



*“They did an emergency c-section and told me I can only have children by c-section in the future.”*

*“They tried inducing me for a whole day but it didn’t work so I had a c-section.”*

*“I had a VBAC this pregnancy but my doctor was not supportive and dismissed me from his practice at 38 1/2 weeks for not getting a scheduled c-section. Thankfully I found another doctor.”*

PRAMS mothers

Cesarean delivery (CD) is the most common surgery performed in Maryland and the United States. The U.S. overall CD rate has increased by approximately 60% in roughly a decade, rising from 21% in 1998 to nearly 33% in 2009. CD rates in Maryland have undergone a similar increase, climbing from 21% in 1998 to 34% in 2009. Rates have generally plateaued for both the U.S. and Maryland from 2009-2013.

A cesarean delivery (also known as cesarean section or c-section) can be a life-saving procedure for both mother and infant in circumstances that require emergency delivery such as compromised health conditions and dangerous labor complications. However these surgeries may also result in higher costs and greater health problems for mother and baby. Each successive CD may cause higher risks for the mother.

## Prevalence of Cesarean Delivery (CD)

The Maryland PRAMS survey included two questions about cesarean delivery (CD):

- 1) How was your new baby delivered?  
A. Vaginally  
B. Cesarean delivery (c-section)

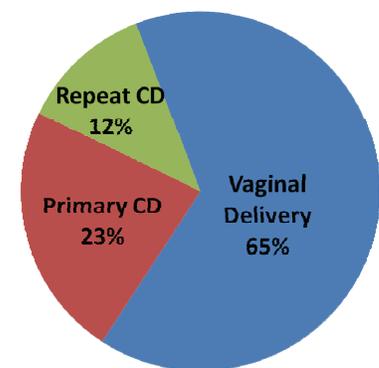
If the answer to the first question was (B) women were also asked:

- 2) What was the reason that your new baby was born by cesarean delivery (c-section)?

Check all that apply.

- A. I had a previous cesarean delivery  
B. My baby was in the wrong position  
C. I was past my due date  
D. My health care provider worried that my baby was too big  
E. I had a medical condition that made labor dangerous for me  
F. My health care provider tried to induce my labor, but it didn’t work  
G. Labor was taking too long  
H. The fetal monitor showed that my baby was having problems during labor  
I. I didn’t want to have my baby vaginally  
J. Other reason(s) please tell us: \_\_\_\_\_

Figure 1. Method of Delivery, 2009-2011



From 2009 through 2011, 35% of postpartum mothers reported that they delivered by CD and 65% delivered vaginally. Primary cesarean deliveries accounted for 66% of the total number of CDs and repeat CDs (any CD after a primary) accounted for 34%. PRAMS did not include any questions about VBAC (vaginal birth after cesarean) so these births cannot be separated from the total number of vaginal deliveries (Figure 1).

## Characteristics of Women by Delivery Method

**Table 1. Characteristics of Maryland Births by Delivery Method, Maryland, 2009-2011**

Factor	Vaginal delivery	Cesarean delivery Total %	Primary	Repeat
Age, years				
<20	81	19	19	0
20-34	65	34	23	11
≥35	55	45	25	20
Race/Ethnicity				
White, Non-Hispanic	65	35	23	12
Black, Non-Hispanic	61	39	26	13
Asian, Non-Hispanic	64	36	26	10
Hispanic	73	27	15	11
Education, years				
<12*	67	33	19	14
12	64	36	23	13
>12	62	38	25	13
Insurance, at delivery				
Medicaid	66	34	21	13
Other	64	36	25	11
Infant birth weight				
Low, <2500 g	48	52	40	12
Normal, ≥2500 g	66	34	24	10
Gestational Age				
<37 weeks	50	50	39	11
37-38 weeks	72	28	19	9
39+ weeks	65	35	25	10
Hypertension/preeclampsia				
Yes	45	54	43	11
No	67	33	23	10
Gestational diabetes				
Yes	52	48	32	16
No	66	34	24	10
Problems with placenta				
Yes	58	42	32	10
No	65	35	24	10
Assisted Reproductive Technology				
Yes	41	59	54	5
No	67	33	23	10

The highest prevalence of primary CD (first cesarean delivery regardless of number of previous deliveries) were among women who reported they had used assisted reproductive technology for their delivery (54% reported a primary cesarean delivery), were hypertensive (43%), or delivered a low birth weight infant (40%) (Table 1).

Women who were Hispanic, under 20 years of age, or delivered at 37-38 weeks gestation were least likely to report being delivered by CD.

Over 40% of women who were 35 years of age or more, used assisted reproductive technology, delivered preterm or low birth weight infants, or who reported medical complications such as hypertension, gestational diabetes or placental problems were delivered by CD.

Adolescents under 20 years of age were most likely to deliver vaginally (81%).

\* includes only mothers ages 20 and above

## Reasons for Cesarean Delivery (CD)

The most common reason for a primary CD reported by women was that the induction failed (32%). Other leading causes for a primary CD were that the baby was in the wrong position (26%), fetal monitor indicated a problem with the baby (26%), and labor was too long (25%) (Table 2).

The most common reason for a repeat CD was that the surgery was scheduled (14%) and labor was dangerous (12%).

**Table 2. Reasons Reported for Primary and Repeat Cesarean Delivery, 2009-2011**

Factor	Primary	Repeat
Labor dangerous due to medical problem	16	12
Past due date*	8	<1
Induction failed*	32	4
Did not want vaginal delivery	4	7
C-section was scheduled*	4	14
Baby in wrong position*	26	8
Fetal monitor showed that baby was having problems during labor*	26	5
Provider thought baby was too big	17	10
Labor too long*	25	5

\*statistically significant,  $p < 0.05$

## Discussion

Approximately one-third of Maryland women who delivered a live birth reported that their infants were delivered by CD. Rates were highest among women who used assisted reproductive technology, experienced medical perinatal problems such as hypertension, diabetes, placental problems or preterm gestation. Forty-five percent of women who were 35 years of age or more at delivery reported having a CD.

Since 2000, an objective of the national Healthy People (HP) Program has been to reduce the cesarean delivery rate. The HP 2020 objective targets low risk women—those with a first pregnancy, singleton infant in vertex position, and term gestation.

Besides the baby being in the wrong position, the leading reasons reported by mothers for primary CD were failed inductions, fetal monitoring that indicated the baby was having problems, or length of labor. Many mothers request VBAC deliveries. Development of hospital clinical protocols for obstetric providers that better define when CD is necessary such as those recently released by the American College of Obstetricians and Gynecologists (ACOG) may help alleviate the high CD rate for these conditions.

Although CD can be life-saving for the mother and baby, it should be used with clear indications.

*“I wanted very much to avoid a cesarean birth—I feel that practitioners push cesarean births. I do not feel there is honesty in the assessment of “medically necessary” cesareans.”*

*“...was told from the beginning that I would have to have a repeat c-section for fear of rupturing my uterus and she was delivered 3 weeks early.”*

*“I had an emergency c-section because I had a seizure due to high blood pressure.”*

*“C-sections are not as good as vaginal births for the mother or the baby...”*

PRAMS mothers



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## PRAMS Methodology

Data included in this report were collected from the Pregnancy Risk Assessment Monitoring System (PRAMS), a surveillance system established by the Centers for Disease Control and Prevention (CDC) to obtain information about maternal behaviors and experiences that may be associated with adverse pregnancy outcomes.

In Maryland, the collection of PRAMS data is a collaborative effort of the Department of Health and Mental Hygiene and the CDC. Each month, a

sample of approximately 200 Maryland women who have recently delivered live born infants are surveyed by mail or by telephone, and responses are weighted to make the results representative of all Maryland births.

This report is based on the responses of 4,548 Maryland mothers who delivered live born infants between January 1, 2009 and December 31, 2011 and were surveyed two to nine months after delivery.

## Limitations of Report

This report presents only basic associations between maternal factors, cesarean delivery. Unexamined inter-relationships among variables are not described and could explain some of the findings in the report.

Maryland PRAMS data are retrospective and therefore subject to recall bias. They are also based on the mother's perception of events and may not be completely accurate.

## Resources

National Vital Statistics Reports, November 2014, Vol. 63 No 6. Trends in low-risk cesarean delivery in the United States 1990-2013.. U.S Department of Health and Human Services, Centers for Disease Control and Prevention.

American College of Obstetricians and Gynecologists. Safe Prevention of the Primary Cesarean Delivery. Obstetric Care Consensus No. 1. Obstetrics and Gynecology 2014;123:693-711.



Maryland Department of Health and Mental Hygiene  
Maternal and Child Health Bureau • Vital Statistics Administration

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