



# Risk Factors Associated With Having A Primary Cesarean Section in Georgia

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## Background

### Prevalence and Negative Health Effects

- In Georgia, the rate of low birth weight (LBW) births is higher than the national rate and has increased slightly in recent years to close to 10%. This high rate is a major public health concern.

### Gestational Hypertension

- Gestational Hypertension (GH), also referred to as pregnancy-induced hypertension, is a condition characterized by high blood pressure during pregnancy. GH can lead to a serious condition called preeclampsia.

### Hypertension Preeclampsia and Eclampsia

- Preeclampsia is high blood pressure during pregnancy and signs of damage to another organ system (most often liver and kidneys). Hypertension Eclampsia (HE) is preeclampsia with the inclusion of seizures.

## Objective

- Assess the risk factors associated with having a primary cesarean section in Georgia.

## Methods

### Data Source

This study utilized data from 2014 to 2015 Georgia Birth Certificates (n=262,109).

### Study Population

This study was conducted among live infants born between January 1, 2014 and December 31, 2015.

### Analytic Plan

Frequencies and percentages were used to describe the study population.

Bivariate analyses were conducted to estimate unadjusted odds ratios and 95% confidence intervals between risk factors and having a cesarean section.

Multivariable logistic regression models to estimate the adjusted odds ratios and 95% confidence intervals.

SAS 9.4 was used for analyses.

## Results

**Table 1.** Adjusted associations between select characteristics and having a cesarean section in Georgia: 2014 - 2015

Characteristics	Having a Cesarean Section	
	Adjusted Odds Ratio	95% Confidence Interval
<b>Race</b>		
White	REF	
Black	1.16	1.13-1.18
Multiracial	1.04	0.98-1.11
Other	0.97	0.92-1.01
<b>Insurance</b>		
Private, Non-government	REF	
Public, Government	0.90	0.88-0.92
Military	0.63	0.60-0.66
Self-pay	0.81	0.78-0.84
<b>Education</b>		
Less than high school	0.96	0.93-0.98
High school graduate	0.88	0.85-0.90
Some college	0.81	0.78-0.84
College graduate	REF	
<b>Gestational Hypertension (GH)</b>		
Yes	2.02	1.94-2.10
No	REF	
<b>Eclampsia</b>		
Yes	3.62	2.87-4.58
No	REF	
<b>Prenatal Care</b>		
Inadequate	REF	2.87-4.58
Intermediate	0.96	0.92-1.00
Adequate	1.17	1.14-1.20

## Key Findings

The prevalence of having a primary cesarean section was 21.75%.

Women with HE versus without HE were: 3.62 times more likely to have a cesarean section.

Women with GH versus without GH were: 2.02 times more likely to have a cesarean section.

Women with eclampsia versus without eclampsia were: 3.62 times more likely to have a cesarean section.

Women with adequate prenatal care versus inadequate prenatal care were: 1.17 times more likely to have a cesarean section.

## Discussion/Conclusion

There are statistically significant associations between race, insurance type, education, HE, GH, eclampsia, and prenatal care on having a primary cesarean section in Georgia.

**Strengths:** Birth certificates represent the only source of representative data by which to analyze rare events or conduct detailed subgroup analyses of birth outcomes.

**Limitations:** Errors are common in birth certificate data and the reported data do not always accurately reflect the underlying variables of interest.

## Acknowledgments

We would like to thank the University of Georgia College of Public Health Epidemiology and Biostatistics Department.

We would also like to thank the Practice Research and Mentorship in Epidemiology (PRIME) Workgroup and Center for Undergraduate Research Opportunities.

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## Background

Severe maternal morbidity (SMM) includes unexpected outcomes of labor and delivery that may result in significant adverse outcomes in pregnant women.

SMM is a precursor for maternal mortality (MM) and Georgia has had one of the highest rates of MM and its prevalence has steadily increased.

## Objective

Investigate the prevalence of SMM in Georgia and identify potential risk factors.

## Methods

### Data Source

This study utilized data from 2014 to 2015 Georgia Birth Certificates (n=262,109).

### Study Population

This study was conducted among live infants born between January 1, 2014 and December 31, 2015.

### Analytic Plan

Frequencies and percentages were used to describe the study population.

Bivariate analyses were conducted to estimate unadjusted odds ratios and 95% confidence intervals between risk factors and SMM.

Multivariable logistic regression models to estimate the adjusted odds ratios and 95% confidence intervals.

SAS 9.4 was used for analyses.

## Results

**Table 1.** Adjusted associations between select characteristics and experiencing a SMM in Georgia: 2014 - 2015

Characteristics	Having a Cesarean Section	
	Adjusted Odds Ratio	95% Confidence Interval
<b>Race</b>		
White	REF	
Black	1.10	1.03-1.19
Multiracial	1.03	0.84-1.27
Other	1.40	1.21-1.62
<b>Insurance</b>		
Private, Non-government	REF	
Public, Government	1.31	1.20-1.44
Military	0.88	0.72-1.08
Self-pay	3.45	3.11-3.83
<b>Education</b>		
Less than high school	0.80	0.72-0.88
High school graduate	0.77	0.70-0.85
Some college	0.83	0.74-0.93
College graduate	REF	
<b>Hypertension Eclampsia (HE)</b>		
Yes	3.16	1.93-5.17
No	REF	
<b>Gestational Hypertension (GH)</b>		
Yes	1.59	1.41-1.80
No	REF	
<b>Previous Cesarean Section</b>		
Yes	0.85	0.77-0.94
No	REF	
<b>Prenatal Care</b>		
Inadequate	REF	
Intermediate	1.20	1.05-1.37
Adequate	1.16	1.06-1.27

## Key Findings

- A total of 6,829 (2.65%) mothers met the case definition of SMM.
- Women with HE versus without HE were: 3.16 times more likely to experience a SMM.
- Women with GH versus without GH were: 1.59 times more likely to experience a SMM.
- Women with intermediate prenatal care versus inadequate prenatal care were: 1.20 times more likely to experience a SMM.
- Women with adequate prenatal care versus inadequate prenatal care were: 1.16 times more likely to experience a SMM.

## Discussion/Conclusion

There are statistically significant associations between race, insurance type, education, HE, GH, having a previous cesarean section, and prenatal care on experiencing a SMM.

**Strengths:** Birth certificates represent the only source of representative data by which to analyze rare events or conduct detailed subgroup analyses of birth outcomes.

**Limitations:** Errors are common in birth certificate data and the reported data do not always accurately reflect the underlying variables of interest.

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