

INFANT MORTALITY RATE AND PRETERM BIRTH ANALYSIS

DESIGNED BY

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EXECUTIVE SUMMARY

Introduction

This report determines whether differences exist in infant mortality rate (IMR) and preterm birth rate between Black Non-Hispanic mothers and White Non-Hispanic mothers in Delaware when stratified by age, education status, and health coverage of the mother at the time of delivery.

Methods

Ten years (1996-2005) of data from the Delaware birth cohort dataset was analyzed into three conditions: whether or not a mother experienced at least one infant death, whether or not a mother experienced at least one preterm birth at less than 32 weeks of gestation, and whether or not a mother experienced at least one preterm birth between 32 and 36 weeks of gestation. The dataset was then stratified based on mother's age at delivery, educational attainment of the mother at time of delivery, and health coverage of the mother at time of delivery. Comparisons between these racial categories within each stratified group, or substrata, were then made using two proportions statistical tests and analyzed using several comparisons of two proportions statistical tests.

Results

Statistically significant differences in IMR between Black Non-Hispanic mothers and White Non-Hispanic mothers generally occurred in more highly educated, non-teenage mothers regardless of health coverage. Moreover, statistically significant differences in preterm birth rate between these racial categories generally occurred in more highly educated mothers regardless of health coverage. Overall, education reduced the IMR and preterm birth rates of White Non-Hispanic mothers compared to Black Non-Hispanic mothers. As for health coverage, it was difficult to find any trend between whether or not any significant racial disparities took place for both IMR and preterm birth analyses. With that said, statistically significant racial disparities were found in the overwhelming majority of Medicaid and Private Insurance substrata.

Conclusions

These results are not uncommon as demonstrated by related studies in other states and nationwide. Like other investigations, this study showed that disparities in IMR between African Americans and Whites actually increased with higher education levels and that higher educational status does not reduce IMR in African-Americans like it does among Whites. Moreover, the fact that statistically significant racial disparities exist in the many of the Medicaid and Private Insurance substrata likely means that neither of these health care systems has a pronounced effect on reducing racial disparities. Finally, despite recognition that education and health care coverage serve as essential factors in understanding the racial disparities in IMR and preterm birth, subsequent investigations should be conducted using other demographic, health-related, and risk factors.

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METHODOLOGY

Figure 1 outlines the conceptual framework of the methodology. From the birth cohort dataset supplied by the Delaware Health Statistics Center, only data entries (i.e., births) that met the following criteria were extracted:

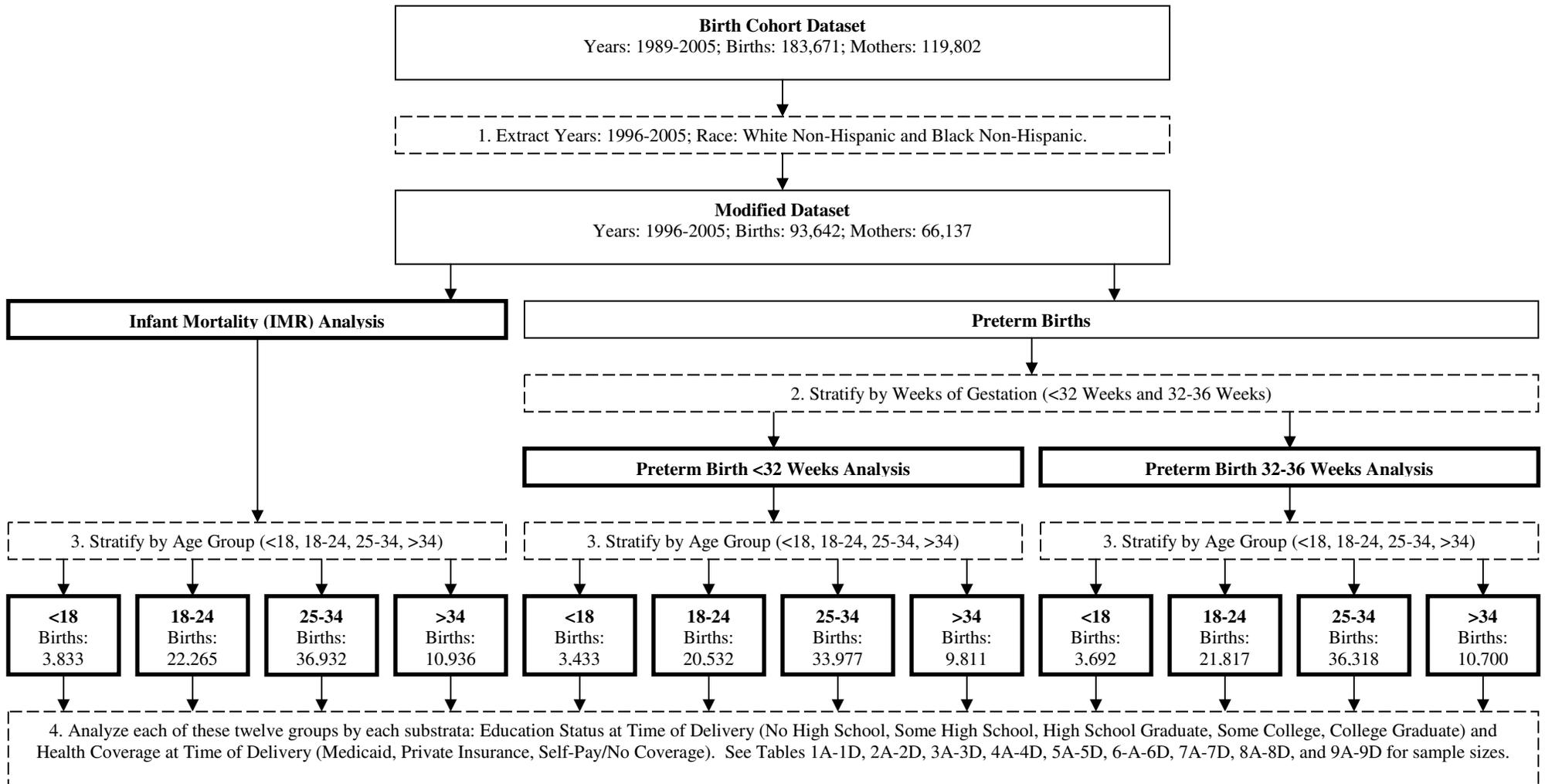
1. Birth during the period between 1996 and 2005.
2. Race of the mother is White or Black.
3. Ethnicity of the mother is not Hispanic.

This modified dataset was then applied to three different conditions: IMR, preterm births at less than 32 weeks of gestation, and preterm births between 32 and 36 weeks of gestation. For the IMR analysis, mothers in the modified dataset who had at least one infant death (numerator) and all other mothers in the modified dataset (denominator) were analyzed. For both preterm births analyses, mothers in the modified dataset who had at least one infant born preterm (numerator; in one analysis, preterm at less than 32 weeks; in the other analysis, preterm between 32 and 36 weeks) and all other mothers (denominator) in the modified dataset were analyzed. In all three analyses, no duplicate entries were permitted.

Since this report focuses on the differences *between* the two racial categories and not differences *among* these factors within each racial category, the data was stratified rather than adjusted by one or more factors. Accordingly, the mothers in the modified dataset were stratified by the following age strata based on their age at delivery: less than 18 years of age; 18-24 years of age; 25-34 years of age; and over 34 years of age. Because mothers in the dataset may have completed multiple pregnancies throughout this period, mothers could be located in multiple age strata. The mothers were then matched to their education status and health coverage status at the time of delivery. An analysis of these added stratifications, or substrata, was then performed.

To test for significance, a comparison of two proportions (z-test) was performed for each statistical analysis. All analysis was carried out in Microsoft Access and Microsoft Excel.

Figure 1: IMR/Preterm Birth Analysis Methodology



INFANT MORTALITY RATE RESULTS

IMR Stratified by Age Only

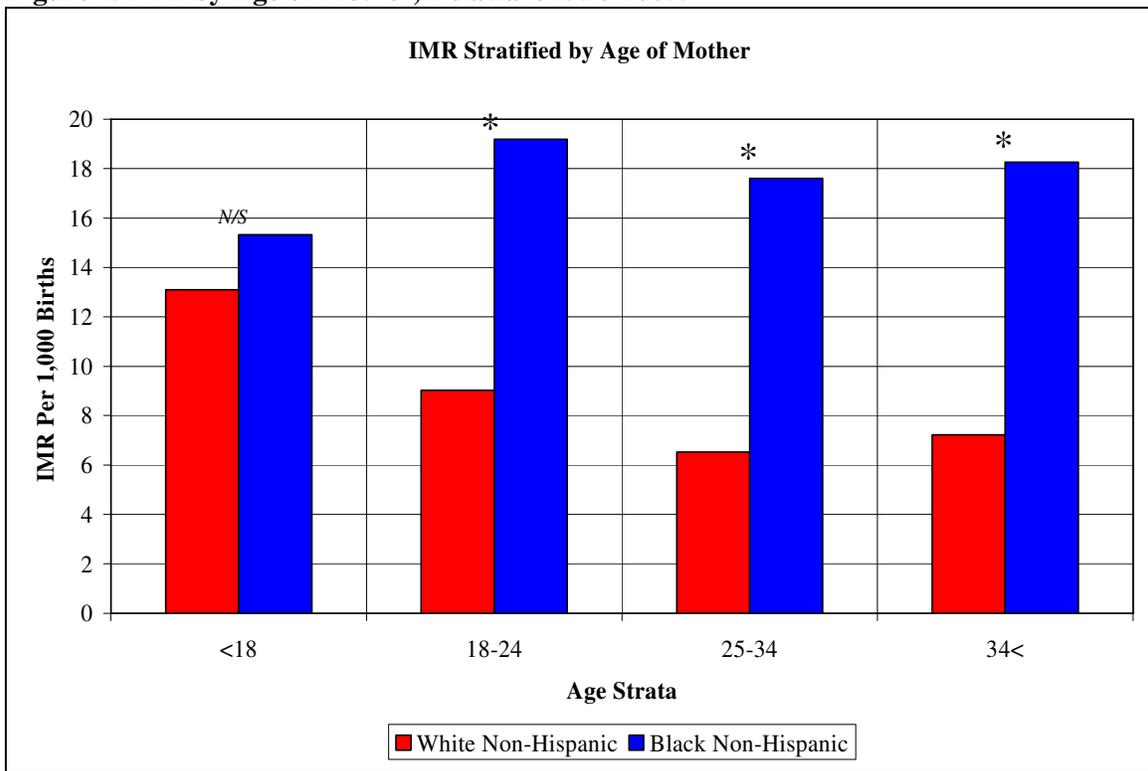
As shown in **Table 1**, the difference in IMR between Black Non-Hispanic mothers and White Non-Hispanic mothers is statistically significant at every age strata except for mothers under 18 years of age.

Table 1. Significance Table of IMR Stratified by Age Only ($\alpha = 0.05$)				
	Under 18	18-24	25-34	Over 34
IMR	No	Yes	Yes	Yes

In addition, the IMR for Black Non-Hispanic mothers is higher than the IMR for White Non-Hispanic mothers for every age strata as displayed in

Figure 2.

Figure 2. IMR by Age of Mother, Delaware 1996-2005.



Tables 1A-1D in the **Appendix** show the underlying data and statistical test results.

IMR Stratified by Age and Education

Table 2 presents whether a statistically significant difference in IMR occurred between Black Non-Hispanic mothers and White Non-Hispanic mothers when stratified by both age and education status. Stratification by education status results in certain age substrata between the racial groups to not be statistically significant from one another. For example, although **Table 1** suggests a statistically

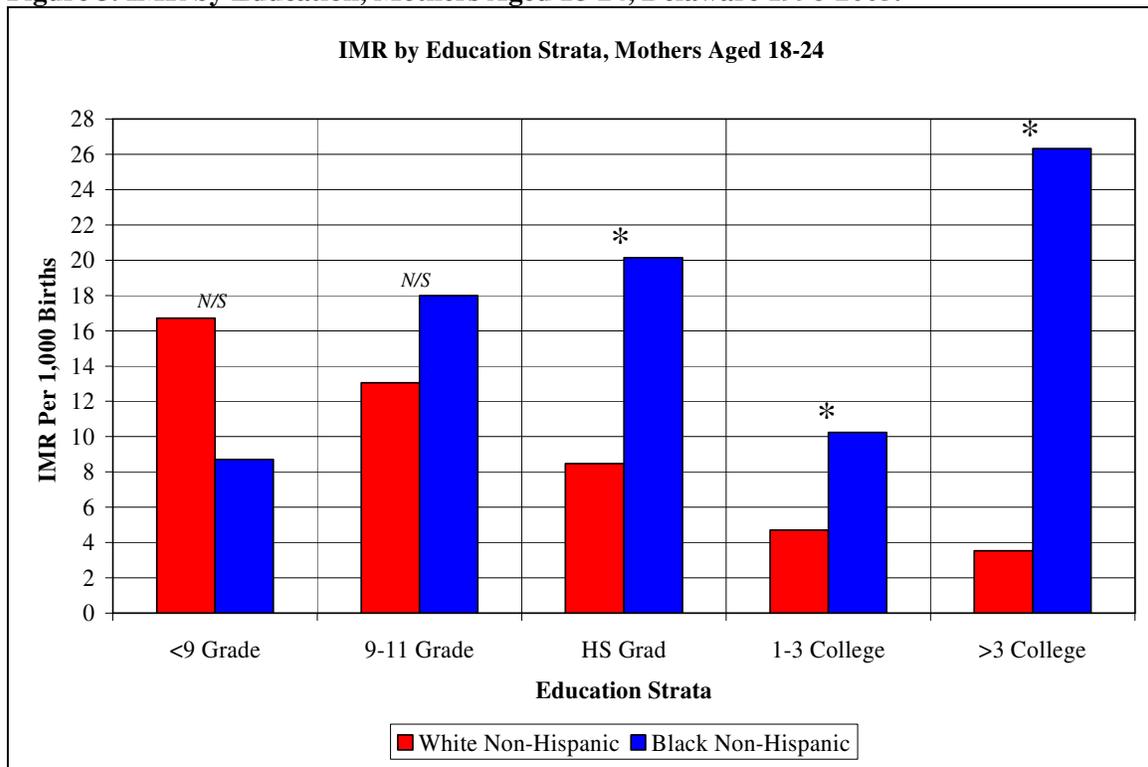
significant difference in IMR between Black Non-Hispanic mothers and White Non-Hispanic mothers for the age strata 18-24, **Table 2** shows that this statistical significance only arises in the substrata of mothers who have at least graduated from high school. This trend tends to occur in the other statistically significant age strata, ages 25-34 and Over 34.

Table 2. Significance Table of IMR Stratified by Age and Education Status ($\alpha = 0.05$)				
	Under 18	18-24	25-34	Over 34
Less Than HS	No	No	No	N/A
Some HS	No	No	No	No
HS Graduate	No	Yes	Yes	No
1-3 Years College	N/A*	Yes	Yes	Yes
>3 Years College	N/A	Yes	Yes	Yes

These results indicate that the difference in IMR between Black Non-Hispanic mothers and White Non-Hispanic mothers is statistically significant in generally both higher age and education substrata.

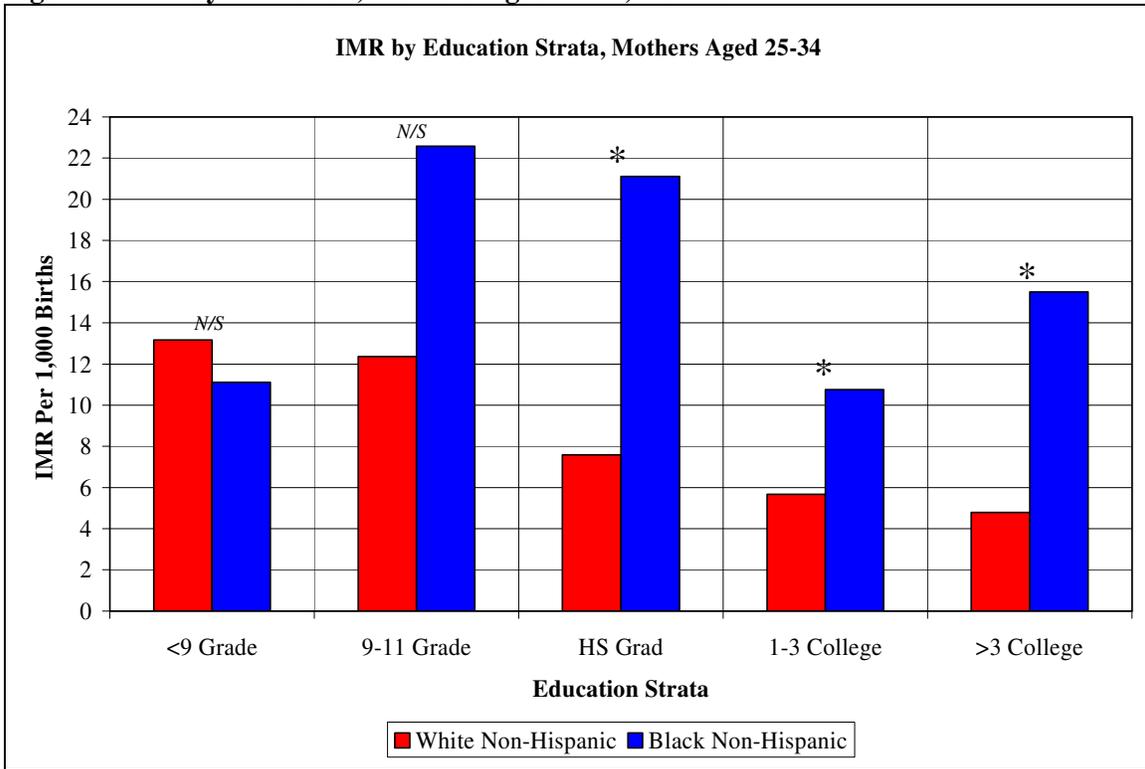
Figure 3 presents the IMR by education strata for mothers aged 18 to 24 and **Figure 4** presents the IMR by education strata for mothers aged 25-34.

Figure 3. IMR by Education, Mothers Aged 18-24, Delaware 1996-2005.



* Any cell labeled “N/A” indicates a test for significance cannot be calculated because of a low sample size. This is not surprising given the small number of mothers under 18 years of age who have had at least some college education and over 34 years of age who have had less than a high school education.

Figure 4. IMR by Education, Mothers Aged 25-34, Delaware 1996-2005.



In both figures, the IMR for White Non-Hispanic mothers noticeably decreases at increasing education levels whereas the IMR for Black Non-Hispanic mothers does not. Moreover, in each of these statistically significant age and education substrata, the IMR for Black Non-Hispanic mothers is higher than the IMR for White Non-Hispanic mothers. **Tables 2A-2D[†]** in the **Appendix** display the corresponding data for and statistical test results for each education strata.

IMR Stratified by Age and Health Coverage

Table 3 illustrates whether a statistically significant difference in IMR exists between Black Non-Hispanic mothers and White Non-Hispanic mothers when stratified by age and health coverage status.

	Under 18	18-24	25-34	Over 34
Medicaid	No	Yes	Yes	No
Insurance	No	Yes	Yes	Yes

Although **Table 1** states a significant difference in IMR between Black Non-Hispanic mothers and White Non-Hispanic mothers for the age strata Over 34, **Table 3** reveals that this significance is mitigated in the

[†] Note that some of the data in these tables have a count of 5 or less. Accordingly, caution should be exercised when interpreting the significance tests associated with this data.

substrata of mothers who have Medicaid at the time of delivery. Finally, according to the proportions listed in **Tables 3A-3D** in the **Appendix**, the IMR for Black Non-Hispanic mothers is higher than that of White Non-Hispanic mothers in each of the statistically significant age and health coverage substrata.

PRETERM BIRTH <32 WEEKS RESULTS

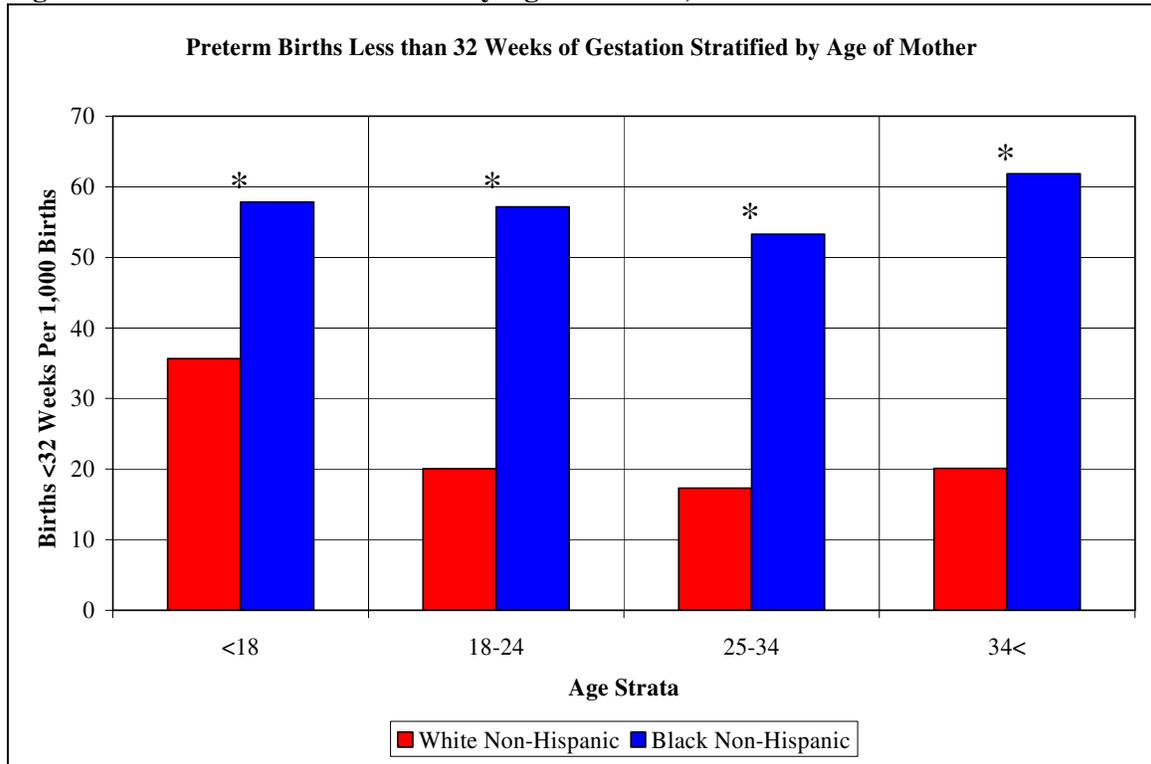
Preterm Birth <32 Weeks Stratified by Age Only

Table 4 displays the difference in rates for preterm births occurring at less than 32 weeks of gestation between Black Non-Hispanic mothers and White Non-Hispanic mothers.

Table 4. Significance Table of Preterm Births <32 Weeks Stratified by Age Only ($\alpha = 0.05$)				
	Under 18	18-24	25-34	Over 34
Preterm Birth <32 Weeks	Yes	Yes	Yes	Yes

According to **Table 4**, the difference in preterm birth rates is statistically significant at every age strata. Furthermore, as exhibited in **Figure 5**, the preterm birth rate for Black Non-Hispanic mothers is consistently higher than for White Non-Hispanic mothers.

Figure 5. Preterm Births <32 Weeks by Age of Mother, Delaware 1996-2005.



Tables 4A-4D in the **Appendix** display the corresponding data and statistical test results.

Preterm Birth <32 Weeks Stratified by Age and Education

Table 5 exhibits whether a statistically significant difference in the rate of preterm births at less than 32 weeks of gestation occurs between the racial categories when stratified by age and education status. As noted before, stratifying by education status results in certain age category substrata to not be statistically significant. Although **Table 4** shows a statistically significant difference in preterm birth rates between Black Non-Hispanic mothers and White Non-Hispanic mothers for the age strata 18-24, **Table 5** reveals that this significance only surfaces in the substrata of mothers who have at least attended high school.

Table 5. Significance Table of Preterm Births <32 Weeks Stratified by Age and Education Status ($\alpha = 0.05$)				
	Under 18	18-24	25-34	Over 34
Less Than HS	No	No	No	No
Some HS	Yes	Yes	Yes	No
HS Graduate	No	Yes	Yes	Yes
1-3 Years College	N/A	Yes	Yes	Yes
>3 Years College	N/A	Yes	Yes	Yes

The difference in preterm birth rates between Black Non-Hispanic mothers and White Non-Hispanic mothers is statistically significant in generally both higher age and education substrata.

Figure 6 presents the preterm birth rates at less than 32 weeks of gestation by education strata for mothers aged 18-24.

Figure 6. Preterm Births <32 Weeks by Education, Mothers Aged 18-24, Delaware 1996-2005.

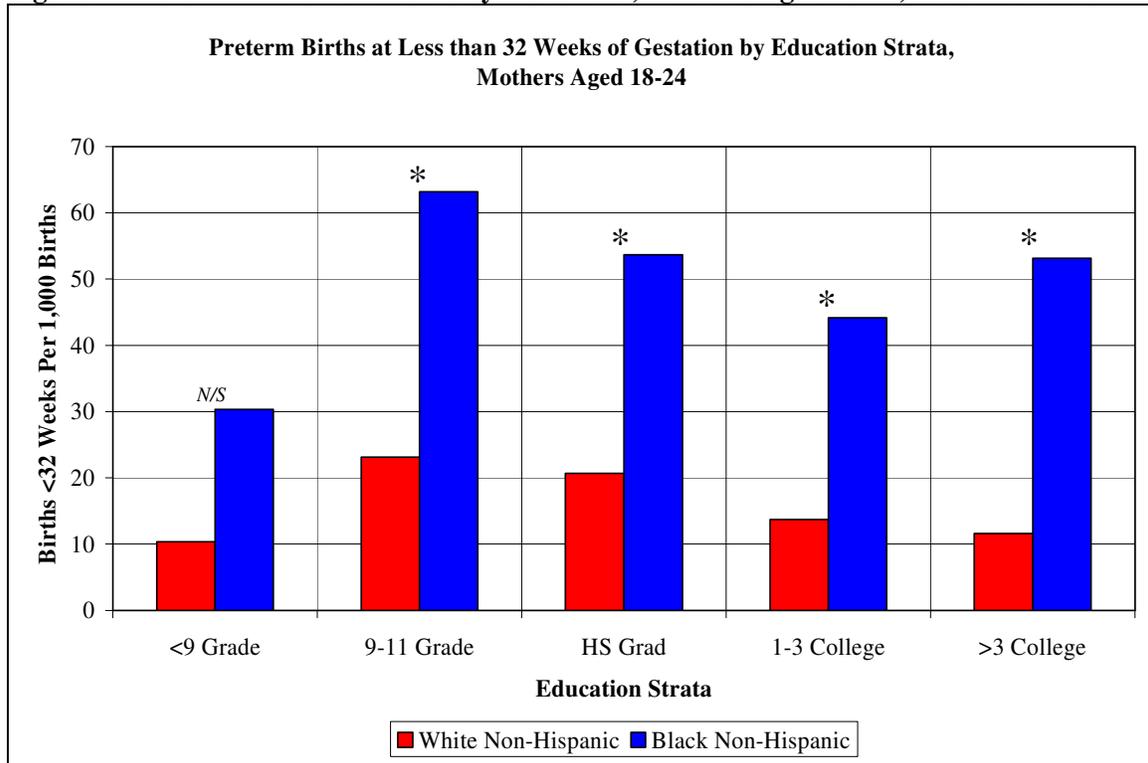
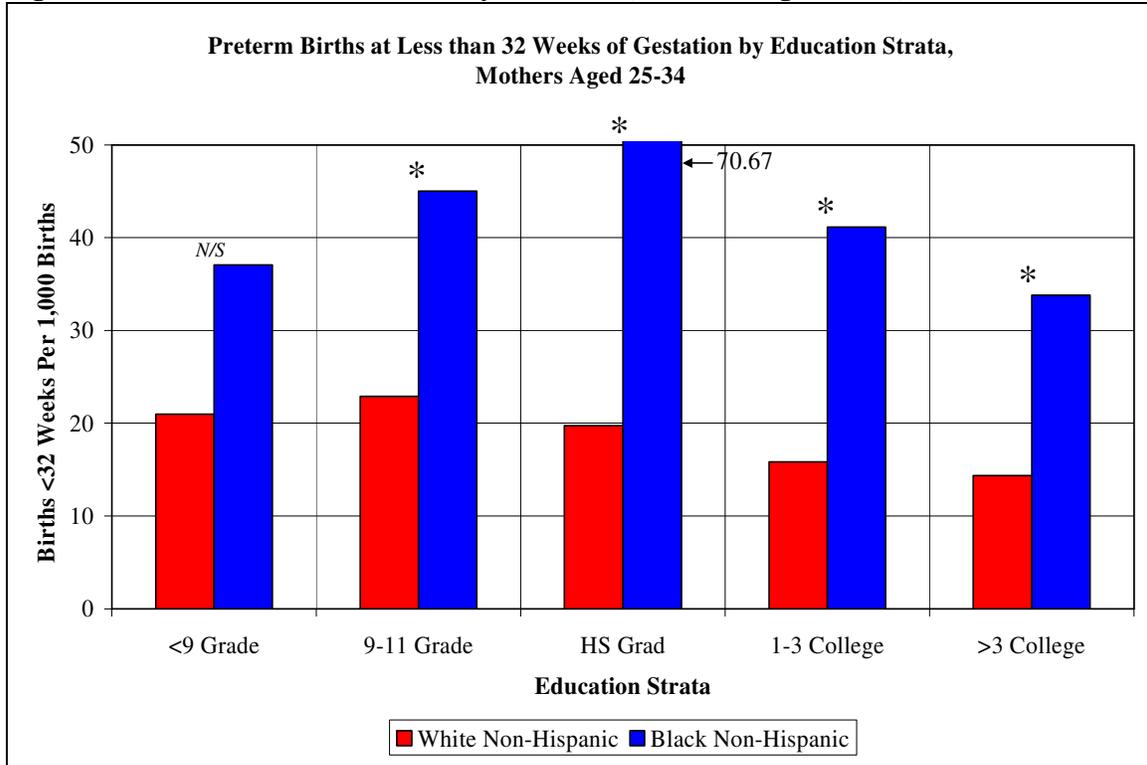


Figure 7 presents the preterm births rates at less than 32 weeks of gestation by education strata for mothers aged 25-34.

Figure 7. Preterm Births <32 Weeks by Education, Mothers Aged 25-34, Delaware 1996-2005.



As shown in these figures, the preterm birth rate for White Non-Hispanic mothers generally decreases at increasing education levels and does not for Black Non-Hispanic mothers. Moreover, in each of the statistically significant age and education substrata, the preterm birth rate at less than 32 weeks of gestation for Black Non-Hispanic mothers is higher than for White Non-Hispanic mothers. Tables 5A-5D[†] in the Appendix provide the data and statistical test results for each education strata.

Preterm Births <32 Weeks Stratified by Age and Health Coverage

Table 6 displays whether a statistically significant difference in the rate of preterm births at less than 32 weeks of gestation exists between Black Non-Hispanic mothers and White Non-Hispanic mothers when stratified by both age and health coverage status.

	Under 18	18-24	25-34	Over 34
Medicaid	Yes	Yes	Yes	Yes
Insurance	No	Yes	Yes	Yes

Although **Table 4** indicates a statistically significant difference in preterm birth rates at less than 32 weeks between Black Non-Hispanic mothers and White Non-Hispanic mothers for the age strata Under 18, **Table 6** reveals that statistical significance is not met in the substrata of mothers under 18 who have Private Insurance at the time of delivery. Furthermore, as shown in **Tables 6A-6D** in the **Appendix**, the preterm birth rate at less than 32 weeks for Black Non-Hispanic mothers is higher than for White Non-Hispanic mothers in each of the statistically significant age and health coverage substrata.

PRETERM BIRTH 32-36 WEEKS RESULTS

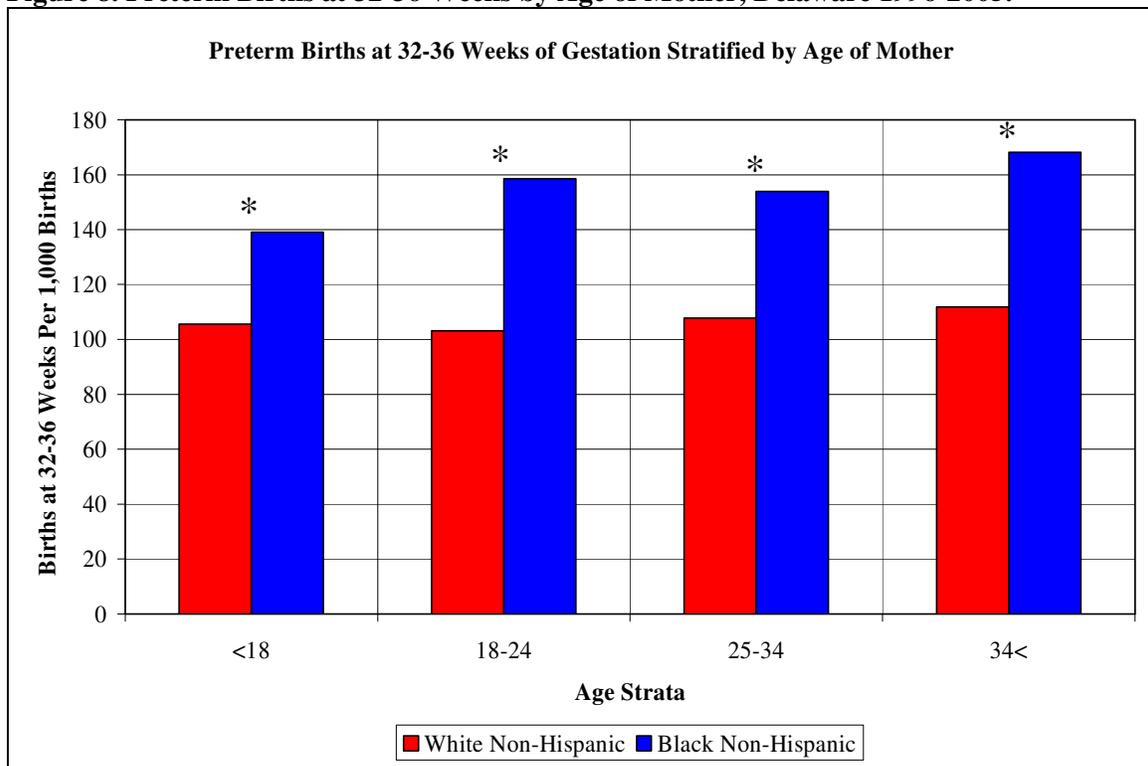
Preterm Birth 32-36 Weeks Stratified by Age Only

Table 7 provides the difference in rates for preterm births taking place between 32 and 36 weeks of gestation between Black Non-Hispanic mothers and White Non-Hispanic mothers.

Table 7. Significance Table of Preterm Births 32-36 Weeks Stratified by Age Only ($\alpha = 0.05$)				
	Under 18	18-24	25-34	Over 34
Preterm Birth 32-36 Weeks	Yes	Yes	Yes	Yes

Note that the difference in rates is statistically significant across the table. Moreover, the rates for Black Non-Hispanic mothers are higher than for White Non-Hispanic mothers at every age strata (**Figure 8**).

Figure 8. Preterm Births at 32-36 Weeks by Age of Mother, Delaware 1996-2005.



Tables 7A-7D in the Appendix display the resultant data and statistical test results.

Preterm Birth 32-36 Weeks Stratified by Age and Education

Table 8 displays whether a statistically significant difference in the rate of preterm births between 32 and 36 weeks of gestation occurs between Black Non-Hispanic mothers and White Non-Hispanic mothers when stratified by both age and education status. As previously noted, adding this stratification by education status results in certain age category substrata to not be statistically significant. Although Table 7 shows a statistically significant difference in preterm birth rates between Black Non-Hispanic mothers and White Non-Hispanic mothers for the age strata 25-34, Table 8 reveals that this statistical significance only surfaces in the substrata of mothers who have at least attended high school.

Table 8. Significance Table of Preterm Births 32-36 Weeks by Age and Education Status ($\alpha = 0.05$)				
	Under 18	18-24	25-34	Over 34
Less Than HS	No	No	No	Yes
Some HS	Yes	Yes	Yes	Yes
HS Graduate	No	Yes	Yes	Yes
1-3 Years College	N/A	Yes	Yes	No
>3 Years College	N/A	No	Yes	No

Figure 9 shows the preterm births between 32 and 36 weeks by education strata for mothers aged 18-24.

Figure 9. Preterm Births at 32-36 Weeks by Education, Mothers Aged 18-24, Delaware 1996-2005.

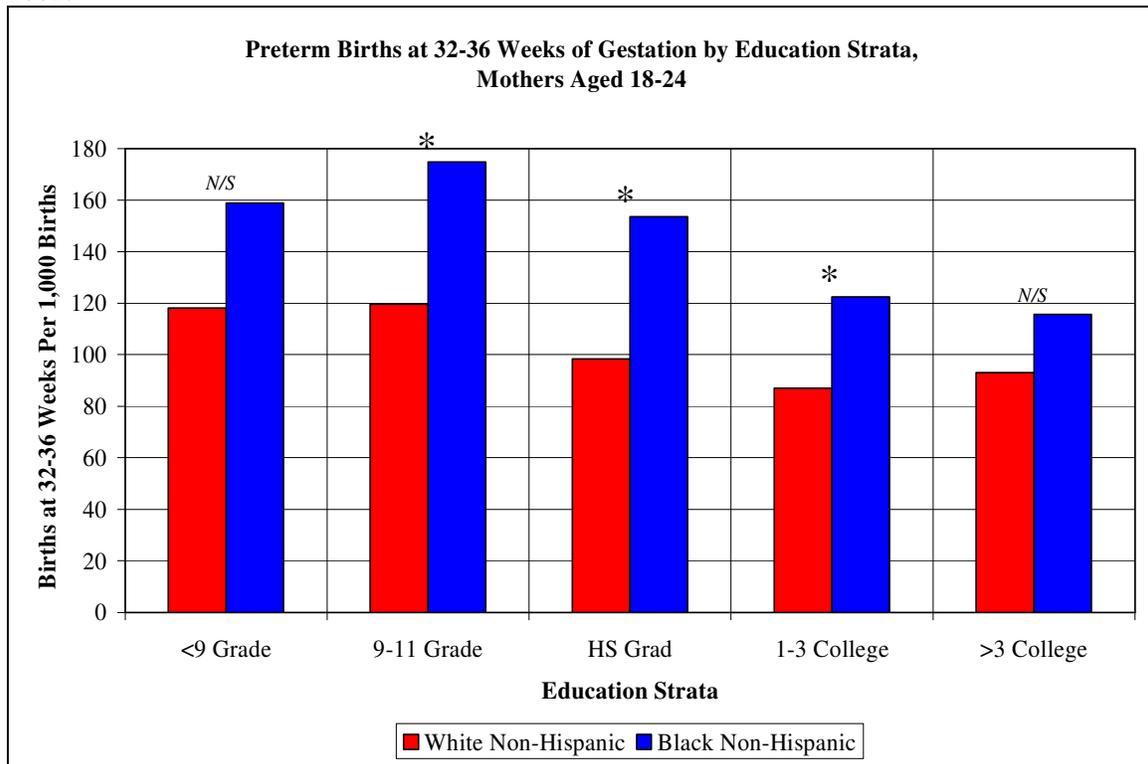
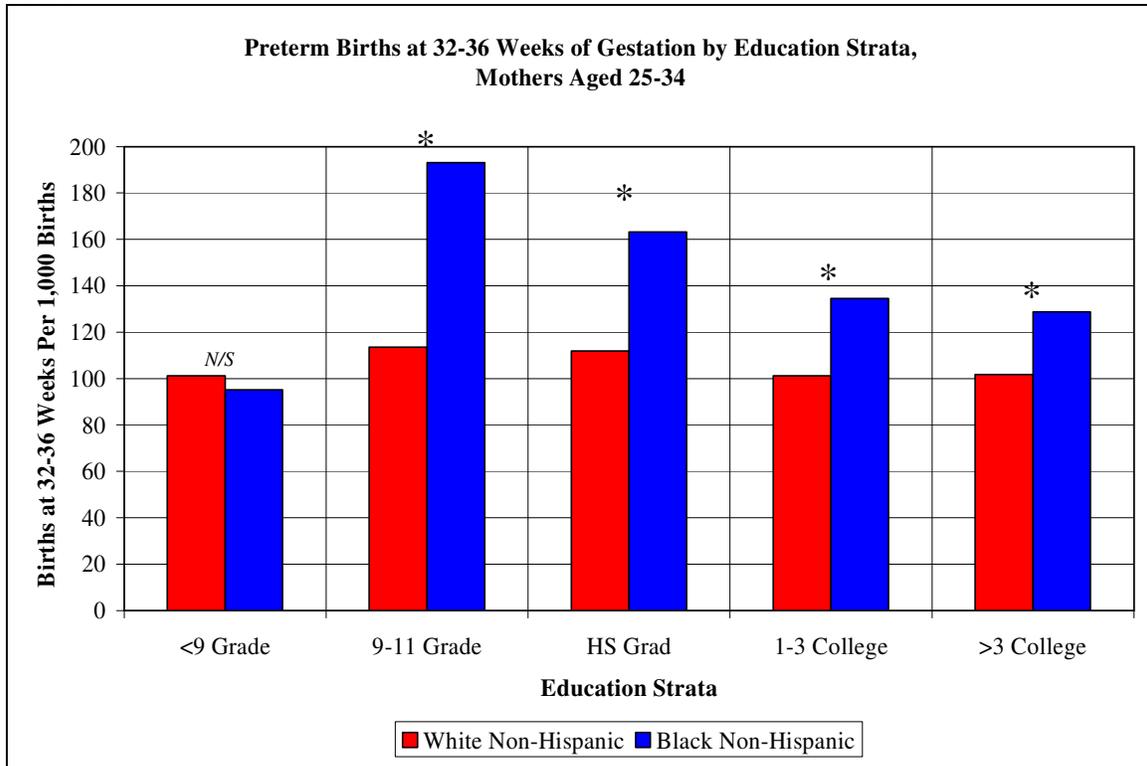


Figure 10 shows the preterm births between 32 and 36 weeks by education strata for mothers aged 25-34.

Figure 10. Preterm Births at 32-36 Weeks by Education, Mothers Aged 25-34, Delaware 1996-2005.



In both figures, the preterm birth rate for both racial categories tends to decrease at higher education levels. Tables 8A-8D[†] in the Appendix provide the corresponding data and statistical test results for each education strata.

Preterm Births 32-36 Weeks Stratified by Age and Health Coverage

Table 9 presents whether a statistically significant difference in the rate of preterm births between 32 and 36 weeks of gestation exists between Black Non-Hispanic mothers and White Non-Hispanic mothers when stratified by both the age and health coverage status of the mother at the time of delivery.

	Under 18	18-24	25-34	Over 34
Medicaid	Yes	Yes	Yes	Yes
Insurance	No	Yes	Yes	Yes

Although **Table 7** suggests a statistically significant difference in preterm birth rates between Black Non-Hispanic mothers and White Non-Hispanic mothers for the age strata Under 18, **Table 9** shows that this statistical significance does not take place in the substrata of mothers who have Private Insurance at the time of delivery. In addition, the preterm birth rate for Black Non-Hispanic mothers is higher than the rate for White Non-Hispanic mothers in each of the statistically significant age and health coverage substrata according to the proportions listed in **Tables 9A-9D** in the **Appendix**.

DISCUSSION

This report attempts to uncover whether any racial disparities exist in IMR and preterm birth rate for Black Non-Hispanic mothers and White Non-Hispanic mothers when stratified by factors such as age, education, and health coverage status. Statistically significant differences in IMR between Black Non-Hispanics and White Non-Hispanics occur when mothers were 18 years of age and older at the time of delivery and when education status was added, in mothers who generally had at least graduated from high school as well. In both preterm birth analyses, statistically significant differences in preterm birth rates between Black Non-Hispanic mothers and White Non-Hispanic mothers exist for mothers at every age level and especially for mothers who had at least some high school education. For both IMR and preterm birth analyses, it was difficult to find any trend between whether or not any significant racial disparities took place and the type of health coverage. However, in every analysis that generated statistically significant results, the IMR and preterm birth rates for Black Non-Hispanic mothers were consistently higher than the rates for White Non-Hispanic mothers.

Nationwide, disorders associated with preterm birth (less than 37 weeks) and its correlate, low birth weight, represent the leading cause of death for Black Non-Hispanic infants whereas congenital malformations serve as the primary cause of death for White Non-Hispanic infants.^{1,2} In Delaware, preterm birth and low birth weight are the leading cause of death for both Black Non-Hispanic and White Non-Hispanic infants.³ Consequently, the reduction of preterm birth serves as an essential goal in reducing infant mortality both for the State of Delaware and the United States overall. This report illustrates that increasing education levels are generally associated with lower preterm birth rates and IMR in White Non-Hispanics mothers (**Figure 3, Figure 4, Figure 6, Figure 7, Figure 9, and Figure 10**). However, in Black Non-Hispanic mothers, only preterm birth rates at 32 to 36 weeks of gestation tend to decrease with increasing education (**Figure 9 and Figure 10**). By and large, statistically significant differences in IMR and preterm birth rates are present between the two racial categories even when mothers are stratified by education status. This is true for mothers in the age range who may not have yet finished their education (age strata 18-24) as well as for mothers in the age range who have generally completed their overall education (age strata 25-34).

These results are not atypical. A similar study conducted in Georgia by Sung *et al* also revealed that IMR is higher in Blacks than in Whites even when maternal age and education are taken into consideration.⁴ Furthermore, when Din-Dzietham and Hertz-Picciotto comprehensively analyzed the North Carolina Linked Birth and Infant Death File, they found that IMR among African-Americans as compared to

Whites increases with higher levels of maternal education and that higher educational status does not reduce IMR in African-Americans like it does among Whites.^{5,6} Applying national-level data, Singh and Yu concluded that disparities in IMR between African Americans and Whites increased with higher education levels.⁷ Likewise, several studies also indicated that preterm birth and low birth weight is higher in Black Non-Hispanics compared to White Non-Hispanics when maternal education status is controlled.^{2,8,9} Furthermore, racial disparities in preterm birth rate is documented as actually widening with increased maternal education.^{2,10}

Unlike the analysis for maternal education status, it was difficult to elucidate trends for racial disparities in IMR and preterm births when mothers are stratified by both age and health coverage status. In the IMR analysis, statistically significant racial disparities exist for every health coverage substrata with the exception of mothers over 34 years of age with Medicaid at the time of delivery (**Table 3**). However, in both preterm birth analyses, statistically significant racial disparities occur for every health coverage substrata with the exception of mothers less than 18 years of age with Private Insurance at the time of delivery (**Table 6** and **Table 9**). The reasons for this discrepancy need to be investigated further.

The fact that statistically significant racial disparities exist in the overwhelming majority of Medicaid and Private Insurance substrata likely means that neither of these health care systems has any effect on reducing racial disparities. In Delaware, African-American women as compared to White women are twice as likely to lack first trimester prenatal care; moreover, disparities in care – such as receipt of antenatal steroids and cesarean section – is documented at Christiana Hospital.^{11,12} The issue may be disparities in health care practice rather than disparities in health care coverage.

Schempf *et al* state that elimination of the racial disparity in Delaware would reduce the total IMR by more than 20 percent.¹¹ Knowing this, the importance of addressing racial disparities in the maternal and child health realm cannot be understated. Despite recognition that education and health care coverage serve as essential factors in understanding this racial disparity, additional investigation on other demographic, health-related, and risk factors will still need to be performed.

END TEXT

APPENDIX

Table 1A. IMR with Age at Pregnancy: Under 18					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	22	33	0.58	0.564	No
Population (n)	1680	2153			
Proportion (X/n)	0.013	0.015			

Table 1B. IMR with Age at Pregnancy: Between 18-24					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	122	168	6.53	0.000	Yes
Population (n)	13510	8755			
Proportion (X/n)	0.009	0.019			

Table 1C. IMR with Age at Pregnancy: Between 25-34					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	189	140	9.32	0.000	Yes
Population (n)	28982	7950			
Proportion (X/n)	0.007	0.018			

Table 1D. IMR with Age at Pregnancy: Over 34					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	64	38	4.71	0.000	Yes
Population (n)	8856	2080			
Proportion (X/n)	0.007	0.018			

Table 2A. IMR, Education Status with Age at Pregnancy: Under 18					
IMR <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	4	7	0.29	0.775	No
Population (n)	223	327			
Proportion (X/n)	0.018	0.021			
IMR 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	14	22	0.60	0.551	No
Population (n)	1294	1661			
Proportion (X/n)	0.011	0.013			
IMR HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	4	3	0.79	0.431	No
Population (n)	166	224			
Proportion (X/n)	0.024	0.013			
IMR 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	0	0	#DIV/0!	#DIV/0!	#DIV/0!
Population (n)	1	2			
Proportion (X/n)	0.000	0.000			
IMR >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	0	0	#DIV/0!	#DIV/0!	#DIV/0!
Population (n)	0	2			
Proportion (X/n)	#DIV/0!	0.000			

Table 2B. IMR, Education Status with Age at Pregnancy: Between 18-24					
IMR <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	7	1	0.63	0.531	No
Population (n)	419	115			
Proportion (X/n)	0.017	0.009			
IMR 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	35	43	1.43	0.154	No
Population (n)	2680	2389			
Proportion (X/n)	0.013	0.018			
IMR HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	61	95	5.48	0.000	Yes
Population (n)	7196	4716			
Proportion (X/n)	0.008	0.020			
IMR 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	14	19	2.27	0.023	Yes
Population (n)	2980	1857			
Proportion (X/n)	0.005	0.010			
IMR >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	3	10	3.61	0.000	Yes
Population (n)	851	380			
Proportion (X/n)	0.004	0.026			

Table 2C. IMR, Education Status with Age at Pregnancy: Between 25-34					
IMR <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	6	1	0.16	0.875	No
Population (n)	456	90			
Proportion (X/n)	0.013	0.011			
IMR 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	13	17	1.67	0.095	No
Population (n)	1051	753			
Proportion (X/n)	0.012	0.023			
IMR HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	67	70	6.29	0.000	Yes
Population (n)	8829	3314			
Proportion (X/n)	0.008	0.021			
IMR 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	41	24	2.55	0.011	Yes
Population (n)	7238	2231			
Proportion (X/n)	0.006	0.011			
IMR >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	60	29	5.52	0.000	Yes
Population (n)	12549	1872			
Proportion (X/n)	0.005	0.015			

Table 2D. IMR, Education Status with Age at Pregnancy: Over 34

IMR <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	0	0	#DIV/0!	#DIV/0!	#DIV/0!
Population (n)	112	32			
Proportion (X/n)	0.000	0.000			
IMR 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	4	2	0.22	0.828	No
Population (n)	191	115			
Proportion (X/n)	0.021	0.017			
IMR HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	19	11	1.58	0.115	No
Population (n)	2307	743			
Proportion (X/n)	0.008	0.015			
IMR 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	11	14	3.94	0.000	Yes
Population (n)	1896	567			
Proportion (X/n)	0.006	0.025			
IMR >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	29	10	2.43	0.015	Yes
Population (n)	4445	649			
Proportion (X/n)	0.007	0.015			

Table 3A. IMR, Health Coverage Status with Age at Pregnancy: Under 18					
IMR MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	12	21	0.20	0.838	No
Population (n)	979	1592			
Proportion (X/n)	0.012	0.013			
IMR INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	10	10	-0.65	0.514	No
Population (n)	667	500			
Proportion (X/n)	0.015	0.020			

Table 3B. IMR, Health Coverage Status with Age at Pregnancy: Between 18-24					
IMR MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	75	116	3.56	0.000	Yes
Population (n)	7153	6586			
Proportion (X/n)	0.010	0.018			
IMR INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	38	36	4.31	0.000	Yes
Population (n)	6597	2392			
Proportion (X/n)	0.006	0.015			

Table 3C. IMR, Health Coverage Status with Age at Pregnancy: Between 25-34					
IMR MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	42	65	3.03	0.002	Yes
Population (n)	4143	3564			
Proportion (X/n)	0.010	0.018			
IMR INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	136	66	7.00	0.000	Yes
Population (n)	24744	4400			
Proportion (X/n)	0.005	0.015			

Table 3D. IMR, Health Coverage Status with Age at Pregnancy: Over 34					
IMR MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	6	8	0.94	0.347	No
Population (n)	831	672			
Proportion (X/n)	0.007	0.012			
IMR INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	52	29	5.34	0.000	Yes
Population (n)	7907	1376			
Proportion (X/n)	0.007	0.021			

Table 4A. Preterm Births <32 Weeks with Age at Pregnancy: Under 18					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	54	111	3.02	0.003	Yes
Population (n)	1514	1919			
Proportion (X/n)	0.036	0.058			

Table 4B. Preterm Births <32 Weeks with Age at Pregnancy: Between 18-24					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	252	456	14.19	0.000	Yes
Population (n)	12551	7981			
Proportion (X/n)	0.020	0.057			

Table 4C. Preterm Births <32 Weeks with Age at Pregnancy: Between 25-34					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	466	377	17.30	0.000	Yes
Population (n)	26900	7077			
Proportion (X/n)	0.017	0.053			

Table 4D. Preterm Births <32 Weeks with Age at Pregnancy: Over 34					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	161	111	9.74	0.000	Yes
Population (n)	8016	1795			
Proportion (X/n)	0.020	0.062			

Table 5A. Preterm Births <32 Weeks, Education Status with Age at Pregnancy: Under 18

PRETERM <32 WEEKS <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	9	16	0.46	0.645	No
Population (n)	198	292			
Proportion (X/n)	0.045	0.055			
PRETERM <32 WEEKS 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	40	82	2.65	0.008	Yes
Population (n)	1168	1461			
Proportion (X/n)	0.034	0.056			
PRETERM <32 WEEKS HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	4	12	1.54	0.123	No
Population (n)	152	196			
Proportion (X/n)	0.026	0.061			
PRETERM <32 WEEKS 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	0	0	#DIV/0!	#DIV/0!	#DIV/0!
Population (n)	1	2			
Proportion (X/n)	0.000	0.000			
PRETERM <32 WEEKS >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	0	0	#DIV/0!	#DIV/0!	#DIV/0!
Population (n)	0	2			
Proportion (X/n)	#DIV/0!	0.000			

Table 5B. Preterm Births <32 Weeks, Education Status with Age at Pregnancy: Between 18-24					
PRETERM <32 WEEKS <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	4	3	1.48	0.138	No
Population (n)	386	99			
Proportion (X/n)	0.010	0.030			
PRETERM <32 WEEKS 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	57	136	6.78	0.000	Yes
Population (n)	2463	2153			
Proportion (X/n)	0.023	0.063			
PRETERM <32 WEEKS HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	138	227	9.32	0.000	Yes
Population (n)	6669	4230			
Proportion (X/n)	0.021	0.054			
PRETERM <32 WEEKS 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	38	74	6.28	0.000	Yes
Population (n)	2774	1676			
Proportion (X/n)	0.014	0.044			
PRETERM <32 WEEKS >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	9	18	4.15	0.000	Yes
Population (n)	776	339			
Proportion (X/n)	0.012	0.053			

Table 5C. Preterm Births <32 Weeks, Education Status with Age at Pregnancy: Between 25-34

PRETERM <32 WEEKS <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	9	3	0.87	0.382	No
Population (n)	429	81			
Proportion (X/n)	0.021	0.037			
PRETERM <32 WEEKS 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	22	29	2.48	0.013	Yes
Population (n)	961	644			
Proportion (X/n)	0.023	0.045			
PRETERM <32 WEEKS HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	159	205	13.13	0.000	Yes
Population (n)	8058	2901			
Proportion (X/n)	0.020	0.071			
PRETERM <32 WEEKS 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	106	82	6.82	0.000	Yes
Population (n)	6693	1993			
Proportion (X/n)	0.016	0.041			
PRETERM <32 WEEKS >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	168	57	5.81	0.000	Yes
Population (n)	11700	1686			
Proportion (X/n)	0.014	0.034			

Table 5D. Preterm Births <32 Weeks, Education Status with Age at Pregnancy: Over 34					
PRETERM <32 WEEKS <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	1	1	1.10	0.270	No
Population (n)	104	25			
Proportion (X/n)	0.010	0.040			
PRETERM <32 WEEKS 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	7	8	1.53	0.125	No
Population (n)	171	92			
Proportion (X/n)	0.041	0.087			
PRETERM <32 WEEKS HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	54	38	4.24	0.000	Yes
Population (n)	2059	616			
Proportion (X/n)	0.026	0.062			
PRETERM <32 WEEKS 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	25	35	6.64	0.000	Yes
Population (n)	1692	501			
Proportion (X/n)	0.015	0.070			
PRETERM <32 WEEKS >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	71	27	4.57	0.000	Yes
Population (n)	4061	578			
Proportion (X/n)	0.017	0.047			

Table 6A. Preterm Births <32 Weeks, Health Coverage Status with Age at Pregnancy: Under 18					
PRETERM <32 WEEKS MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	26	78	2.90	0.004	Yes
Population (n)	887	1417			
Proportion (X/n)	0.029	0.055			
PRETERM <32 WEEKS INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	28	26	0.81	0.417	No
Population (n)	598	448			
Proportion (X/n)	0.047	0.058			

Table 6B. Preterm Births <32 Weeks, Health Coverage Status with Age at Pregnancy: Between 18-24					
PRETERM <32 WEEKS MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	137	318	9.77	0.000	Yes
Population (n)	6615	5969			
Proportion (X/n)	0.021	0.053			
PRETERM <32 WEEKS INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	100	107	8.53	0.000	Yes
Population (n)	6090	2142			
Proportion (X/n)	0.016	0.050			

Table 6C. Preterm Births <32 Weeks, Health Coverage Status with Age at Pregnancy: Between 25-34					
PRETERM <32 WEEKS MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	92	169	6.45	0.000	Yes
Population (n)	3760	3108			
Proportion (X/n)	0.024	0.054			
PRETERM <32 WEEKS INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	357	193	13.66	0.000	Yes
Population (n)	22996	3957			
Proportion (X/n)	0.016	0.049			

Table 6D. Preterm Births <32 Weeks, Health Coverage Status with Age at Pregnancy: Over 34					
PRETERM <32 WEEKS MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	24	32	2.12	0.034	Yes
Population (n)	719	552			
Proportion (X/n)	0.033	0.058			
PRETERM <32 WEEKS INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	129	78	9.67	0.000	Yes
Population (n)	7185	1207			
Proportion (X/n)	0.018	0.065			

Table 7A. Preterm Births 32-36 Weeks with Age at Pregnancy: Under 18					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	172	287	3.07	0.002	Yes
Population (n)	1629	2063			
Proportion (X/n)	0.106	0.139			

Table 7B. Preterm Births 32-36 Weeks with Age at Pregnancy: Between 18-24					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	1376	1344	12.07	0.000	Yes
Population (n)	13339	8478			
Proportion (X/n)	0.103	0.159			

Table 7C. Preterm Births 32-36 Weeks with Age at Pregnancy: Between 25-34					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	3088	1180	11.16	0.000	Yes
Population (n)	28655	7663			
Proportion (X/n)	0.108	0.154			

Table 7D. Preterm Births 32-36 Weeks with Age at Pregnancy: Over 34					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	975	334	6.91	0.000	Yes
Population (n)	8714	1986			
Proportion (X/n)	0.112	0.168			

Table 8A. Preterm Births 32-36 Weeks, Education Status with Age at Pregnancy: Under 18					
PRETERM 32-36 WEEKS <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	25	37	0.23	0.819	No
Population (n)	215	301			
Proportion (X/n)	0.116	0.123			
PRETERM 32-36 WEEKS 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	132	221	2.77	0.006	Yes
Population (n)	1256	1583			
Proportion (X/n)	0.105	0.140			
PRETERM 32-36 WEEKS HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	14	28	1.40	0.161	No
Population (n)	162	211			
Proportion (X/n)	0.086	0.133			
PRETERM 32-36 WEEKS 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	0	0	#DIV/0!	#DIV/0!	#DIV/0!
Population (n)	1	2			
Proportion (X/n)	0.000	0.000			
PRETERM 32-36 WEEKS >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	0	0	#DIV/0!	#DIV/0!	#DIV/0!
Population (n)	0	1			
Proportion (X/n)	#DIV/0!	0.000			

Table 8B. Preterm Births 32-36 Weeks, Education Status with Age at Pregnancy: Between 18-24					
PRETERM 32-36 WEEKS <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	49	17	1.13	0.257	No
Population (n)	415	107			
Proportion (X/n)	0.118	0.159			
PRETERM 32-36 WEEKS 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	313	393	5.45	0.000	Yes
Population (n)	2617	2249			
Proportion (X/n)	0.120	0.175			
PRETERM 32-36 WEEKS HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	694	690	8.90	0.000	Yes
Population (n)	7057	4495			
Proportion (X/n)	0.098	0.154			
PRETERM 32-36 WEEKS 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	255	217	3.92	0.000	Yes
Population (n)	2931	1773			
Proportion (X/n)	0.087	0.122			
PRETERM 32-36 WEEKS >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	78	42	1.20	0.230	No
Population (n)	838	363			
Proportion (X/n)	0.093	0.116			

Table 8C. Preterm Births 32-36 Weeks, Education Status with Age at Pregnancy: Between 25-34					
PRETERM 32-36 WEEKS <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	45	8	0.16	0.869	No
Population (n)	445	84			
Proportion (X/n)	0.101	0.095			
PRETERM 32-36 WEEKS 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	116	139	4.63	0.000	Yes
Population (n)	1022	720			
Proportion (X/n)	0.114	0.193			
PRETERM 32-36 WEEKS HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	968	509	7.43	0.000	Yes
Population (n)	8659	3119			
Proportion (X/n)	0.112	0.163			
PRETERM 32-36 WEEKS 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	717	288	4.34	0.000	Yes
Population (n)	7087	2141			
Proportion (X/n)	0.101	0.135			
PRETERM 32-36 WEEKS >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	1260	234	3.50	0.000	Yes
Population (n)	12381	1817			
Proportion (X/n)	0.102	0.129			

Table 8D. Preterm Births 32-36 Weeks, Education Status with Age at Pregnancy: Over 34					
PRETERM 32-36 WEEKS <9 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	7	7	2.69	0.007	Yes
Population (n)	111	31			
Proportion (X/n)	0.063	0.226			
PRETERM 32-36 WEEKS 9-11 GRADE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	22	25	2.49	0.013	Yes
Population (n)	183	108			
Proportion (X/n)	0.120	0.231			
PRETERM 32-36 WEEKS HIGH SCHOOL GRADUATE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	271	142	5.38	0.000	Yes
Population (n)	2250	707			
Proportion (X/n)	0.120	0.201			
PRETERM 32-36 WEEKS 1-3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	222	74	1.32	0.188	No
Population (n)	1872	529			
Proportion (X/n)	0.119	0.140			
PRETERM 32-36 WEEKS >3 YEARS COLLEGE EDUCATION					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	456	80	1.83	0.068	No
Population (n)	4375	623			
Proportion (X/n)	0.104	0.128			

Table 9A. Preterm Births 32-36 Weeks, Health Coverage Status with Age at Pregnancy: Under 18					
PRETERM 32-36 WEEKS MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	95	216	3.05	0.002	Yes
Population (n)	954	1530			
Proportion (X/n)	0.100	0.141			
PRETERM 32-36 WEEKS INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	70	57	0.52	0.602	No
Population (n)	638	476			
Proportion (X/n)	0.110	0.120			

Table 9B. Preterm Births 32-36 Weeks, Health Coverage Status with Age at Pregnancy: Between 18-24					
PRETERM 32-36 WEEKS MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	745	1019	9.28	0.000	Yes
Population (n)	7011	6341			
Proportion (X/n)	0.106	0.161			
PRETERM 32-36 WEEKS INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	587	302	5.67	0.000	Yes
Population (n)	6457	2275			
Proportion (X/n)	0.091	0.133			

Table 9C. Preterm Births 32-36 Weeks, Health Coverage Status with Age at Pregnancy: Between 25-34					
PRETERM 32-36 WEEKS MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	485	592	6.54	0.000	Yes
Population (n)	4049	3419			
Proportion (X/n)	0.120	0.173			
PRETERM 32-36 WEEKS INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	2561	558	5.29	0.000	Yes
Population (n)	24446	4220			
Proportion (X/n)	0.105	0.132			

Table 9D. Preterm Births 32-36 Weeks, Health Coverage Status with Age at Pregnancy: Over 34					
PRETERM 32-36 WEEKS MEDICAID					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	125	131	2.48	0.013	Yes
Population (n)	807	639			
Proportion (X/n)	0.155	0.205			
PRETERM 32-36 WEEKS INSURANCE					
	White	Black	Z	p-value	Significant (a = 0.05)
Sample Size (X)	833	194	4.42	0.000	Yes
Population (n)	7789	1304			
Proportion (X/n)	0.107	0.149			

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