deliveries, complicated pregnancy, preterm birth and other negative birth outcomes.<sup>2</sup> The National Healthy People 2030 objective was to reduce the rate of primary cesarean deliveries in low-risk women with no prior births to 23.6%.

### Trends over Time

In 2016, 27.0% of mothers in the State of Hawaii reported having a cesarean delivery. There appears to be an increase in cesarean delivery from 2012 to 2016, but estimates were not significantly different across the five-year span.



### Data Source

Data from a total of 6,648 respondents were analyzed from the 2012-2016 Hawaii's Pregnancy Risk Assessment Monitoring System (PRAMS), a population-based surveillance system for maternal behaviors before, during, and after pregnancy. 2012-2016 aggregated data were used in this analysis as there was no Hawaii PRAMS data collection for 2017-2018. 2019 data were not included in the analysis as only half a year of data was available.

Based on 2012-2016 data, about 24.9% of pregnancies in Hawaii were cesarean deliveries. Among these deliveries,

### Data Highlights

- From 2012-2016, approximately 24.9% of all deliveries in Hawaii were cesarean.
- Women more likely to have cesarean deliveries were 35 years and older, obese, had previous cesarean delivery, had second or third birth, and lived in Hawaii or Maui counties.
- Women with high blood pressure or gestational diabetes were more likely to have a cesarean delivery.
- Infants delivered by cesarean were more likely to be preterm, have low birthweight, be at an intensive care unit, and have a longer hospital stay. These infants were less likely to be breastfed for 8 or more weeks.

approximately 13.1% were first-time cesarean and 11.7% were repeated cesarean deliveries. First-time cesarean delivery was a significant predictor for subsequent cesarean deliveries.

### Maternal Characteristics Related to Cesarean Delivery

In Hawaii, women who were more likely to have cesarean deliveries were those who were 35 years and older, those who were obese (BMI>30), those who had a previous cesarean delivery, and those who had a second or third birth (Table 1). Compared to other counties, cesarean delivery rates were higher in Hawaii or Maui counties. There were no significant differences in the estimates of cesarean delivery among different race groups or among health insurance status groups prior to pregnancy.

### Perinatal Risks and Outcomes by Delivery Method

Women with high blood pressure as reported on the birth certificate may be associated with an increased rate of cesarean delivery. Those with gestational diabetes as reported on the PRAMS survey were more likely to have a cesarean delivery (Figure 1).

In Hawaii, the rate of preterm delivery (defined as <37 weeks) was 14.4% for cesarean delivery, compared to 7.3% for a vaginal delivery. The rate of labor abnormality was significantly higher for cesarean delivery (10.8%), compared to a vaginal delivery (1.3%). Infants delivered by cesarean delivery were also significantly more likely to have low birthweight (12.6%), compared to those delivered vaginally (5.5%). The rate of infants admitted to the intensive care unit (ICU) was significantly higher after a cesarean delivery (15.7%), compared to a vaginal delivery

(6.2%). Infants were more likely to have a longer hospital stay (6 or more days) after a cesarean delivery. Breastfeeding 8 or more weeks was less common among mothers who had a cesarean delivery, compared to a vaginal delivery.

**Table 1. Bivariate associations of cesarean delivery with selected maternal characteristics, Hawaii PRAMS 2012 to 2016**

	Prevalence (%)	95% CI <sup>*</sup>
<b>Maternal Race</b>		
White	23.6	20.8-26.4
Native Hawaiian	24.0	21.6-26.5
Filipino	26.2	22.9-29.4
Japanese	25.2	20.7-29.8
Other Pacific Islanders	25.7	20.2-31.3
Other/Unknown	26.3	22.5-30.1
<b>Maternal Age (years)</b>		
Under 20	11.5	7.0-15.9
20-34	23.6	22.1-25.2
35-52	32.6	29.3-36.0
<b>County of Residence</b>		
Honolulu	22.9	21.1-24.7
Hawaii	31.5	29.2-33.9
Maui	29.9	27.5-32.3
Kauai	26.1	23.7-28.4
<b>Body Mass Index (BMI)</b>		
Underweight (BMI <18.5)	12.8	8.1-17.6
Normal (BMI 18.5-24.9)	21.8	20.0-23.6
Overweight (BMI 25-29.9)	26.2	23.2-29.3
Obese (BMI >30)	36.4	32.7-40.1
<b>Health Insurance Prior to Pregnancy</b>		
None	25.0	19.4-30.6
Medicaid/Quest	23.9	21.4-26.4
Military	25.9	21.9-29.9
Private Insurance	25.0	23.2-26.9
<b>Previous Cesarean Delivery</b>		
No Previous Cesarean Delivery	9.8	8.6-11.1
Previous Cesarean Delivery	85.7	82.6-88.9
No Previous Live Birth	22.9	20.5-25.2
<b>Parity</b>		
First Birth	22.9	20.5-25.2
Second or Third	27.5	25.4-29.6
Fourth or More	21.6	18.1-25.1

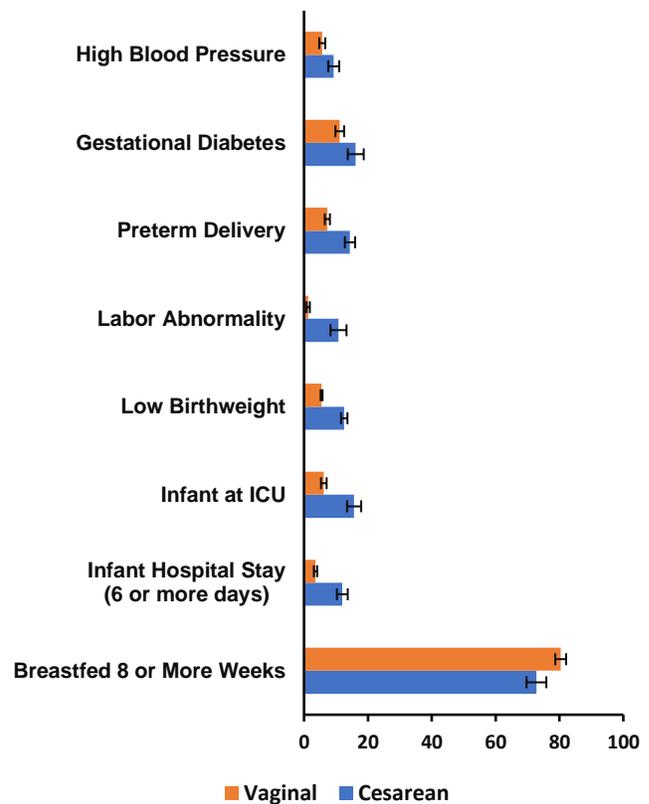
\* 95% CI refers to the 95% confidence interval around estimate.

## Discussion

The decision to have a cesarean delivery is complex and is indicated when there are medical risk factors or complications during labor that can affect the health of either the mother or the infant. It could also be a personal preference by either the provider or the woman, often termed an elective cesarean. It is unclear what the long-term risks are to both the mother and the newborn infant and how much elective cesarean deliveries are contributing to the overall increase in the overall rates of cesarean deliveries. Maternal age, obesity, high blood pressure, and gestational diabetes are associated with cesarean delivery. Having a previous cesarean delivery appears to be the most prominent risk factor for subsequent cesarean deliveries. These findings show that it is important to prevent the first cesarean delivery when possible.

Cesarean deliveries are associated with adverse outcomes for the mother and the infant. The data have been critical in raising awareness in the importance of reducing cesarean

**Figure 1: Perinatal Risks and Outcomes by Delivery Method, Hawaii PRAMS 2012-2016**



deliveries. To reduce cesarean delivery rates in Hawaii, it is important for healthcare providers to discuss different modes of delivery early on in the pregnancy and during preconception care, particularly with women who have had a previous cesarean delivery. In addition, providers are encouraged to focus on mitigating traditional risk factors such as obesity, maternal age, and preterm birth, which may help reduce morbidity in women.

### About the PRAMS Data

The Hawaii Pregnancy Risk Assessment Monitoring System (PRAMS) is a self-reported survey of recent mothers conducted by mail with telephone follow-up. It is designed to monitor the health and experiences of women before, during, and just after pregnancy. Every year in Hawaii, about 2,400 women who deliver an infant are randomly selected to participate. Race is singly coded based on the mother's self-report from the birth certificate.

#### Suggested Citation:

Fok, CCT, Awakuni, J, Shim, M. "Cesarean Delivery Factsheet" Honolulu, HI: Hawaii State Department of Health, Family Health Services Division; September 2021.

### References

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- Al Busaidi, I., Al-Farsi, Y., Ganguly, S., & Gowri, V. (2012). Obstetric and Non-Obstetric Risk Factors for Cesarean Section in Oman. *Oman Medical Journal*, 27(6), 478-481.