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Socioeconomic Determinants of Infant Mortality Rate Disparities

Alex Krasikov
Clemson University, alexkrasikov@hotmail.com

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Alex Krasikov
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Dr. Michael Maloney
Dr. Raymond Sauer

Abstract

This study examines variation in infant mortality rate (IMR) between black and white populations. Data were drawn from CDC Birth Cohort Linked Birth Infant Data for 2004. Author examined numerous socioeconomic factors that could explain the gap in IMR between two races. Each potential factor was examined separately before introducing into a complete model. The proposed model explains about 11 percentage points in difference between groups, and showed factors that can be affected by change in public policy, play statistically significant role in IMR disparity. We can look at the IMR as a socioeconomic indicator that highlights both negative and positive developments in society.

Keywords: infant mortality rate, racial disparities, socioeconomic factors

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I want to thank Dr. Thomas Mroz for supporting and guiding my research and helping me with my paper. Dr. Maloney for giving me a chance. Dr. Dougan and Dr. Templeton for being great dedicated teachers. And to all of you for teaching me the value of economic research

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Introduction

"No indicator captures the divergence in human development opportunity more powerfully than child mortality"[1]

Infant mortality rate or IMR is the number of newborns dying under a year of age divided by the number of live births that year. The infant mortality rate is also called the infant death rate. It is the number of deaths that occur in the first year of life for 1000 live births[2].

In the past, infant mortality claimed a considerable percentage of children born, but the rate declined significantly, mainly due to improvements in basic health care, advances in the medical field and the introduction of prenatal care. Infant mortality rate is commonly included as a part of standard of living evaluations in economics[3]

The IMR is a useful indicator of a country's level of health or development, and is a component of the physical quality of life index. But the method of calculating IMR often varies widely between countries based on the way they define a live birth and how many premature infants are born in the country. The World Health Organization (WHO) defines a live birth as any born human being who demonstrates independent signs of life, including breathing, voluntary muscle movement, or heartbeat. Many countries, however, including certain European states and Japan, only count as live births cases where an infant breathes at birth, which makes their reported IMR numbers somewhat lower and raises their rates of perinatal mortality. The exclusion of any high-risk infants from the denominator or numerator in reported IMRs can be problematic for comparisons. Many countries, including the United States, Sweden or Germany, count an infant exhibiting any sign of life as alive, no matter the month of gestation or the size, but according to United States Center for Disease Control researchers[4], some other countries differ in these practices. All of the countries named adopted the WHO definitions in the late 1980s or early 1990s[5], which are used throughout the European Union.

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[1] United Nations, Human Development Report 2005 (New York: UNDP, 2005), p. 4

[2] Definition of Infant mortality Rate, MedTerms.com, MedicineNet.com, http://www.medterms.com/script/main/art.asp?articlekey=3967

[3] Arthur Sullivan; Steven M. Sheffrin (2003). Economics: Principles in action. Upper Saddle River, New Jersey 07458: Pearson Prentice Hall. ISBN 0-13-063085-3

[4] Bill Hendrick (2009-11-04). "Preemies Raise U.S. Infant Mortality Rate". WebMD. http://www.webmd.com/baby/news/20091103/preemies-raise-us-infant-mortality-rate

[5] Gabriel Duc, "The crucial role of definition in perinatal epidemiology," Social and Preventive Medicine, Vol. 40, No. 6, November 1995

My research centered on two US major groups: African Americans and Caucasians[6]. I want to explain significant gap in infant mortality rate between two groups in terms of socioeconomic factors. Unlike health factors, socioeconomic factors can be affected through the appropriate public policy.[7] My study shows that some factors have an influence on one group and almost insignificant for another. If policy maker could take into account those differences we could allocate resources more efficiently, reducing disparity between groups and achieving lower IMR in U.S.

Literature review

In his study of IMR in large urban areas Sims et al. (2007)[8] revealed that high poverty was significantly associated with minority–white IMR disparities. Findings from this study suggested that the factors associated with infant mortality in urban areas vary by race and ethnicity.

Almond et al. (2008)[9] showed that rolling out food stamps program during 1960s early 1970s helped improved birth outcomes for both whites and African Americans, with larger impacts for births to African American mothers.

Singh and Kogan (2007)[10] analyzed vital records data between 1969 and 2001, and revealed that relative socioeconomic disparities in infant mortality, increased substantially since 1985. Improvements in infant mortality would be substantial if infants in the lower socioeconomic status groups experienced mortality rates similar to those of the highest status group. The key risk factors include: smoking during pregnancy, delayed or no prenatal care, and lack of health care coverage.

[6] To simplify notation, further in paper African Americans identified as blacks and Caucasians identified as whites.
[7] Health factors well known medical conditions such as lower birthweight and shorter gestational period related to mother and child health. Finding or confirming these factors goes beyond of proposed paper, and remedy usually lies in healthcare advancements.
[8] Mario Sims, Tammy Sims, Marino Bruce, Journal of NMA, Apr 2007, 349-56 Urban Poverty and Infant Mortality Rate Disparities available at www.nmanet.org/images/uploads/Publications/OC349.pdf
[9] Almond, Hoynes, Schanzenbach NBER Working Paper No. 14306, Sept. 2008, Inside the War on Poverty: The Impact of Food Stamps on Birth Outcomes. Available at www.econ.ucdavis.edu/faculty/hoynes/working_papers/FSP_infants.pdf
[10] Gopal Singh, Michael Kogan, Pediatrics Vol. 119 No. 4 April 2007, pp. e928-e939 Persistent Socioeconomic Disparities in Infant, Neonatal, and Postneonatal Mortality Rates in the United States, 1969–2001 Available at http://pediatrics.aappublications.org/cgi/content/full/119/4/e928

Farley et al. (2006)[11] in his work showed that after controlling for individual level socio-demographic factors, median household income was positively associated with both birthweight-for-gestational-age and gestational age at birth.

Sohler et al. (2003) looked for possible association between income inequality and IMR in New York City. He showed that an increase of one standard deviation in income inequality was associated with an increase of 0.8 in IMR.[12] Investigating economic inequality among 10 richest nations between 1903 and 2003 Leigh and Jencks (2006)[13] found that income share of the top 10% of population is negatively related to life expectancy and positively related to infant mortality.

Sims and Rainge (2002)[14] in their study of white and black mothers in Milwaukee found that black infant neonatal mortality rates were twice those of whites, while postneonatal mortality rates were three times that of whites. All black mothers were nearly eight times as likely as all white mothers to have inadequate prenatal care, whereas poor black mothers were three times as likely to have inadequate prenatal care as were poor white mothers.

In 2009, the US Center for Disease Control and Prevention (CDC) issued a report which stated that the American rates of infant mortality were affected by the United States' high rates of premature babies compared to European countries and which highlights the differences in reporting requirements between the United States and Europe. France, the Czech Republic, Ireland, the Netherlands, and Poland do not report all live births of babies under 500 g and/or 22 weeks of gestation. However, the report also concludes that the differences in reporting are unlikely to be the primary explanation for the United States' relatively low international ranking.[15]

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[11] Farley, Mason, Rice, Habel Pediatric and Perinatal Epidemiology 2006 May; 20(3):188-200 The relationship between the neighborhood environment and adverse birth outcomes

[12] Sohler, Arno, Chang, Fang and Clyde Schechter Journal of Urban Health Volume 80, Number 4, Dec 2003, 650-657 Income inequality and infant mortality in New York City

[13] Andrew Leigh and Christopher Jencks, Journal of Health Economics 26 (2007) 1–24 Inequality and mortality: Long-run evidence from a panel of countries. http://people.anu.edu.au/andrew.leigh/pdf/InequalityMortality.pdf

[14] Mario Sims and Yolanda Rainge, Journal of National Med. Assoc. 2002 June; 94(6): 472–479, Urban poverty and infant-health disparities among African Americans and whites in Milwaukee

[15] Marian F. MacDorman, Ph.D., and T.J. Mathews, M.S., CDC, "Behind International Rankings of Infant Mortality: How the United States Compares with Europe". http://www.cdc.gov/nchs/data/databriefs/db23.htm

Datasets

In the paper I primarily focus on individual level data. I also use county level of data in an auxiliary role to get further insight and test a few hypotheses, where individual level does not provide relevant information. Statistical package Stata[16] was used to analyze the dataset.

Individual Level Dataset is available for public use by Center for Disease Control and Prevention. For this study I use latest available for Birth Cohort Linked Birth/Infant Data for 2004[17]. The dataset has 4,118,956 records for all births occurred in 2004 in U.S. with 27,763 deaths of infants born in the same year[18]. There are 3,839,003 records of mothers who reported their race as Black or White with corresponding 26,278 deaths. Unfortunately, dataset does not have poverty level, income or insurance coverage for individual records. I tried to pick-up some correlation of income from education level of the mother, and county poverty level.

County level datasets were taken from U.S Census Bureau's County and City Data Book[19]. I used datasets for 2004, 2005 to match periods with my individual level data. After extracting and tabulating county datasets I merged them with my primary, individual level, dataset.

To help me explore the data, I created list of my own variables. Most of variables created are dummy group variables. They serve to define and combine individual records into groups. Group categories include race, age, residence, level of education attained; trimester of prenatal care began, etc. Grouping helped to look at the data from perspective of public policy maker where groups could be treated as separate homogeneous entities. For example we could look only at black mothers with education level less than high-school from age 22 to 25, who started prenatal care in the third trimester.

Another reason for grouping is that dataset uses two different revisions (1989 and 2003 Revisions) of the U.S. Standard Certificate of Live Birth and Certificate of Death. Seven states implemented the revised certificate by January 1, 2004 and two during 2004. Comparable revised data was combined with data from the remaining states and the DC.

[16] StataCorp LP, www.stata.com, In the paper I use Stata version 10.1
[17] CDC NCHS, Division of Vital Statistics, 2004 Birth Cohort Linked Birth/Infant, Death Data Set, Dataset and Guide Available at http://www.cdc.gov/nchs/data_access/Vitalstatsonline.htm
[18] Non-residents were excluded or 65 occurrences
[19] U.S. Census Bureau, County and City Data Book http://www.census.gov/statab/ccdb/ccdbstcounty.html

Groups were defined in such way that created group variables did not distort underlying information and made groups fully compatible and inclusive for both the unrevised and the revised version of certificates. As time goes on more states will switch to revised version, but as long as some states continue to use the unrevised version, such grouping will provide relevant information for all states, with no need to do separate data analysis for 'revised' and 'unrevised' states.

In 2004 infant mortality rate for blacks and whites was 6.84 per 1000, with significant disparity between two groups. While whites IMR was 5.63, blacks IMR was 13.19. Average age of mother was 27.34 and was slightly higher for white mothers 27.67 compare to black mothers 25.58. Infants from white mothers accounted for 84% of the sample and remainder 16% were black. In 69.5% cases white mothers reported of being married compare to only 31.2%. In the sample 21.8% had less than high school education, 29.5% high school education, and 47.4% more than high school. 79.9% started prenatal care in first trimester (70.1% of blacks and 81.7 of whites), 13.5% started in second trimester (19.2% of blacks and 12.3% of whites) and 2.85% started in third trimester (4.4% of blacks and 2.5% of whites). 1.067% didn't use prenatal care (2.025% of blacks and 0.883% of whites). 10.87% smoked during the pregnancy (11.45% of whites and 8.05% of blacks). Neonatal mortality rate was 4.55 per 1000 births and postneonatal mortality rate 2.29 per 1000 births. Summary statistics for variables I use in the paper listed below[20].

Table 1.1 Summary Statistics

Variable	Mean	Std. Dev.	Min	Max	Observations
Outcome per 1000 birth	6.845006	82.45092	0	1000	
IMR per 1000 blacks	13.18835	114.0808	0	1000	616074
IMR per 1000 whites	5.632454	74.83803	0	1000	3222929
Mother's age	27.3396	6.18754	12	50	
Mother age, black	25.58799	6.235583	12	50	616074
Mother age, white	27.67443	6.12	12	50	3222929
Black Mother	.1604776	.3670485	0	1	
White Mother	.8395224	.3670485	0	1	
Married	.6333918	.4818783	0	1	
Married blacks	.3118521	.4632502	0	1	616074
Married whites	.6948552	.4604688	0	1	3222929
Age 11 to 16	.0167723	.1284174	0	1	
Age 17 to 18	.047957	.2136753	0	1	
Age 19 to 21	.1373148	.3441794	0	1	

[20] State residence dummy variables are not listed

Table 1.1 Summary Statistics (continue)

Variable	Mean	Std. Dev.	Min	Max	Observations
Age 22 to 25	.2154617	.4111423	0	1	
Age 26 to 30	.2641756	.4408933	0	1	
Age 31 to 35	.2123202	.4089504	0	1	
Age 36 to 40	.0897262	.2857891	0	1	
Age 41 to 55	.0155309	.1236513	0	1	
Age 46 or older	.0007413	.0272174	0	1	
Less than High School	.2179839	.4128765	0	1	
Less than High School, Blacks	.2442223	.4296255	0	1	616074
Less than High School, Whites	.2129684	.4094056	0	1	3222929
High School	.2945684	.4558486	0	1	
High School, blacks	.3706535	.4829802	0	1	616074
High School, whites	.2800245	.4490109	0	1	3222929
More than High School	.4744328	.499346	0	1	
More than High School, blacks	.368222	.4823224	0	1	616074
More than High School, whites	.4947354	.4999724	0	1	3222929
Prenatal Care from 1st trimester	.7987876	.4009065	0	1	
Prenatal Care from 1st tri., blacks	.7014498	.4576225	0	1	616074
Prenatal Care from 1st tri., whites	.8173941	.3863432	0	1	3222929
Prenatal Care from 2nd trimester	.134661	.3413612	0	1	
Prenatal Care from 2nd tri., blacks	.1924038	.3941889	0	1	616074
Prenatal Care from 2nd tri., whites	.1236233	.3291513	0	1	3222929
Prenatal Care from 3rd trimester	.0280992	.1652564	0	1	
Prenatal Care from 3rd tri., blacks	.043959	.2050041	0	1	616074
Prenatal Care from 3rd tri., whites	.0250676	.1563304	0	1	3222929
No prenatal care	.0106661	.1027243	0	1	
No prenatal care, blacks	.0202508	.1408572	0	1	616074
No prenatal care, whites	.0088339	.0935727	0	1	3222929
Smoked	.1087593	.3113371	0	1	
Smoked, blacks	.0805394	.2721266	0	1	616074
Smoked, whites	.1087593	.3113371	0	1	3222929
Physicians per 100k	293.485	161.3936	90	1236	
County poverty level	.1308798	.0419423	.041	.305	
Education level unknown	.0130148	.1133378	0	1	
Prenatal care unknown	.0277861	.1643595	0	1	
Smoked unknown	.1276196	.3336658	0	1	
Neonatal per 1000	4.552484	67.31835	0	1000	
Neonatal per 1000, blacks	8.867441	93.74873	0	1000	616074
Neonatal per 1000, whites	3.727665	60.94072	0	1000	3222929
Postneonatal per 1000	2.292522	47.82538	0	1000	
Postneonatal per 1000, blacks	4.32091	65.59151	0	1000	616074
Postneonatal per 1000, whites	1.904789	43.60231	0	1000	3222929

Unless otherwise noted number of observations: 3839003

Proposed Models

1.1 Crude Model

Primary focus of this paper was on the difference in IMR between black and white mothers. Following crude model estimates the difference between IMR of black and white mothers.

*Outcome per 1000 = a + b * Mother is Black + u* (Equation 1.1)

Where Outcome is dataset dummy variable *Outcome_1000* defined as 0 if infant lived to his/her first birthday and 1000 otherwise (multiplying by 1000 allows comparing my results with IMR usually stated as number of deaths per 1000 births). Mother is Black, variable *mblack* in dataset equal to 1 if mother's race black and 0 otherwise. Observations, where mother neither black nor white, are excluded in all regressions in this study. The term *u* contains unobserved factors affecting outcome and errors in measuring.

Crude model:	outcome_1000	=	5.6325	+	7.556 mblack	(Estimate 1.1)
			(.046)		(.1146)	
			122.71		65.94	

Regression shows, that possibility for black mother that her child didn't live to the first birthday increases by 7.55 per 1000, compare to the white counterpart. Result is not trivial and statistically significant with standard error .1146 and t-statistics 65.94 with 95% confidence interval.

I assume that independent variables are exogenous due to very nature of our dependent variable *outcome*. I also assume that the dependent variable has a conditional expectation linear in functions of the independent variables; which allows partial effects to be correctly estimated by ordinary least squares. Latter assumption can be verified by estimating average partial effect by probit model and comparing results with ordinary least square (OLS) estimates.

I also use probit model to predict the *outcome*. Average partial effect estimated by probit model is 7.559 for change of binary variable *mblack* from 0 (non-black) to 1 (black) which is the same as ordinary least square (OLS) given in Estimate 1.1. This means we can use OLS estimates crude model.

1.2 Crude Model with control for the states

Crude model showed us that a difference in IMR between blacks and whites exists, is statistically significant, and is large in magnitude. We need to add more independent variables to the model and see if controlling for other factors will reduce or eliminates this difference. From policy maker perspective, a straightforward way is to control for mother's state of residence. If including state of residence dummy variable to crude model will significantly reduce the estimated difference, then states with best policies have lowest estimates. Entire problem will narrow down to adopting most effective policies in states with high estimates. Additionally, blacks might live disproportionally is states with otherwise high IMR.

$$\textit{Outcome per 1000} = a + b * \textit{Mother is Black} + K_i \textit{ dummy state variable} + u \qquad \text{(Equation 1.2)}$$

Where dummy state variable is separate dummy variable for each state. It equal to 1 if mother resides in that state, 0 otherwise.

outcome_1000	=	4.6927	+	7.2882 mblack	+ K_i dummy state variable	(Estimate 1.2)
		(.12)		(.1192)		
		39.09		61.14		

As we can see coefficient on *mblack* is lower than in our crude model (Estimate 1.1). Controlling for the state reduced our difference by 0.2678 per 1000.[21] It also shows that difference in our model largely unrelated to the state of residence.

[21] I picked State of California as the base state for my model. I believe California's large diverse population makes it natural choice for national level model.

2.1 Basic Model with state and age controls

Based on the literature we know that IMR is highly affected by the age of the mother. Studies showed that having birth in teens[22] or after 40 greatly increase IMR. Even though in the free society we can't possibly dictate woman when to have a baby[23], at least we can control for the effect in our model. In addition, if blacks tend to have births at younger or older ages than whites then failing to control for age could lead to spurious race differentials.

*Outcome per 1000 = a + b * Mother is Black +* K_i *dummy state variable +* L_i *dummy age group variable + u*

(Equation 2.1)

Where L_i dummy age group variable is separate dummy variable for age bracket. It equal to 1 if mother is in the bracket, 0 otherwise.[24]

Outcome_1000	=	3.8886	+	6.97 mblack + K_i dummy state var. + L_i dummy age group var.	
		(0.139)		(0.12)	(Estimate 2.1)
		27.94		57.93	

Estimate at mblack was reduced by another 0.3182 per 1000 observations. This leads me to conclusion that more white mothers give a birth in preferable age range, compared to blacks.[25]

To prove existence of a preferable maternal age, I used my entire dataset to estimate simple model for U.S. population in 2004. I created mean IMR for every age in the dataset as depend variable.

*Outcome per 1000 mean = a + b * mother's age + c mother's age ^ 2 + u* (Equation 2.2)

[22] A Friede et al. Public Health Report, Mar-Apr 1987, Young maternal age and infant mortality: the role of low birth weight. Available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1477817/

[23] Author finds the any policy, which restricts the maternal age or the number of kids, violates very core of human rights (even if such policy is effective in reducing IMR it creates enormous drawback form the moral standpoint). One could argue that permitting mother to have child outside of favorable maternal age creates even higher suffering for mother if her child dies. The only very naive solution I could think of is to compare decrease in utility of not having a baby outside of maternal age to decrease in utility of the death of child multiplied by event probability in the population.

[24] Mothers from age 26 to 30 were chosen as a base group.

[25] In the dataset 3.365% of black mothers were between ages 11 and 16, compare to only 1.355% of their white counterparts or 2.5 times higher in the age bracket where IMR averages between 20 and 10 per 1000

I assumed mother's age has diminishing effect on mean IMR model it as quadratic function.

IMR_1000_agemean =	37.6 –	2.072 MAGER +	0.0329 mager_sq	(Estimate 2.2)
	(3.43)	(0.24)	(.0038)	
	10.96	-8.62	8.63	

Figure 1. IMR by Age. Actual values and regression line.

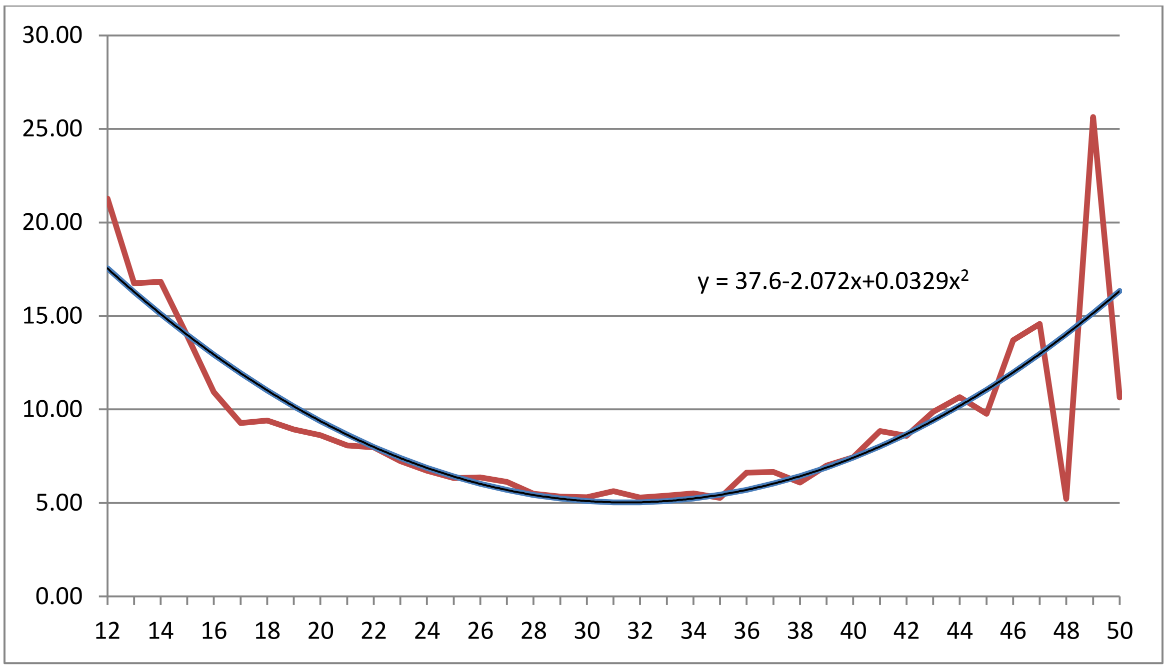

Figure 1, shows that data follows quadratic model fairly close. Actual values have high variance after age of 45 and were slightly under predicted by the model in early teens and over predicted in the late teens. Overall model shows a good fit.[26] Based on the data, IMR below 10 in 2004 was from age 16 to 45 with the lowest points between ages 27 to 35.

[26] Estimate has very high R^2 = 0.6754, which is not surprising because it relies on IMR data aggregated by age

3.1 Education

Since SDC datasets does not contain information about income and health coverage of the mother, I will use level of education attained by mother as my proxy for level of income. The idea is that higher level of education leads to a higher income level. I want to test whether higher level of income leads to lower IMR.

Model with controlled for the state and age (Equation 2.1) will be used as basic model for my paper. I'll add more variables to my basic model to evaluate whether controling for them reduces difference in IMR between balcks and whites.

Let's add education level to our basic model and estimate it for blacks, whites and both group combined.[27]

*Outcome per 1000 = a + b * Mother is Black +* K_i *dummy state variable +* L_i *dummy age group variable +* E_i *dummy education level variable + u* (Equation 3.1)

Table 3.1 Basic model with control for education level with less than High School as a base group

Section 3.1	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	6.726	.12				
high school	-.6	.124	-.246	.405	-.66	.124
more than HS	-2.5	.123	-2.62	.43	-2.48	.123
educ unknown	17.17	.382	28.53	1.17	14.25	.389
cons	4.77	.163	11.45	.77	4.73	.156

Coefficient on black is down to 6.73 comparing to 6.97 (Estimate 2.1). Thus controlling for education reduces our difference in IMR between blacks and whites. Thus higher education level improves IM rate. Estimates show that with each level of education IMR gets smaller for combined group and whites. Attained level of more than high school reduces IMR by 2.5 for 1000.

[27] Education level 'less than high school' was chosen as base for this model.

For blacks, there is small, statistically insignificant difference in IMR between mothers with high school level of education and less than high school, which is about 1/3 of the effect for whites. However there is a drop in IMR for black mothers with more than high school. Dzietham-Picciotto (1998) in their paper noted higher education to appear ineffective in reducing IMR for blacks[28]. One of the possible explanation is (if we assume that higher education leads to higher income leads to lower IMR), that the difference in income between black mother with high school diploma and black mother with less than high school is insignificant to lower IMR. For white mothers the difference in income between high school and less than high school is significant enough to have an effect on the IMR.

4.1 Trimester prenatal care started

There is consensus among medical professionals that woman should start prenatal care as soon as she learns that she is pregnant. However, there are wide gap between black and white mothers regarding who has access to and who utilizes prenatal care. According to the Office of Minority Health, African American mothers were 2.5 times as likely as non-Hispanic white mothers to begin prenatal care in the 3rd trimester, or not receive prenatal care at all. One of the reasons for starting late is that black mothers do not have health coverage. In 2007, 19.5 percent of African-Americans in comparison to 10.4 percent of non-Hispanic whites were uninsured'[29]

*Outcome per 1000 = a + b * Mother is Black +* K_i *dummy state variable +* L_i *dummy age group variable +* C_i *dummy prenatal care + u* (Equation 4.1)

Adding control for the trimester prenatal care begun to our basic model, gives us opportunity to test the hypothesis that not having prenatal care or starting it late increases IMR.

[28] Rebecca Din-Dzietham, Irva Hertz-Picciotto, Infant mortality differences between whites and African Americans: the effect of maternal education. Am J Public Health. 1998 April; 88(4): 651–656. Available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1508444/pdf/amjph00016-0115.pdf

[29] Office of Minority Health, African American Profile, Available at http://minorityhealth.hhs.gov/templates/browse.aspx?lvl=3&lvlid=23

Table 4.1 Basic model with control for prenatal care with 1st trimester as a base group

Section 4.1	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	6.51	.12				
2nd trimester	-.172	.126	-1.76	.38	.287	.13
3rd trimester	-1.15	.257	-4.14	.72	-.145	.27
no precare	27.62	.411	39.64	1.04	22.3	.445
precare unknown	10.67	.26	16.07	.75	9.06	.27
cons	3.66	.14	10.45	.69	3.55	0.13

Controlling for prenatal care reduces our coefficient on black to 6.51. Our data confirms the Office of Minority Health report and suggests that blacks either do not have access or underutilize prenatal care. Data also showed that starting prenatal care in the third trimester do not have negative impact on mortality rate. In fact it is associated with a reduction in the mortality rate for both black and whites. One of possible explanation to the paradox, in my opinion, lies in pregnant woman's self-assessment. When woman feels that pregnancy goes as it should without any complications, she might postpone her prenatal visits till the last trimester.[30]

There is a significant increased risk of infant mortality for women who did not use prenatal care at all (no precare category). Penalty is very high both groups and estimated coefficients among respective groups are 39 for blacks and 22 for whites. Possible explanation is lack of health education, incorrect self-assessment or imprudence.[31] For factors associated with trimester prenatal care started and discussion please see Appendix B.

All in all, the model showed that not utilizing prenatal care leads to fivefold increase in IMR over 1 trimester. Perhaps, improving prenatal care attendance can significantly reduce IMR for both blacks and whites. In this area, appropriate public policy can have greatest effect on IMR in U.S.

[30] One might speculate of possible reasons for such behavior. For example: reducing medical expenses, lack of time for regular prenatal visits during the day, or bias towards healthcare professionals. No matter what reason is woman believes that benefits of not having prenatal visits outweigh the risks.

[31] From the dataset it's hard to say whether self-assessment of white woman, on average, is better than black counterpart, or it's just imprudence. Probably both factors play the role, considering that blacks give birth at younger age and thus more prone to error in judgment.

4.2 Health Care Accessibility

It's reasonable to ask whether deficiency in health care services, such us shortage of doctors and hospitals in the area, lead to higher IMR. I matched my mother's residence county codes in main datasets with U.S Census Bureau, County and City Data Book numbers on physicians and hospital beds per 100 000 population, per county.[32]

The next two estimates have a constraint on results interpretation. My main individual level dataset taken from CDC data does not show mother residency for low populated counties. If a woman resides in the small county, instead of Federal Information Processing Standard[33] (FIPS) county code CDC listed code 999. It was done to protect the privacy. To alleviate this I used county data for counties listed in CDC data (usually metropolitan or highly populated counties) and for small areas (999 codes) I used averages for the rest of counties of that particular state. For example, Providence County, Rhode Island is listed in CDC data, and I used figures given in County and City Data Book. Other four counties: Bristol, Kent, Newport and Washington are relatively small and listed under code 999 in CDC data. In my estimates I used average number of physicians/hospital beds for those four counties, when mother's residence was in one of four counties. I applied same principal for all states.

*Outcome per 1000 = a + b * Mother is Black +* K_i *dummy state variable +* L_i *dummy age group variable +* F_i *number of physicians per 1000 per county + u* (Equation 4.2.1)

Table 4.2.1 Basic model with control for number of physicians per 1000 capita per county

Section 4.2.1	Blacks and Whites		Blacks Only		Whites Only	
	Coefficie nt	SE	Coefficient	SE	Coefficient	SE
mblack	7.045	.12				
Physicians per 1000	-.137	.029	-.0977	.091	-.14	.03
cons	4.26	.16	11.13	.74	4.2	.157

[32] Sadly, I couldn't get county statistics on obstetricians and gynecologists (OB/GYN). I waited for copy of American Medical Association annual edition of Physician Characteristics and Distribution, only to find out that edition doesn't list OB/GYN professions separately from other fields at the county level.

[33] Federal Information Processing Standards, read more at http://www.itl.nist.gov/fipspubs/

*Outcome per 1000 = a + b * Mother is Black +* K_i *dummy state variable +* L_i *dummy age group variable +* H_i *number of hospital beds per 1000 per county + u* (Equation 4.2.2)

Table 4.2.2 Basic model with control for number of hospital beds per 1000 capita per county

Section 4.2.2	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	6.957	.122				
Beds per 1000	.037	.05	.0315	0.135	.031	.054
cons	3.82	.17	10.78	.746	3.74	.17

Coefficients in both models estimated relatively small effect, possibly due to above mentioned constrained. Models showed that we could use better controls for the level and proximity of health services to properly estimate the effect more accurately.

Number of physicians per 1000 population is small but statistically positive effect for whites. At the same time coefficient is statistically insignificant for blacks. There is more than one explanation why only whites can benefit from additional doctors in the area. For example: underutilization of health services by blacks; blacks live in counties with disproportionally high rate of physicians per capita.

5.1 Smoking during pregnancy

Smoking during pregnancy was long known for its negative impact on fetal development. According to Robert Welch, the chairman of the Department of Obstetrics and Gynecology at Providence Hospital in Southfield, Michigan, “Smoking cigarettes is probably the No. 1 cause of adverse outcomes for babies". Cigarette smoke contains more than 4,000 chemicals, including cyanide, lead, and at least 60 cancer-causing compounds. When a woman smokes during the pregnancy, toxins get into mother’s bloodstream and transfer to the baby through the placenta. There is large number of medical papers were written about harmful effect of smoking on unborn child. More than 100 years ago John Williams Ballantyne, considered one of the founding fathers of modern prenatal care[34], noted that miscarriages were more common in female tobacco factory workers.

[34] John Williams Ballantyne biography can be found on http://humupd.oxfordjournals.org/content/5/4/386.full.pdf

Cramer (1995) in his study noted that minorities smoke less during the pregnancy, depressing differences in birthweight. Thus controlling for the tobacco use during the pregnancy seems to be viable option. Perhaps, smoking habits can be adjusted (at least for the time of pregnancy), through the proactive public policy and education of the smokers.[35]

*Outcome per 1000 = a + b * Mother is Black +* K_i *dummy state variable +* L_i *dummy age group variable +* S_i *smoked during pregnancy + u* (Equation 5.1)

Table 5.1 Basic model with control for smoking

Section 5.1	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	7.12	.12				
smoked	4.47	.15	7.23	.557	3.95	.145
smoked unknown	14.48	.62	32.17	1.98	10.54	.62
cons	3.63	.32	6.82	1.81	3.84	.297

As we can see smoking raises IMR by more than 7 for blacks and almost 4 for whites. At the same time controlling for smoking increased difference between blacks and whites. Assuming negative influence of smoking and that mother data implies that white mothers smoke more often during the pregnancy.[36]

6.1 Poverty Level

From individual level data provided by CDC we can't tell if mother of the child lives in poverty. I already tried to address this by linking income to mother's level of education attained. In this section I want to check if combining individual records with poverty level records by county, taken from U.S. Census Bureau, will reduce the gap between black and whites. In my dataset county poverty level is percentage of population living in poverty in that county divided by hundred. To merge records I used the same method as in the health care accessibility section.

[35] James Cramer, Racial and ethnic differences in birthweight: the role of income and financial assistance, Demography. 1995 May; 32(2):231-47.
[36] Based on data 10.9% of white mothers smoked during the pregnancy compared to only 8.2% for black

*Outcome per 1000 = a + b * Mother is Black +* K_i *dummy state variable +* L_i *dummy age group variable +* V_i *county poverty level + u* (Equation 6.1)

Table 6.1 Basic model with control for county poverty level

Section 6.1	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	6.94	.12				
county poverty	2.104	1.27	2.695	4.127	.63	1.3
cons	3.607	.22	10.468	10.47	3.71	.22

Coefficient on county poverty level is insignificant with 5% confidence interval, while significant with 10% confidence interval.

It gives us weak evidence that higher poverty level in the county leads to higher IMR. But not knowing income on individual level blurs results. Mario Sims[37] et al (2007) tried to address this issue by comparing IMR in metropolitan areas, but results were statistically insignificant. Aber et al[38] (1997) precisely pointed out the issue that "few useful socioeconomic covariates appear on birth or death certificates". Lack of such information seriously hinders the ability of the researcher to produce reliable estimates. One of the ways to improve the results quality and prove straightforward relationship between IMR and poverty is to conduct an experiment[39].

6.2 Marital Status

Here I attempted to link IMR with social economic status, without depending on income level. Even though income level is lacking in individual level data, marital status is still present. Idea behind it is simple. Use marital status as a double proxy. First it shows lower bound of family income, second it reveals amount of time and support can be given to pregnant woman and later to a newborn.

[37] Mario Sims et al, Journal Of The National Medical Association, Vol. 99, No. 4, April 2007, Urban Poverty and Infant Mortality Rate Disparities, http://www.nmanet.org/images/uploads/Publications/OC349.pdf
[38] Aber et al, Annual Review Public Health. 1997. 18:463–83, The Effects Of Poverty On Child Health And Development http://homepages.nyu.edu/~dc66/pdf/res_Annual_Review_aber_etal.pdf
[39] To be conclusive, such experiment need substantial funding, and can resemble a study conducted by UK government in late 1970s and known as Black Report. Available at http://www.sochealth.co.uk/Black/black.htm

The lower bound in family income is based on the assumption that even when a woman doesn't work, her husband has a job.[40] After all if you're single you can't make more than single income. A married couple can have the single income of the husband plus the income of the wife multiplied by probability of her having a job. The amount of time and support given to woman and newborn follows from the first assumption. Even though, both assumptions are weakened by the possibility that pregnant woman might still live with her parents, I believe it worth to try to accommodate marital status into the model.

*Outcome per 1000 = a + b * Mother is Black +* K_i *dummy state variable +* L_i *dummy age group variable +* P_i *married + u* (Equation 6.2)

Table 6.2 Basic model with control for marital status

Section 6.2	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	6.21	.12				
Married	-2.45	.1	-3.65	.35	-2.14	.1
cons	5.72	.15	12.53	.71	5.4	.15

Result showed that controlling for marital status significantly reduced the difference between blacks and whites. No other socio-economic variable evaluated in this paper was able to shrink the gap to such degree. Mentioned earlier possibility that woman could still live with her parents, which will lessen income effect and make results insignificant, proven to be wrong. In fact results showed that true influence of marital status on IMR is even higher, because at least some single women are sheltered by her parents. Thus we can anticipate the real impact of being married on IMR even is higher.

Perhaps, having less income due to being single and lack of support[41] puts woman in considerable disadvantage and leads to higher IMR. The impact is very large and significant for both groups. The model implies that black mothers more often to have children while being single compare to white mothers, and hence suffer from adverse effect more often.[42]

[40] Of course there's possibility that both don't have a job but this possibility lower compare to single woman. We can also take into account that men make more on average than women.
[41] Here I mean not a financial, but moral support and help during the pregnancy. We usually call it: taking care of pregnant wife.
[42] In 2004 - 69.5% of white mothers reported of being married compared to only 31.2% of black counterparts

7.1 Combined Model

Based on discussions in previous sections I believe following variables belong to the model that explains gap in IMR between blacks and whites. Education attained, trimester prenatal care begun, county poverty level and physicians per capita, smoking habits and marital status. Most of them have positive impact on reducing gap between black and whites.

*Outcome per 1000 = a + b * Mother is Black +* K_i *State +* L_i *Age Group +* E_i *Education Level +* P_i *Married +* C_i *Prenatal Care +* V_i *County Poverty Level +* F_i *physicians per 1000 +* S_i *smoked + u* (Equation 7.1)

Table 7.1 Combined factors model

Section 7.1	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	6.22	.13				
high school	-.14	.12	.83	.41	-.3	0.125
more than HS	-1.39	.13	-.44	.44	-1.52	0.13
2nd trimester	-.78	.13	-2.34	.38	-.31	0.13
3rd trimester	-1.98	.26	-4.99	.72	-.95	0.27
no precare	25.93	.41	37.14	1.05	20.83	0.45
married	-1.33	.11	-2.37	.36	-1.08	.11
smoked	3.54	.15	5.41	.57	3.18	.15
county poverty	-.73	1.28	-0.94	4.14	-1.54	1.31
Docs per 1000	-.15	.03	-.176	.09	-.13	0.03
smoked unknown	8.88	.62	22.45	1.99	6.01	.63
precare unknown	8.96	.26	12.9	0.76	7.7	.27
educ unknown	15.39	.38	24.37	1.19	13.02	.39
cons	-3.27	.67	-10.86	2.23	-.48	.68

Our coefficient on *mblack* fell to 6.22, compare to 7.55 in crude model (Estimate 1.1) and 6.97 in basic model (Estimate 2.1). (Full results available in Appendix A tables 7.1a-c). Thus, selected socioeconomics factors able to explain only 0.75 out 6.97 deaths difference between blacks and whites or about 10.76%. All other coefficients in column one (black and white) behave in expected way described in previous sections.

To better understand the differences between black and whites let's concentrate on columns two and three: black only and white only.

The education level, (as we discussed in section 3.1 it's our proxy for income) gradually decreases IMR for whites. For blacks, we start seeing decrease only at education level more than high school, and decrease three times lower compare to whites. One the possible explanations is that blacks can't use attained level of education to generate income at the same rate as whites do (possibly due to acquiring less human capital in school for any reason including quality of teaching and incentive to learn).

For whites we can see gradual improvement towards 3rd trimester, but it doesn't mean that it's better to start prenatal care in the last three months. As I proposed in section 4.1 paradoxical improvements in IMR could be due to self-assessment effect. For blacks self-assessment effect more than 5 times higher than for whites. When we look at coefficient on no prenatal care variable, it's more than 37.1 for blacks and only 20.8 for whites (these two numbers are very high in magnitude and largest increase in IMR for both groups). Section 4.1 explains it as a combination of self-assessments and imprudence.

Being married is very important factor in lowering IMR for both groups, but for blacks the positive effect is twice as higher. As we discussed in section 6.2 being married helps lower IMR in two ways: additional income and support.

If I exclude smoking related variables from the model, model will explain 1.68 deaths difference or 22%. It demonstrates that blacks smoke less during the pregnancy which helps them narrow the gap.

The county poverty level was borderline significant with 10% confidence interval (Table 6.1), but in combined model changed sign and lost any significance due to high positive correlation with variables black, mother education more than high school, married (negative correlation).[43]

For both groups, coefficients on unknown (variables with missing data) are associated with adverse levels of the IMR. I can't find a reasonable explanation, but I decided to keep them in the model because removing records with missing data significantly reduces sample size and disproportionally removes

[43] I could drop county poverty level from final combined model but effect of not omitting it is negligible.

blacks from the sample.[44] Another reason is that correlation between different unknowns is not as high as we might think. It's common to have missing data only for one factor, for example, trimester prenatal care started, but have data for two other factors: mother education and smoking during the pregnancy.[45]

7.2 Combined Model for Neonatal Mortality

By convention, infant mortality analysis often subdivided into two periods—the neonatal and postneonatal. Neonatal period or first 28 days of life[46] and postneonatal period covers the remaining eleven months of the first year of life.

Based on data out of 26,278 deaths, neonatal mortality accounted for 17,477 occurrences or 66.51% and postneonatal accounted for 8,801 occurrences or 33.49% occurrences. Among blacks neonatal mortality was 67.24% and among whites 66.18%.[47]

The skewness in infant mortality towards first month of life suggests that factors influencing IMR in neonatal and postneonatal period are different or at least magnitude of factors changes over periods. Based on this assumption we need to check how factors of our model are going to behave in each period.

*Neonatal Mortality per 1000 = a + b * Mother is Black +* K_i *State +* L_i *Age Group +* E_i *Education Level +* P_i *Married +* C_i *Prenatal Care +* V_i *County Poverty Level +* F_i *physicians +* S_i *smoked + u* (Equation 7.2)

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[44] Based on my estimates records for blacks more often have missing data for all three factors.

[45] Omitting unknown variables from the model increase the gap between blacks and whites to 6.45 per 1000. Removing records with missing data from the sample reduces the gap to 5.88 per 1000. Thus missing records increase the gap between black and whites and there's more missing data on blacks compare to whites. Finding a solution to missing data can further extend our understanding of the adverse effect. There are several modern statistical methods help to fill-in missing data. Unfortunately none of them as good as actual data.

[46] According to my calculations in 2004 66% of infants' deaths occurred in neonatal period, and 40% of deaths occurred in the first day of life.

[47] For comparison neonatal mortality is 68.80% for Asians and 68.63% for Hispanics

Table 7.2 Combined factors Model for Neonatal Period

Section 7.2	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	4.34	.1				
high school	.3	.1	1.87	.34	.008	0.1
more than HS	-.47	.1	1.27	.36	-.74	0.1
2nd trimester	-1.1	.1	-2.72	.31	-.64	.11
3rd trimester	-2.36	.21	-5.44	.59	-1.34	.22
no precare	21.88	.34	31.86	.86	17.39	.36
married	-.82	.09	-1.47	.29	-.64	.086
smoked	1.10	.12	1.51	.47	1.00	.12
county poverty	-1.2	1.04	-3.74	3.43	-1.36	1.07
Docs per 1000	-.11	.024	-.12	.075	-.1	.025
smoked unknown	7.24	.51	18.05	1.64	4.93	.51
precare unknown	7.81	.22	10.9	.62	6.78	.22
educ unknown	15.52	.31	25.99	.97	12.82	.32
cons	-3.73	.55	-11.26	1.83	-1.39	.55

Coefficients estimated for neonatal period amplify behavior of our combined model (Table 7.1), full results in Appendix A. Tables 7.2a-c. In neonatal period only whites get reduction in IMR with increased level of mother's education, and only when mother's education higher than high school. Both groups have seemingly lower IMR when they postpone beginning of prenatal care. I gave possible explanation to this paradox in Section 4.1, and we will continue to discuss in Section 7.3

7.3 Combined Model for Postneonatal Mortality

Following model conditioned on infant survival in neonatal period.

*Postneonatal Mortality per 1000 = a + b * Mother is Black +* K_i *State +* L_i *Age Group +* E_i *Education Level +* P_i *Married +* C_i *Prenatal Care +* V_i *County Poverty Level +* F_i *physicians +* S_i *smoked + u* (Equation 7.3)

Table 7.3 Combined factors Model for Postneonatal Period

Section 7.3	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	1.91	.07				
high school	-.44	.07	-1.04	.24	-.31	.07
more than HS	-.93	.07	-1.71	.26	-.78	.07
2nd trimester	.32	.07	.376	.22	.33	.077
3rd trimester	.37	.15	.42	.42	.38	.158
no precare	4.25	.24	5.67	.62	3.57	.26
married	-.52	.06	-.92	.21	-.44	.06
smoked	2.45	.088	3.95	.33	2.2	.087
county poverty	.47	.74	2.8	2.4	-.185	.768
Docs per 1000	-.0386	.017	-.057	.053	-.035	.0176
smoked unknown	1.7	.36	4.65	1.17	1.1	.37
precare unknown	1.18	.15	2.1	.44	.95	.16
educ unknown	-.057	.23	-1.49	.7	.25	.23
cons	.41	.39	.18	1.31	.89	.4

As we can see applying model to two periods separately yields surprising results. Coefficients estimated for postneonatal period different from estimates in combined model (Table 7.1). In postneonatal period the elements that made white and black groups behave differently disappeared. Estimates follow expected theoretical path. Gradual decrease in IMR with level of education became more prominent and significant for whites and became new pattern for blacks. Gradual increase in IMR with trimester prenatal care started reversed its course from neonatal period and became new norm for both blacks and whites. In postneonatal period everything progresses according to common sense.

Striking difference between neonatal and posneonatal periods can be explained by the different nature of mortality. Education and prenatal care variables measure different factors in different periods.

The posneonatal mortality depends on nutrition, environmental risk factors and health care coverage of infant. All three factors correlate with income. And income correlates mother's level of education and health insurance coverage. Coefficients on education are a proxy for income and trimester prenatal care began proxy for health insurance coverage.

Neonatal mortality depends on maternal health, genetic disorders, level of prenatal care, nutrition of the mother, proficiency in medical treatment and sophistication of equipment. Simply put neonatal mortality depends more on factors outside of our control than postneonatal mortality.

Education level in our model is proxy for income[48], and as mentioned earlier blacks unable to turn education to income at the same rate as whites do. But more research needed to explain why black mothers with less than high school education level have lower IMR in neonatal period than black mothers with high school or more education level attained.[49]

In general there is a good chance to have a healthy baby without any medical intervention during the pregnancy. Most of the doctor's visits in the course of pregnancy aimed at monitoring development of the fetus and mother's health. Mothers who do not start prenatal care from the first trimester either face high insurance deductible and trying save on doctor's visits (we could think of them as risk-takers who trusts their self-assessment), imprudent mothers and mothers with no health coverage. Thus, trimester prenatal care began measures outcomes for such mothers. I assume risk-taker has an insurance or income to pay for visits and she will start seeing the doctor in the 3rd trimester (to save on copay and deductible) or sooner if she feels that something is wrong with the pregnancy. Thus negative estimates on 2nd and 3rd trimesters are from risk-takers and no-insurance mothers with healthy pregnancy. Mortality is heavily concentrated on no prenatal care category. In my opinion, those are mothers with no health insurance coverage and imprudent mothers who unfortunate enough to have unhealthy pregnancy.[50]

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[48] Generally speaking there is more than just income we could include individual ability, family background, level can be affected by different rate of access to funds, but we'll focus on income as one of socioeconomic factors.

[49] Black mothers the only one experiencing higher estimates with increased level of education in neonatal period. Hispanics and Asians have estimates similar to whites.

[50] Growth in IMR with trimester prenatal care started in postneonatal period perhaps can be explained by how much resources were devoted to an infant. Newborns with severe health issues died during neonatal period. Rest of infants depended on resources and efforts devoted by their mothers or parents. Starting prenatal care yearly can be viewed as resource proxy. Dedicated mothers and mothers with greater resource available likely to start prenatal care earlier and keep putting more resources and efforts after child was born.

Dividing on neonatal and postneonatal periods highlighted difference in causes of infant mortality between periods. Postneonatal mortality more receptive to positive changes in socioeconomics factors, at the same time more research is needed to explain dynamics of prenatal moprtality.

Conclusion

Society achieved exceptional decline in infant mortality rate in the last century. Most of it was due to staggering achievements in modern medicine especially in areas of maternal, prenatal and infant care.[51] Efforts by both public and private sector to bring improvements in care to every single mother and infant in U.S. lead to astonishing more than 90% decline in IMR.[52] From other side disparity in IMR between different social and racial groups stayed significant.

This study shows that socioeconomic factors still play significant role in IMR. Targeted public programs with focus on economically and socially disadvantaged could further reduce the IMR disparity and consequently lower nation's IMR.[53]

Mother's level education associated with lower IMR for blacks and whites in postneonatal period. In neonatal period it has a positive effect for white mothers with education level higher than high school. Black mothers with an education at the high school level or higher have IMR rate well above black mothers with education levels less than high school.

Early prenatal care has positive impact on postneonatal mortality. For neonatal mortality results are reversed, and more research is needed to explain it. Study showed that not having prenatal care at all increases the risk of infant mortality in both periods. As result a lower rate of infant mortality can be achieved by encouraging use of prenatal care. This is especially important for black mothers who lag behind white mothers in prenatal care utilization. Encouragement can be done in form of education in black communities and schools. We can also use subsidies or tax breaks to help mothers of both races

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[51] For more information please see Appendix C. Copy of Vital Statistics Report No 41, Bureau of Census, Department of Labor and Commerce, Number and Proportion of Deaths for Period Between 1900 – 1906.

[52] CDC MMW Report October 01, 1999 / 48(38);849-858 Achievements in Public Health, 1900-1999: Healthier Mothers and Babies, available at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4838a2.htm

[53] We could estimate socioeconomic factors influencing gap more precisely if we could use direct measures of income and utilization of health care (including insurance coverage). Unfortunately on individual level CDS data gives us only proxies for such measures and county level data is insignificant due to many limitations described in the paper

with prenatal care payments and deductibles. Another possible way to achieve this goal is through expansion of Medicaid program since it targets those with low income.

Because infants of married women face significantly reduced rates of mortality, another recommendation is to promote family planning during school years with an emphasis on having kids in stable relationship. This should reduce disparity between blacks and whites.

And last but not least is pursuing programs that educate women about the harm of smoking during the pregnancy. This recommendation is more directed to white mothers who have higher rates of smoking.

While infant mortality is an important public health problem, is also an important socio-economic indicator. It reveals shortcomings of society and highlights areas and social groups which require attention. Addressing the issue and leveling IMR among different groups, through the appropriate and targeted public policies, will lead to a healthier, happier, and more efficient society.

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Appendix A. Table 7.1a Combined model estimates. (Blacks & Whites)

```
. reg  outcome_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK
> AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD
>  TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_
> poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mblack==1 | mwhite==1
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Source	SS	df	MS
Model	101622429	71	1431301.81
Residual	2.5997e+10	3838931	6771.80822
Total	2.6098e+10	3839002	6798.15403

Number of obs = 3839003
F(71,3838931) = 211.36
Prob > F = 0.0000
R-squared = 0.0039
Adj R-squared = 0.0039
Root MSE = 82.291

outcome_1000	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	6.218724	.1270305	48.95	0.000	5.969749	6.4677
married	-1.334116	.1063545	-12.54	0.000	-1.542567	-1.125665
age_11_16	3.084779	.3512087	8.78	0.000	2.396422	3.773136
age_17_18	.7389242	.2227038	3.32	0.001	.3024327	1.175416
age_19_21	.5770845	.1490377	3.87	0.000	.2849758	.8691932
age_22_25	.0548451	.1249073	0.44	0.661	-.1899687	.2996589
age_31_35	.290733	.1234014	2.36	0.018	.0488707	.5325954
age_36_40	1.424916	.1634143	8.72	0.000	1.10463	1.745202
age_41_45	3.64785	.3473287	10.50	0.000	2.967099	4.328602
age_46_older	6.912975	1.545072	4.47	0.000	3.88469	9.941261
AK	7.802943	1.169031	6.67	0.000	5.511683	10.0942
AL	11.03829	.7178161	15.38	0.000	9.631395	12.44518
AR	10.61304	.7597114	13.97	0.000	9.124037	12.10205
AZ	9.839328	.6838411	14.39	0.000	8.499024	11.17963
CO	10.14234	.7085458	14.31	0.000	8.753614	11.53106
CT	9.552228	.757	12.62	0.000	8.068535	11.03592
DC	10.9526	1.146209	9.56	0.000	8.706068	13.19913
DE	11.30816	1.011472	11.18	0.000	9.325706	13.29061
FL	9.4778	.6581489	14.40	0.000	8.187852	10.76775
GA	10.50221	.6696681	15.68	0.000	9.18968	11.81473
HI	9.573898	1.256699	7.62	0.000	7.110813	12.03698
IA	9.472425	.7620685	12.43	0.000	7.978797	10.96605
ID	9.977777	.8398791	11.88	0.000	8.331643	11.62391
IL	10.24699	.661915	15.48	0.000	8.949657	11.54432
IN	11.06226	.6906021	16.02	0.000	9.708707	12.41582
KS	11.32672	.7592653	14.92	0.000	9.838584	12.81485
KY	10.08517	.7235843	13.94	0.000	8.666967	11.50337
LA	12.13096	.7145858	16.98	0.000	10.73039	13.53152
MA	9.032684	.7053818	12.81	0.000	7.65016	10.41521
MD	10.87461	.7089611	15.34	0.000	9.485073	12.26415
ME	10.29593	.9463686	10.88	0.000	8.441084	12.15078
MI	10.03665	.6583015	15.25	0.000	8.746405	11.3269
MN	8.179987	.7016484	11.66	0.000	6.804781	9.555194
MO	10.15406	.6969012	14.57	0.000	8.788159	11.51996
MS	11.04587	.7523258	14.68	0.000	9.571338	12.5204
MT	8.844728	1.03942	8.51	0.000	6.807502	10.88195
NC	11.47067	.6756718	16.98	0.000	10.14638	12.79497
ND	10.37778	1.161529	8.93	0.000	8.101224	12.65434
NE	10.45507	.816954	12.80	0.000	8.853868	12.05627
NH	9.743612	.9412049	10.35	0.000	7.898884	11.58834
NJ	8.773547	.6831357	12.84	0.000	7.434626	10.11247
NM	8.912362	.8172211	10.91	0.000	7.310637	10.51409
NV	7.942006	.7734291	10.27	0.000	6.426112	9.4579
NY	9.382233	.6562804	14.30	0.000	8.095947	10.66852
OH	10.25095	.6664377	15.38	0.000	8.944759	11.55715
OK	10.9599	.7370196	14.87	0.000	9.515364	12.40443
OR	9.780294	.7427455	13.17	0.000	8.324539	11.23605
PA	9.795056	.6603402	14.83	0.000	8.500812	11.0893
RI	8.387042	.9710304	8.64	0.000	6.483857	10.29023
SC	11.49944	.7224496	15.92	0.000	10.08346	12.91541
SD	11.16542	1.059567	10.54	0.000	9.088707	13.24213
TN	10.09314	.6973846	14.47	0.000	8.726289	11.45999
TX	9.366991	.6461224	14.50	0.000	8.100614	10.63337
UT	9.537385	.7307411	13.05	0.000	8.105159	10.96961
VA	10.66879	.6865279	15.54	0.000	9.32322	12.01436
VT	8.754159	1.201966	7.28	0.000	6.398349	11.10997
WA	8.025954	.6984293	11.49	0.000	6.657057	9.394851
WI	10.11716	.7065254	14.32	0.000	8.732394	11.50192
WV	10.66574	.851477	12.53	0.000	8.996872	12.3346
WY	12.78855	1.206037	10.60	0.000	10.42476	15.15234
meduc_ru_hs	-.1357634	.1244971	-1.09	0.275	-.3797733	.1082465
meduc_ru_m~s	-1.389246	.127609	-10.89	0.000	-1.639355	-1.139137
precare_2t~r	-.7762637	.127806	-6.07	0.000	-1.026759	-.5257685
precare_3t~r	-1.983452	.257969	-7.69	0.000	-2.489062	-1.477842
precare_none	25.93063	.412803	62.82	0.000	25.12155	26.73971
smoked	3.53712	.1511775	23.40	0.000	3.240817	3.833422
county_pov~l	-.7275355	1.276406	-0.57	0.569	-3.229246	1.774175
physici~1000	-.1518118	.0293322	-5.18	0.000	-.2093019	-.0943217
smoked_unk~n	8.88528	.6215357	14.30	0.000	7.667092	10.10347
precare_un~n	8.961381	.2633671	34.03	0.000	8.445191	9.477571
meduc_ru_u~n	15.39269	.3848942	39.99	0.000	14.63831	16.14707
_cons	-3.274462	.6733763	-4.86	0.000	-4.594255	-1.954668

reg outcome_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mblack==1 | mwhite==1

Table 7.1b Combined model. (Blacks)

```
. reg  outcome_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK
> AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD
>  TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_
> poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mblack==1
```

Source	SS	df	MS
Model	39512615.2	70	564465.931
Residual	7.9783e+09	616003	12951.7746
Total	8.0178e+09	616073	13014.4393

Number of obs =	616074
F(70,616003) =	43.58
Prob > F =	0.0000
R-squared =	0.0049
Adj R-squared =	0.0048
Root MSE =	113.81

outcome_1000	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	(dropped)					
married	-2.373496	.3599391	-6.59	0.000	-3.078965	-1.668027
age_11_16	1.430382	.9176714	1.56	0.119	-.3682245	3.228988
age_17_18	-1.23766	.6509819	-1.90	0.057	-2.513564	.0382432
age_19_21	-1.411914	.4732731	-2.98	0.003	-2.339515	-.4843144
age_22_25	-1.141869	.4314851	-2.65	0.008	-1.987566	-.2961723
age_31_35	.8418301	.4927312	1.71	0.088	-.1239072	1.807567
age_36_40	1.408118	.6450059	2.18	0.029	.1439276	2.672309
age_41_45	3.737761	1.323483	2.82	0.005	1.143776	6.331746
age_46_older	2.174428	6.331789	0.34	0.731	-10.23568	14.58453
AK	32.29318	6.077514	5.31	0.000	20.38145	44.20491
AL	25.20327	2.250327	11.20	0.000	20.7927	29.61384
AR	23.01757	2.466536	9.33	0.000	18.18324	27.85191
AZ	19.25745	2.834246	6.79	0.000	13.70242	24.81248
CO	26.38377	2.965094	8.90	0.000	20.57228	32.19525
CT	24.16518	2.614963	9.24	0.000	19.03994	29.29042
DC	24.49063	2.659995	9.21	0.000	19.27712	29.70413
DE	26.26196	2.968019	8.85	0.000	20.44474	32.07918
FL	22.94807	2.149498	10.68	0.000	18.73512	27.16101
GA	25.52246	2.149819	11.87	0.000	21.30889	29.73604
HI	30.21115	5.19814	5.81	0.000	20.02296	40.39934
IA	17.20582	3.619058	4.75	0.000	10.11258	24.29905
ID	11.06239	11.05133	1.00	0.317	-10.59786	32.72264
IL	24.72223	2.177069	11.36	0.000	20.45525	28.98922
IN	26.38013	2.381164	11.08	0.000	21.71313	31.04714
KS	24.24566	2.982472	8.13	0.000	18.40011	30.09121
KY	24.02547	2.644095	9.09	0.000	18.84313	29.20782
LA	26.31939	2.213869	11.89	0.000	21.98028	30.65851
MA	21.54921	2.443113	8.82	0.000	16.76078	26.33763
MD	25.28522	2.212004	11.43	0.000	20.94976	29.62068
ME	25.96707	7.868872	3.30	0.001	10.54433	41.38981
MI	25.36897	2.186719	11.60	0.000	21.08307	29.65487
MN	16.5338	2.467806	6.70	0.000	11.69698	21.37062
MO	23.86399	2.339502	10.20	0.000	19.27864	28.44934
MS	26.23352	2.257115	11.62	0.000	21.80965	30.6574
MT	12.15001	15.77074	0.77	0.441	-18.76013	43.06015
NC	27.82136	2.190099	12.70	0.000	23.52883	32.11388
ND	22.96069	11.80237	1.95	0.052	-.171574	46.09295
NE	24.89764	3.551211	7.01	0.000	17.93739	31.8579
NH	30.16795	7.416579	4.07	0.000	15.6317	44.70421
NJ	21.23851	2.236962	9.49	0.000	16.85413	25.62288
NM	18.95284	5.481417	3.46	0.001	8.209437	29.69624
NV	22.34235	2.937957	7.60	0.000	16.58405	28.10065
NY	23.03042	2.158618	10.67	0.000	18.7996	27.26124
OH	24.21126	2.207872	10.97	0.000	19.8839	28.53861
OK	24.81034	2.6411	9.39	0.000	19.63387	29.98681
OR	19.64434	4.061965	4.84	0.000	11.68302	27.60566
PA	21.63245	2.146849	10.08	0.000	17.4247	25.84021
RI	16.61384	3.841904	4.32	0.000	9.083836	24.14385
SC	26.6926	2.237301	11.93	0.000	22.30756	31.07764
SD	19.13615	9.616144	1.99	0.047	.288817	37.98348
TN	24.15671	2.264014	10.67	0.000	19.71931	28.5941
TX	22.79994	2.155199	10.58	0.000	18.57582	27.02406
UT	25.39934	5.833071	4.35	0.000	13.96671	36.83197
VA	25.47247	2.220612	11.47	0.000	21.12014	29.8248
VT	11.00344	14.96511	0.74	0.462	-18.3277	40.33458
WA	16.37321	2.718446	6.02	0.000	11.04515	21.70128
WI	30.15772	2.514005	12.00	0.000	25.23035	35.08508
WV	21.24539	4.861678	4.37	0.000	11.71666	30.77412
WY	12.99666	15.48712	0.84	0.401	-17.3576	43.35093
meduc_ru_hs	.82608	.4083094	2.02	0.043	.0258067	1.626353
meduc_ru_m~s	-.4422727	.442232	-1.00	0.317	-1.309033	.4244879
precare_2t~r	-2.337809	.3827942	-6.11	0.000	-3.088073	-1.587545
precare_3t~r	-4.992972	.7210937	-6.92	0.000	-6.406293	-3.579652
precare_none	37.13756	1.045257	35.53	0.000	35.08889	39.18623
smoked	5.411275	.5696155	9.50	0.000	4.294847	6.527703
county_pov~l	-.9401244	4.173504	-0.23	0.822	-9.120059	7.23981
physici~1000	-.1759727	.0916104	-1.92	0.055	-.3555261	.0035808
smoked_unk~n	22.45457	1.993018	11.27	0.000	18.54831	26.36082
precare_un~n	12.91508	.7589049	17.02	0.000	11.42765	14.40251
meduc_ru_u~n	24.36783	1.186645	20.54	0.000	22.04205	26.69362
_cons	-10.85507	2.229504	-4.87	0.000	-15.22483	-6.485312

reg outcome_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mblack==1

Table 7.1c Combined model. (Whites)

```
. reg  outcome_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK
> AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD
>  TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_
> poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mwhite==1
```

Source	SS	df	MS		
Model	40932796.7	70	584754.239	Number of obs	= 3222929
Residual	1.8010e+10	3222858	5588.15227	F(70,3222858)	= 104.64
Total	1.8051e+10	3222928	5600.7314	Prob > F	= 0.0000
				R-squared	= 0.0023
				Adj R-squared	= 0.0022
				Root MSE	= 74.754

outcome_1000	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	(dropped)					
married	-1.076634	.1063067	-10.13	0.000	-1.284991	-.8682768
age_11_16	3.928351	.3818188	10.29	0.000	3.179999	4.676702
age_17_18	1.4146	.2315044	6.11	0.000	.9608598	1.868341
age_19_21	1.101968	.1511973	7.29	0.000	.805627	1.39831
age_22_25	.2908802	.1240299	2.35	0.019	.0477861	.5339744
age_31_35	.2300145	.1195821	1.92	0.054	-.0043622	.4643912
age_36_40	1.421012	.1585902	8.96	0.000	1.110181	1.731843
age_41_45	3.618073	.338657	10.68	0.000	2.954317	4.281829
age_46_older	7.616078	1.491086	5.11	0.000	4.693602	10.53855
AK	4.40092	1.118284	3.94	0.000	2.209123	6.592717
AL	8.301021	.7358526	11.28	0.000	6.858776	9.743266
AR	8.142522	.7657223	10.63	0.000	6.641733	9.64331
AZ	7.209131	.67879	10.62	0.000	5.878727	8.539536
CO	7.094123	.7020027	10.11	0.000	5.718222	8.470023
CT	6.54513	.7548148	8.67	0.000	5.065719	8.02454
DC	6.759068	1.691794	4.00	0.000	3.443211	10.07493
DE	8.053339	1.051553	7.66	0.000	5.992333	10.11435
FL	6.794794	.663533	10.24	0.000	5.494293	8.095295
GA	7.20568	.6807432	10.59	0.000	5.871447	8.539912
HI	5.932779	1.218928	4.87	0.000	3.543722	8.321836
IA	6.82049	.7485665	9.11	0.000	5.353326	8.287654
ID	7.085373	.8108047	8.74	0.000	5.496225	8.674522
IL	7.258263	.6659859	10.90	0.000	5.952954	8.563572
IN	7.990395	.6902565	11.58	0.000	6.637517	9.343273
KS	8.479592	.7497832	11.31	0.000	7.010043	9.949141
KY	7.195165	.718849	10.01	0.000	5.786246	8.604084
LA	9.468695	.7466192	12.68	0.000	8.005348	10.93204
MA	6.349789	.704212	9.02	0.000	4.969559	7.73002
MD	7.681597	.732782	10.48	0.000	6.24537	9.117824
ME	7.380855	.9057824	8.15	0.000	5.605554	9.156157
MI	6.852632	.660957	10.37	0.000	5.557179	8.148084
MN	5.86769	.7002066	8.38	0.000	4.49531	7.24007
MO	7.317417	.698543	10.48	0.000	5.948297	8.686536
MS	7.626938	.8036449	9.49	0.000	6.051823	9.202054
MT	6.004261	.9839805	6.10	0.000	4.075694	7.932828
NC	7.880206	.6824099	11.55	0.000	6.542707	9.217706
ND	7.491124	1.094758	6.84	0.000	5.345438	9.636811
NE	7.48115	.8002188	9.35	0.000	5.912749	9.04955
NH	6.766248	.9025199	7.50	0.000	4.997341	8.535155
NJ	6.194459	.6879312	9.00	0.000	4.846139	7.54278
NM	6.22695	.7927502	7.85	0.000	4.673187	7.780712
NV	5.117396	.7637662	6.70	0.000	3.620441	6.61435
NY	6.620419	.6607525	10.02	0.000	5.325367	7.91547
OH	7.304039	.6697349	10.91	0.000	5.991382	8.616696
OK	8.078615	.7325239	11.03	0.000	6.642894	9.514336
OR	6.985275	.7291458	9.58	0.000	5.556175	8.414375
PA	7.189832	.666741	10.78	0.000	5.883044	8.496621
RI	6.13065	.9501975	6.45	0.000	4.268296	7.993003
SC	8.255044	.7478524	11.04	0.000	6.789279	9.720808
SD	8.342855	1.005187	8.30	0.000	6.372725	10.31299
TN	7.159233	.7039061	10.17	0.000	5.779602	8.538864
TX	6.570013	.6487465	10.13	0.000	5.298493	7.841534
UT	6.56849	.71814	9.15	0.000	5.16096	7.976019
VA	7.572517	.6937852	10.91	0.000	6.212722	8.932311
VT	5.995096	1.129136	5.31	0.000	3.782029	8.208163
WA	5.553984	.6938856	8.00	0.000	4.193993	6.913975
WI	6.570988	.7043368	9.33	0.000	5.190513	7.951463
WV	7.930076	.8253948	9.61	0.000	6.312331	9.547821
WY	10.00267	1.13254	8.83	0.000	7.782935	12.22241
meduc_ru_hs	-.2995061	.1251979	-2.39	0.017	-.5448896	-.0541226
meduc_ru_m~s	-1.518479	.1270313	-11.95	0.000	-1.767456	-1.269502
precare_2t~r	-.3079444	.1310156	-2.35	0.019	-.5647304	-.0511584
precare_3t~r	-.9547624	.2699312	-3.54	0.000	-1.483818	-.4257068
precare_none	20.83167	.4486119	46.44	0.000	19.95241	21.71093
smoked	3.184445	.1482706	21.48	0.000	2.89384	3.475051
county_pov~l	-1.53857	1.312427	-1.17	0.241	-4.11088	1.033739
physici~1000	-.1344004	.0301075	-4.46	0.000	-.1934101	-.0753908
smoked_unk~n	6.01263	.6264878	9.60	0.000	4.784736	7.240524
precare_un~n	7.706865	.2734615	28.18	0.000	7.17089	8.24284
meduc_ru_u~n	13.02209	.3917058	33.24	0.000	12.25436	13.78982
_cons	-.4787298	.6792548	-0.70	0.481	-1.810045	.8525857

reg outcome_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mwhite==1

Correlation Matrix

	out~1000	mblack	married	~ru_lths	me~ru_hs	~ru_mths	precar..	p~2tri~r	p~3tri~r	precar~e	smoked	meduc_..	precar~n	smoked~n
outcome_1000	1.0000													
mblack	0.0336	1.0000												
married	-0.0243	-0.2917	1.0000											
meduc_ru_l~s	0.0095	0.0278	-0.2788	1.0000										
meduc_ru_hs	0.0068	0.0730	-0.1457	-0.3412	1.0000									
meduc_ru_m~s	-0.0199	-0.0930	0.3688	-0.5016	-0.6140	1.0000								
precare_1t~r	-0.0174	-0.1062	0.1960	-0.1731	-0.0352	0.1874	1.0000							
precare_2t~r	0.0001	0.0740	-0.1552	0.1413	0.0374	-0.1511	-0.7860	1.0000						
precare_3t~r	-0.0017	0.0420	-0.0808	0.0811	0.0097	-0.0778	-0.3388	-0.0671	1.0000					
precare_none	0.0357	0.0408	-0.0711	0.0627	0.0051	-0.0624	-0.2069	-0.0410	-0.0177	1.0000				
smoked	0.0160	-0.0283	-0.1684	0.0986	0.0897	-0.1605	-0.0722	0.0585	0.0325	0.0367	1.0000			
meduc_ru_u~n	0.0256	0.0150	-0.0234	-0.0606	-0.0742	-0.1091	-0.0534	0.0007	0.0080	0.0258	-0.0129	1.0000		
precare_un~n	0.0215	0.0376	-0.0302	0.0082	-0.0047	-0.0263	-0.3368	-0.0667	-0.0287	-0.0176	-0.0011	0.1047	1.0000	
smoked_unk~n	-0.0050	-0.0921	-0.0061	0.0736	-0.0076	-0.0699	0.0422	-0.0362	-0.0177	-0.0113	-0.1242	0.0705	-0.0029	1.0000

Table 7.2a Combined factors Model for Neonatal Period (Blacks & Whites)

```
. reg  neonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK
>  AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC S
> D TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county
> _poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mblack==1 | mwhite==1
```

Source	SS	df	MS
Model	62146407	71	875301.507
Residual	1.7335e+10	3838931	4515.65549
Total	1.7397e+10	3839002	4531.76014

Number of obs	= 3839003
F(71,3838931)	= 193.84
Prob > F	= 0.0000
R-squared	= 0.0036
Adj R-squared	= 0.0036
Root MSE	= 67.199

neonata~1000	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	4.338617	.1037328	41.82	0.000	4.135304	4.541929
married	-.8197165	.0868488	-9.44	0.000	-.989937	-.6494959
age_11_16	1.859921	.2867962	6.49	0.000	1.297811	2.422032
age_17_18	.4062709	.1818594	2.23	0.025	.049833	.7627088
age_19_21	-.2228516	.1217038	-1.83	0.067	-.4613868	.0156837
age_22_25	-.2911493	.101999	-2.85	0.004	-.4910637	-.091235
age_31_35	.2731495	.1007693	2.71	0.007	.0756452	.4706537
age_36_40	1.367094	.1334437	10.24	0.000	1.105549	1.628639
age_41_45	2.930473	.2836277	10.33	0.000	2.374573	3.486374
age_46_older	6.228665	1.261702	4.94	0.000	3.755774	8.701555
AK	5.663455	.9546279	5.93	0.000	3.792418	7.534492
AL	8.221674	.5861669	14.03	0.000	7.072808	9.37054
AR	8.276314	.6203785	13.34	0.000	7.060394	9.492234
AZ	8.135682	.558423	14.57	0.000	7.041193	9.230171
CO	8.60203	.5785968	14.87	0.000	7.468001	9.736059
CT	8.213173	.6181643	13.29	0.000	7.001593	9.424753
DC	8.956297	.9359917	9.57	0.000	7.121787	10.79081
DE	8.871104	.8259657	10.74	0.000	7.25224	10.48997
FL	7.4821	.5374428	13.92	0.000	6.428731	8.535468
GA	8.334634	.5468494	15.24	0.000	7.262828	9.406439
HI	8.512695	1.026217	8.30	0.000	6.501346	10.52404
IA	7.546421	.6223033	12.13	0.000	6.326728	8.766113
ID	8.247147	.6858433	12.02	0.000	6.902919	9.591376
IL	8.131311	.5405182	15.04	0.000	7.071915	9.190708
IN	9.047419	.563944	16.04	0.000	7.942109	10.15273
KS	8.833446	.6200142	14.25	0.000	7.61824	10.04865
KY	7.865417	.5908772	13.31	0.000	6.707319	9.023515
LA	8.999069	.583529	15.42	0.000	7.855373	10.14277
MA	7.873598	.5760131	13.67	0.000	6.744632	9.002563
MD	9.040489	.5789359	15.62	0.000	7.905795	10.17518
ME	8.7049	.7728023	11.26	0.000	7.190235	10.21957
MI	8.244546	.5375674	15.34	0.000	7.190933	9.298159
MN	6.831228	.5729644	11.92	0.000	5.708238	7.954218
MO	8.306798	.5690878	14.60	0.000	7.191406	9.42219
MS	8.367992	.6143474	13.62	0.000	7.163893	9.572092
MT	6.757957	.8487875	7.96	0.000	5.094363	8.42155
NC	9.412575	.5517519	17.06	0.000	8.33116	10.49399
ND	9.011086	.9485021	9.50	0.000	7.152056	10.87012
NE	8.82666	.6671227	13.23	0.000	7.519123	10.1342
NH	8.600356	.7685856	11.19	0.000	7.093956	10.10676
NJ	7.410279	.5578469	13.28	0.000	6.316919	8.503639
NM	7.065297	.6673407	10.59	0.000	5.757333	8.373262
NV	6.615247	.6315803	10.47	0.000	5.377372	7.853122
NY	7.925295	.535917	14.79	0.000	6.874917	8.975674
OH	8.046999	.5442114	14.79	0.000	6.980364	9.113634
OK	8.592394	.6018484	14.28	0.000	7.412792	9.771995
OR	8.023934	.6065242	13.23	0.000	6.835168	9.2127
PA	8.057719	.5392322	14.94	0.000	7.000843	9.114595
RI	7.277028	.7929411	9.18	0.000	5.722892	8.831165
SC	9.390156	.5899506	15.92	0.000	8.233874	10.54644
SD	9.360668	.8652398	10.82	0.000	7.664829	11.05651
TN	7.971773	.5694826	14.00	0.000	6.855608	9.087939
TX	7.537803	.527622	14.29	0.000	6.503683	8.571924
UT	7.879768	.5967214	13.21	0.000	6.710215	9.049321
VA	8.56255	.560617	15.27	0.000	7.463761	9.66134
VT	7.174178	.9815223	7.31	0.000	5.25043	9.097927
WA	6.286841	.5703356	11.02	0.000	5.169003	7.404678
WI	8.132017	.5769469	14.09	0.000	7.001221	9.262812
WV	8.803772	.695314	12.66	0.000	7.440981	10.16656
WY	10.44607	.984847	10.61	0.000	8.515807	12.37634
meduc_ru_hs	.3047736	.101664	3.00	0.003	.1055157	.5040315
meduc_ru_m~s	-.4670267	.1042052	-4.48	0.000	-.6712652	-.2627881
precare_2t~r	-1.100918	.1043661	-10.55	0.000	-1.305471	-.8963639
precare_3t~r	-2.363312	.2106569	-11.22	0.000	-2.776192	-1.950432
precare_none	21.88459	.3370939	64.92	0.000	21.22389	22.54528
smoked	1.102088	.1234512	8.93	0.000	.8601284	1.344048
county_pov~l	-1.205053	1.04231	-1.16	0.248	-3.247943	.8378383
physici~1000	-.1136036	.0239526	-4.74	0.000	-.1605499	-.0666573
smoked_unk~n	7.237216	.5075446	14.26	0.000	6.242446	8.231985
precare_un~n	7.815255	.2150649	36.34	0.000	7.393736	8.236775
meduc_ru_u~n	15.5176	.3143037	49.37	0.000	14.90158	16.13363
_cons	-3.730403	.5498774	-6.78	0.000	-4.808143	-2.652663

reg neonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mblack==1 | mwhite==1

7.2b Combined factors Model for Neonatal Period (Blacks)

```
. reg  neonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK
>  AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC S
> D TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county
> _poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mblack==1
```

Source	SS	df	MS
Model	30206573.2	70	431522.474
Residual	5.3844e+09	616003	8740.78632
Total	5.4146e+09	616073	8788.824

Number of obs	=	616074
F(70,616003)	=	49.37
Prob > F	=	0.0000
R-squared	=	0.0056
Adj R-squared	=	0.0055
Root MSE	=	93.492

neonata~1000	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	(dropped)					
married	-1.46811	.2956921	-4.96	0.000	-2.047657	-.8885628
age_11_16	.8737941	.7538724	1.16	0.246	-.6037715	2.35136
age_17_18	-.4880723	.5347854	-0.91	0.361	-1.536235	.5600899
age_19_21	-1.777541	.3887966	-4.57	0.000	-2.53957	-1.015512
age_22_25	-1.575376	.3544675	-4.44	0.000	-2.270121	-.8806312
age_31_35	.798885	.4047815	1.97	0.048	.0055262	1.592244
age_36_40	1.208708	.529876	2.28	0.023	.170168	2.247248
age_41_45	2.869137	1.087249	2.64	0.008	.7381634	5.00011
age_46_older	2.3887	5.201601	0.46	0.646	-7.806271	12.58367
AK	19.23138	4.992713	3.85	0.000	9.445824	29.01694
AL	20.12399	1.848657	10.89	0.000	16.50068	23.74729
AR	18.52363	2.026274	9.14	0.000	14.55219	22.49506
AZ	16.43224	2.32835	7.06	0.000	11.86875	20.99573
CO	21.0536	2.435842	8.64	0.000	16.27943	25.82777
CT	19.97234	2.148207	9.30	0.000	15.76192	24.18275
DC	19.97382	2.185201	9.14	0.000	15.6909	24.25674
DE	21.1479	2.438245	8.67	0.000	16.36902	25.92678
FL	18.54249	1.765825	10.50	0.000	15.08152	22.00345
GA	20.95815	1.766089	11.87	0.000	17.49667	24.41963
HI	23.98996	4.270302	5.62	0.000	15.62031	32.35961
IA	14.4038	2.973077	4.84	0.000	8.576667	20.23094
ID	10.86563	9.078732	1.20	0.231	-6.928388	28.65966
IL	19.97025	1.788474	11.17	0.000	16.4649	23.4756
IN	22.07014	1.95614	11.28	0.000	18.23617	25.90411
KS	18.88684	2.450118	7.71	0.000	14.08469	23.689
KY	19.57836	2.17214	9.01	0.000	15.32103	23.83568
LA	21.39076	1.818706	11.76	0.000	17.82615	24.95536
MA	19.13229	2.007031	9.53	0.000	15.19857	23.066
MD	21.34105	1.817174	11.74	0.000	17.77945	24.90266
ME	25.48564	6.464324	3.94	0.000	12.81578	38.15551
MI	20.95451	1.796402	11.66	0.000	17.43362	24.4754
MN	13.55462	2.027317	6.69	0.000	9.581142	17.52809
MO	19.49981	1.921914	10.15	0.000	15.73292	23.2667
MS	21.14037	1.854233	11.40	0.000	17.50613	24.77461
MT	12.45858	12.95575	0.96	0.336	-12.93427	37.85144
NC	23.4581	1.799179	13.04	0.000	19.93176	26.98443
ND	11.89435	9.695714	1.23	0.220	-7.108935	30.89764
NE	21.23227	2.91734	7.28	0.000	15.51437	26.95016
NH	29.64609	6.092762	4.87	0.000	17.70447	41.5877
NJ	18.44136	1.837677	10.04	0.000	14.83957	22.04315
NM	15.26236	4.503015	3.39	0.001	6.436591	24.08812
NV	18.40718	2.413549	7.63	0.000	13.6767	23.13765
NY	19.39136	1.773317	10.94	0.000	15.91571	22.867
OH	19.8513	1.81378	10.94	0.000	16.29635	23.40624
OK	20.946	2.169679	9.65	0.000	16.6935	25.1985
OR	16.1583	3.336928	4.84	0.000	9.618025	22.69857
PA	18.40408	1.763649	10.44	0.000	14.94739	21.86077
RI	12.80577	3.156146	4.06	0.000	6.61982	18.99171
SC	22.16032	1.837956	12.06	0.000	18.55799	25.76266
SD	19.45796	7.899717	2.46	0.014	3.974767	34.94115
TN	20.55618	1.859901	11.05	0.000	16.91084	24.20153
TX	18.43406	1.770508	10.41	0.000	14.96392	21.9042
UT	18.5741	4.791901	3.88	0.000	9.182129	27.96607
VA	21.17157	1.824245	11.61	0.000	17.59611	24.74704
VT	11.1305	12.29393	0.91	0.365	-12.9652	35.2262
WA	13.80203	2.233219	6.18	0.000	9.424991	18.17907
WI	23.59605	2.065269	11.43	0.000	19.54819	27.64391
WV	17.70574	3.993896	4.43	0.000	9.877837	25.53365
WY	12.65573	12.72276	0.99	0.320	-12.28048	37.59193
meduc_ru_hs	1.870255	.3354285	5.58	0.000	1.212826	2.527684
meduc_ru_m~s	1.269429	.3632962	3.49	0.000	.5573805	1.981478
precare_2t~r	-2.723321	.3144676	-8.66	0.000	-3.339668	-2.106975
precare_3t~r	-5.439155	.5923826	-9.18	0.000	-6.600206	-4.278104
precare_none	31.86282	.858685	37.11	0.000	30.17983	33.54582
smoked	1.510182	.4679424	3.23	0.001	.5930299	2.427334
county_pov~l	-3.743992	3.428558	-1.09	0.275	-10.46385	2.975871
physici~1000	-.1200094	.0752585	-1.59	0.111	-.2675136	.0274949
smoked_unk~n	18.05519	1.637276	11.03	0.000	14.84619	21.2642
precare_un~n	10.89554	.6234448	17.48	0.000	9.673611	12.11747
meduc_ru_u~n	25.99647	.9748355	26.67	0.000	24.08583	27.90712
_cons	-11.2614	1.831551	-6.15	0.000	-14.85118	-7.671618

reg neonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mblack==1

7.2c Combined factors Model for Neonatal Period (Whites)

```
. reg  neonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK
>  AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC S
> D TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county
> _poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mwhite==1
```

Source	SS	df	MS
Model	25122425.3	70	358891.79
Residual	1.1944e+10	3222858	3706.05637
Total	1.1969e+10	3222928	3713.77078

Number of obs	3222929
F(70,3222858)	96.84
Prob > F	0.0000
R-squared	0.0021
Adj R-squared	0.0021
Root MSE	60.877

neonata~1000	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	(dropped)					
married	-.6447421	.086573	-7.45	0.000	-.8144221	-.4750621
age_11_16	2.552746	.3109418	8.21	0.000	1.943311	3.162181
age_17_18	.741611	.1885303	3.93	0.000	.3720982	1.111124
age_19_21	.1674833	.1231306	1.36	0.174	-.0738483	.4088149
age_22_25	-.0427532	.1010062	-0.42	0.672	-.2407218	.1552155
age_31_35	.2255867	.0973841	2.32	0.021	.0347173	.416456
age_36_40	1.392702	.1291511	10.78	0.000	1.13957	1.645833
age_41_45	2.929335	.2757922	10.62	0.000	2.388792	3.469878
age_46_older	6.815697	1.214296	5.61	0.000	4.43572	9.195675
AK	3.343671	.9106971	3.67	0.000	1.558737	5.128605
AL	5.98502	.5992565	9.99	0.000	4.810499	7.159542
AR	6.30211	.6235815	10.11	0.000	5.079912	7.524308
AZ	5.966983	.5527864	10.79	0.000	4.883542	7.050425
CO	6.178926	.5716901	10.81	0.000	5.058434	7.299419
CT	5.853354	.6146987	9.52	0.000	4.648566	7.058142
DC	6.033167	1.377747	4.38	0.000	3.332832	8.733502
DE	6.291042	.8563533	7.35	0.000	4.61262	7.969464
FL	5.369123	.5403615	9.94	0.000	4.310034	6.428213
GA	5.584965	.554377	10.07	0.000	4.498406	6.671524
HI	5.738389	.992659	5.78	0.000	3.792812	7.683965
IA	5.393721	.6096103	8.85	0.000	4.198907	6.588536
ID	5.890013	.6602952	8.92	0.000	4.595858	7.184168
IL	5.784985	.5423591	10.67	0.000	4.72198	6.847989
IN	6.52263	.5621244	11.60	0.000	5.420886	7.624374
KS	6.591315	.6106011	10.79	0.000	5.394559	7.788072
KY	5.472199	.5854093	9.35	0.000	4.324817	6.61958
LA	6.565515	.6080244	10.80	0.000	5.373809	7.757222
MA	5.60486	.5734893	9.77	0.000	4.480842	6.728879
MD	6.224625	.5967559	10.43	0.000	5.055004	7.394245
ME	6.279458	.7376422	8.51	0.000	4.833705	7.725211
MI	5.702788	.5382637	10.59	0.000	4.64781	6.757766
MN	5.019698	.5702274	8.80	0.000	3.902073	6.137324
MO	6.055635	.5688726	10.64	0.000	4.940665	7.170605
MS	5.635442	.6544645	8.61	0.000	4.352715	6.91817
MT	4.426024	.8013244	5.52	0.000	2.855456	5.996592
NC	6.362303	.5557343	11.45	0.000	5.273083	7.451523
ND	6.788121	.8915382	7.61	0.000	5.040737	8.535504
NE	6.400093	.6516744	9.82	0.000	5.122834	7.677352
NH	6.144691	.7349853	8.36	0.000	4.704146	7.585236
NJ	5.194946	.5602307	9.27	0.000	4.096913	6.292978
NM	4.869669	.6455922	7.54	0.000	3.604331	6.135007
NV	4.342542	.6219884	6.98	0.000	3.123467	5.561618
NY	5.701871	.5380972	10.60	0.000	4.64722	6.756522
OH	5.630406	.5454122	10.32	0.000	4.561417	6.699395
OK	6.145366	.5965457	10.30	0.000	4.976158	7.314575
OR	5.75012	.5937946	9.68	0.000	4.586304	6.913937
PA	5.903238	.5429741	10.87	0.000	4.839028	6.967448
RI	5.626723	.7738125	7.27	0.000	4.110078	7.143369
SC	6.764768	.6090287	11.11	0.000	5.571093	7.958443
SD	7.008416	.8185941	8.56	0.000	5.404	8.612831
TN	5.382902	.5732402	9.39	0.000	4.259371	6.506432
TX	5.277502	.5283198	9.99	0.000	4.242013	6.31299
UT	5.515913	.5848319	9.43	0.000	4.369664	6.662163
VA	5.960537	.564998	10.55	0.000	4.853161	7.067913
VT	4.931113	.919535	5.36	0.000	3.128856	6.733369
WA	4.252085	.5650798	7.52	0.000	3.144548	5.359621
WI	5.423433	.5735909	9.46	0.000	4.299215	6.547651
WV	6.542207	.672177	9.73	0.000	5.224764	7.85965
WY	8.173584	.922307	8.86	0.000	6.365894	9.981273
meduc_ru_hs	.0076158	.1019575	0.07	0.940	-.1922173	.2074488
meduc_ru_m~s	-.743592	.1034505	-7.19	0.000	-.9463513	-.5408327
precare_2t~r	-.6365303	.1066952	-5.97	0.000	-.8456492	-.4274114
precare_3t~r	-1.342096	.2198239	-6.11	0.000	-1.772943	-.9112491
precare_none	17.38848	.3653362	47.60	0.000	16.67243	18.10453
smoked	1.002257	.1207472	8.30	0.000	.7655968	1.238917
county_pov~l	-1.360181	1.068801	-1.27	0.203	-3.454993	.7346316
physici~1000	-.099966	.0245187	-4.08	0.000	-.1480217	-.0519103
smoked_unk~n	4.933653	.510193	9.67	0.000	3.933693	5.933614
precare_un~n	6.78384	.2226989	30.46	0.000	6.347358	7.220322
meduc_ru_u~n	12.81689	.3189935	40.18	0.000	12.19168	13.44211
_cons	-1.387068	.5531649	-2.51	0.012	-2.471251	-.3028838

reg neonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if mwhite==1

7.3a Combined factors Model for Postneonatal Period (Blacks & Whites)

```
. reg  postneonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older
>  AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC
>  SD TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked count
> y_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if neonatal != 1 &  (mwhite==1 | mbl
> ack==1)
```

Source	SS	df	MS
Model	9852350.29	71	138765.497
Residual	8.7709e+09	3821454	2295.16799
Total	8.7807e+09	3821525	2297.70347

Number of obs	= 3821526
F(71,3821454)	= 60.46
Prob > F	= 0.0000
R-squared	= 0.0011
Adj R-squared	= 0.0011
Root MSE	= 47.908

postneo~1000	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	1.907494	.0742266	25.70	0.000	1.762012	2.052975
married	-.519148	.0620706	-8.36	0.000	-.6408041	-.3974918
age_11_16	1.242056	.2052207	6.05	0.000	.8398308	1.644281
age_17_18	.335462	.130023	2.58	0.010	.0806215	.5903026
age_19_21	.8018081	.0869767	9.22	0.000	.6313369	.9722793
age_22_25	.3456351	.0728757	4.74	0.000	.2028013	.488469
age_31_35	.018269	.0719879	0.25	0.800	-.1228246	.1593627
age_36_40	.0605895	.0953719	0.64	0.525	-.126336	.247515
age_41_45	.7277493	.202897	3.59	0.000	.3300783	1.12542
age_46_older	.6971982	.904274	0.77	0.441	-1.075147	2.469543
AK	2.192213	.6829165	3.21	0.001	.8537204	3.530705
AL	2.880726	.4207869	6.85	0.000	2.055998	3.705453
AR	2.399717	.4451261	5.39	0.000	1.527286	3.272149
AZ	1.760536	.4009765	4.39	0.000	.9746366	2.546436
CO	1.599909	.4153783	3.85	0.000	.7857824	2.414036
CT	1.39833	.443505	3.15	0.002	.5290759	2.267584
DC	2.064211	.6709999	3.08	0.002	.7490748	3.379347
DE	2.501907	.5917926	4.23	0.000	1.342014	3.661799
FL	2.05381	.3861036	5.32	0.000	1.297061	2.81056
GA	2.230775	.392847	5.68	0.000	1.460808	3.000741
HI	1.117197	.7344342	1.52	0.128	-.3222684	2.556662
IA	1.98367	.4463857	4.44	0.000	1.108769	2.85857
ID	1.790345	.4916208	3.64	0.000	.8267859	2.753905
IL	2.176487	.388307	5.61	0.000	1.415419	2.937555
IN	2.078543	.404971	5.13	0.000	1.284814	2.872272
KS	2.558071	.4448503	5.75	0.000	1.68618	3.429962
KY	2.279498	.4240739	5.38	0.000	1.448328	3.110668
LA	3.201421	.4189335	7.64	0.000	2.380326	4.022515
MA	1.216535	.4135251	2.94	0.003	.40604	2.027029
MD	1.896547	.4156884	4.56	0.000	1.081813	2.711282
ME	1.649796	.5536166	2.98	0.003	.5647269	2.734865
MI	1.851852	.3861051	4.80	0.000	1.0951	2.608605
MN	1.401531	.4112679	3.41	0.001	.5954601	2.207601
MO	1.907617	.408624	4.67	0.000	1.106728	2.708506
MS	2.74306	.4409106	6.22	0.000	1.878891	3.607229
MT	2.144511	.6073688	3.53	0.000	.9540895	3.334932
NC	2.124799	.3963284	5.36	0.000	1.348009	2.901589
ND	1.424994	.6788897	2.10	0.036	.0943942	2.755594
NE	1.689253	.4783628	3.53	0.000	.7516788	2.626827
NH	1.201222	.5506449	2.18	0.029	.1219774	2.280467
NJ	1.419062	.4006073	3.54	0.000	.6338855	2.204238
NM	1.901682	.4784606	3.97	0.000	.9639166	2.839448
NV	1.37714	.4529903	3.04	0.002	.4892951	2.264985
NY	1.514692	.3850205	3.93	0.000	.7600654	2.269319
OH	2.265293	.3909349	5.79	0.000	1.499075	3.031512
OK	2.430835	.431911	5.63	0.000	1.584305	3.277366
OR	1.815727	.4352126	4.17	0.000	.9627261	2.668729
PA	1.797051	.3874715	4.64	0.000	1.03762	2.556481
RI	1.161632	.5679208	2.05	0.041	.0485269	2.274736
SC	2.175606	.4235454	5.14	0.000	1.345472	3.00574
SD	1.866827	.6195925	3.01	0.003	.6524473	3.081206
TN	2.182412	.4089387	5.34	0.000	1.380906	2.983917
TX	1.885841	.3791204	4.97	0.000	1.142778	2.628904
UT	1.716643	.4281719	4.01	0.000	.8774407	2.555844
VA	2.169175	.4026061	5.39	0.000	1.380081	2.958268
VT	1.636072	.7020669	2.33	0.020	.2600457	3.012098
WA	1.79237	.4094377	4.38	0.000	.9898862	2.594853
WI	2.047415	.4141847	4.94	0.000	1.235628	2.859202
WV	1.924341	.4985004	3.86	0.000	.9472981	2.901384
WY	2.409579	.7052954	3.42	0.001	1.027225	3.791933
meduc_ru_hs	-.4407418	.0726555	-6.07	0.000	-.5831441	-.2983395
meduc_ru_m~s	-.9257995	.0744612	-12.43	0.000	-1.071741	-.7798583
precare_2t~r	.321455	.0745533	4.31	0.000	.1753332	.4675768
precare_3t~r	.3711222	.1504035	2.47	0.014	.0763367	.6659077
precare_none	4.246006	.2436553	17.43	0.000	3.76845	4.723562
smoked	2.452697	.0882642	27.79	0.000	2.279703	2.625692
county_pov~l	.4698482	.7447306	0.63	0.528	-.9897975	1.929494
physici~1000	-.0385904	.0171166	-2.25	0.024	-.0721384	-.0050425
smoked_unk~n	1.704495	.3648709	4.67	0.000	.989361	2.419629
precare_un~n	1.183181	.1542896	7.67	0.000	.880779	1.485583
meduc_ru_u~n	-.0572733	.2263344	-0.25	0.800	-.5008808	.3863342
_cons	.4069911	.3949752	1.03	0.303	-.3671463	1.181128

reg postneonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if neonatal != 1 & (mwhite==1 | mblack==1)

7.3b Combined factors Model for Postneonatal Period (Blacks)

```
. reg  postneonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older
>  AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC
>  SD TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked count
> y_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if neonatal != 1 &  mblack==1
```

Source	SS	df	MS
Model	2493551.87	70	35622.1695
Residual	2.6479e+09	610540	4336.98247
Total	2.6504e+09	610610	4340.56899

Number of obs =	610611
F(70,610540) =	8.21
Prob > F =	0.0000
R-squared =	0.0009
Adj R-squared =	0.0008
Root MSE =	65.856

postneo~1000	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	(dropped)					
married	-.9185548	.2091972	-4.39	0.000	-1.328575	-.508535
age_11_16	.5726455	.5335573	1.07	0.283	-.4731097	1.618401
age_17_18	-.7571319	.3784269	-2.00	0.045	-1.498837	-.0154272
age_19_21	.3584659	.2750772	1.30	0.193	-.1806766	.8976084
age_22_25	.4291797	.2507946	1.71	0.087	-.0623696	.920729
age_31_35	.0442417	.2865192	0.15	0.877	-.5173266	.6058101
age_36_40	.2059728	.3751808	0.55	0.583	-.5293694	.941315
age_41_45	.8845253	.7706057	1.15	0.251	-.6258372	2.394888
age_46_older	-.2272451	3.686829	-0.06	0.951	-7.453311	6.998821
AK	13.40261	3.539189	3.79	0.000	6.46591	20.3393
AL	5.34998	1.321296	4.05	0.000	2.760282	7.939678
AR	4.751822	1.445574	3.29	0.001	1.918544	7.5851
AZ	3.057232	1.656481	1.85	0.065	-.1894175	6.303881
CO	5.596549	1.733843	3.23	0.001	2.198274	8.994825
CT	4.461688	1.531366	2.91	0.004	1.460259	7.463117
DC	4.786707	1.55777	3.07	0.002	1.733528	7.839887
DE	5.389568	1.73588	3.10	0.002	1.987299	8.791837
FL	4.661575	1.263165	3.69	0.000	2.185813	7.137337
GA	4.836246	1.263656	3.83	0.000	2.35952	7.312972
HI	6.515433	3.031434	2.15	0.032	.5739187	12.45695
IA	3.047959	2.107448	1.45	0.148	-1.082571	7.178489
ID	.4157291	6.398787	0.06	0.948	-12.12569	12.95715
IL	5.015989	1.279191	3.92	0.000	2.508815	7.523162
IN	4.58159	1.396919	3.28	0.001	1.843673	7.319507
KS	5.622732	1.742922	3.23	0.001	2.206661	9.038803
KY	4.70419	1.54803	3.04	0.002	1.670101	7.738278
LA	5.204902	1.300384	4.00	0.000	2.656192	7.753612
MA	2.664683	1.431936	1.86	0.063	-.1418652	5.471232
MD	4.208185	1.299295	3.24	0.001	1.66161	6.754761
ME	.7101365	4.587147	0.15	0.877	-8.280524	9.700797
MI	4.682222	1.28422	3.65	0.000	2.165192	7.199251
MN	3.193618	1.44442	2.21	0.027	.3626013	6.024634
MO	4.627398	1.372521	3.37	0.001	1.9373	7.317495
MS	5.369913	1.325277	4.05	0.000	2.772413	7.967413
MT	-.0824628	9.128649	-0.01	0.993	-17.97432	17.8094
NC	4.64808	1.287	3.61	0.000	2.125601	7.17056
ND	11.29605	6.833161	1.65	0.098	-2.096728	24.68882
NE	3.932216	2.072612	1.90	0.058	-.1300369	7.994468
NH	.8133104	4.336295	0.19	0.851	-7.685688	9.312309
NJ	3.03962	1.313512	2.31	0.021	.4651783	5.614062
NM	3.92412	3.184645	1.23	0.218	-2.317681	10.16592
NV	4.179688	1.717987	2.43	0.015	.8124883	7.546887
NY	3.898096	1.268535	3.07	0.002	1.411809	6.384383
OH	4.624211	1.296873	3.57	0.000	2.082381	7.166041
OK	4.118406	1.54665	2.66	0.008	1.087021	7.149791
OR	3.721607	2.364601	1.57	0.116	-.912935	8.356149
PA	3.471258	1.262057	2.75	0.006	.9976673	5.944848
RI	4.024848	2.236491	1.80	0.072	-.3586019	8.408298
SC	4.809323	1.313903	3.66	0.000	2.234116	7.384531
SD	-.0949993	5.586957	-0.02	0.986	-11.04525	10.85526
TN	3.861652	1.329649	2.90	0.004	1.255583	6.467722
TX	4.620413	1.266514	3.65	0.000	2.138087	7.102739
UT	7.092082	3.392433	2.09	0.037	.4430219	13.74114
VA	4.565962	1.304185	3.50	0.000	2.009803	7.122122
VT	.0926458	8.662604	0.01	0.991	-16.88578	17.07107
WA	2.786087	1.58975	1.75	0.080	-.3297715	5.901945
WI	6.87362	1.473914	4.66	0.000	3.984797	9.762443
WV	3.769078	2.830373	1.33	0.183	-1.778363	9.316519
WY	.5733934	8.964576	0.06	0.949	-16.99689	18.14367
meduc_ru_hs	-1.039084	.2372469	-4.38	0.000	-1.504081	-.574088
meduc_ru_m~s	-1.714426	.2569521	-6.67	0.000	-2.218044	-1.210809
precare_2t~r	.3757579	.2222222	1.69	0.091	-.0597906	.8113063
precare_3t~r	.4229389	.4180039	1.01	0.312	-.3963354	1.242213
precare_none	5.665819	.6173676	9.18	0.000	4.455798	6.875839
smoked	3.950311	.331421	11.92	0.000	3.300737	4.599886
county_pov~l	2.79042	2.424817	1.15	0.250	-1.962144	7.542983
physici~1000	-.0571291	.0532379	-1.07	0.283	-.1614736	.0472154
smoked_unk~n	4.654356	1.173476	3.97	0.000	2.354381	6.954332
precare_un~n	2.104397	.4434552	4.75	0.000	1.235239	2.973555
meduc_ru_u~n	-1.487918	.6983219	-2.13	0.033	-2.856607	-.11923
_cons	.1834537	1.309114	0.14	0.889	-2.382367	2.749275

reg postneonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if neonatal != 1 & mblack==1

7.3c Combined factors Model for Postneonatal Period (Whites)

```
. reg  postneonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older
>  AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC
>  SD TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked count
> y_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if neonatal != 1 &  mwhite==1

      Source |       SS       df       MS              Number of obs = 3210915
-------------+------------------------------           F( 70,3210844) =   36.74
       Model |  4903719.76    70  70053.1395           Prob > F      =  0.0000
    Residual |  6.1224e+093210844  1906.77561           R-squared     =  0.0008
-------------+------------------------------           Adj R-squared =  0.0008
       Total |  6.1273e+093210914  1908.26125           Root MSE      =  43.667

------------------------------------------------------------------------------
postneo~1000 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      mblack |  (dropped)
     married |  -.4351403    .062227    -6.99   0.000     -.557103   -.3131775
   age_11_16 |   1.393335    .223771     6.23   0.000     .9547518    1.831918
   age_17_18 |   .6782344   .1355511     5.00   0.000      .412559    .9439098
   age_19_21 |   .9384168   .0884941    10.60   0.000     .7649715    1.111862
   age_22_25 |   .3342426   .0725766     4.61   0.000     .1919949    .4764903
   age_31_35 |    .004814    .069968     0.07   0.945    -.1323207    .1419488
   age_36_40 |    .030488   .0928332     0.33   0.743    -.1514617    .2124377
   age_41_45 |   .6977062   .1984142     3.52   0.000     .3088213    1.086591
age_46_older |   .8160792    .875514     0.93   0.351    -.8998973    2.532056
          AK |   1.079927   .6550984     1.65   0.099    -.2040432    2.363896
          AL |   2.349873   .4320263     5.44   0.000     1.503117     3.19663
          AR |    1.87496   .4494846     4.17   0.000     .9939856    2.755934
          AZ |   1.271274   .3987245     3.19   0.001     .4897882     2.05276
          CO |   .9447424   .4123013     2.29   0.022     .1366464    1.752838
          CT |   .7204794   .4430666     1.63   0.104    -.1479156    1.588874
          DC |   .7542496    .990573     0.76   0.446    -1.187238    2.695738
          DE |   1.795155   .6164692     2.91   0.004      .586897    3.003413
          FL |   1.455051   .3898369     3.73   0.000      .690984    2.219117
          GA |   1.652079   .3998974     4.13   0.000     .8682945    2.435864
          HI |    .219067   .7142407     0.31   0.759    -1.180819    1.618954
          IA |   1.455044   .4394138     3.31   0.001     .5938086     2.31628
          ID |   1.225303   .4757601     2.58   0.010     .2928301    2.157776
          IL |   1.503798   .3912753     3.84   0.000     .7369118    2.270684
          IN |   1.500542   .4054421     3.70   0.000       .70589    2.295194
          KS |   1.922964   .4401905     4.37   0.000     1.060206    2.785722
          KY |   1.753093   .4220827     4.15   0.000     .9258261    2.580361
          LA |   2.940462   .4383092     6.71   0.000     2.081392    3.799533
          MA |   .7736132   .4135728     1.87   0.061    -.0369749    1.584201
          MD |   1.488907   .4302543     3.46   0.001     .6456241    2.332191
          ME |   1.130189    .531259     2.13   0.033     .0889399    2.171438
          MI |    1.17847   .3882714     3.04   0.002      .417472    1.939469
          MN |   .8740654   .4111933     2.13   0.034     .0681411     1.67999
          MO |   1.292151   .4102807     3.15   0.002     .4880151    2.096286
          MS |   2.022971    .471597     4.29   0.000     1.098657    2.947284
          MT |   1.606033    .576621     2.79   0.005     .4758763     2.73619
          NC |   1.550232   .4008567     3.87   0.000     .7645675    2.335897
          ND |   .7312454   .6417523     1.14   0.255    -.5265665    1.989057
          NE |   1.111319   .4696087     2.37   0.018     .1909028    2.031736
          NH |   .6489575   .5293665     1.23   0.220    -.3885821    1.686497
          NJ |   1.027367   .4040501     2.54   0.011     .2354427    1.819291
          NM |     1.3841    .465245     2.97   0.003     .4722366    2.295964
          NV |    .797641   .4482618     1.78   0.075    -.0809363    1.676218
          NY |   .9471178   .3882155     2.44   0.015     .1862292    1.708006
          OH |   1.704179   .3934646     4.33   0.000     .9330024    2.475356
          OK |   1.967201   .4300846     4.57   0.000     1.124251    2.810152
          OR |   1.265147   .4281364     2.96   0.003     .4260152     2.10428
          PA |   1.317574   .3917603     3.36   0.001     .5497379     2.08541
          RI |   .5289326   .5572098     0.95   0.342    -.5631789    1.621044
          SC |    1.52376   .4390809     3.47   0.001     .6631766    2.384343
          SD |   1.366604   .5894411     2.32   0.020     .2113206    2.521888
          TN |   1.806298    .413389     4.37   0.000     .9960702    2.616526
          TX |   1.320292   .3812127     3.46   0.001     .5731288    2.067456
          UT |   1.081189   .4216435     2.56   0.010     .2547829    1.907596
          VA |   1.644531   .4074879     4.04   0.000     .8458692    2.443193
          VT |   1.090921   .6615113     1.65   0.099    -.2056175     2.38746
          WA |   1.328199   .4075184     3.26   0.001     .5294769     2.12692
          WI |   1.176801   .4136164     2.85   0.004     .3661279    1.987475
          WV |   1.421337   .4843925     2.93   0.003     .4719445    2.370729
          WY |   1.867204   .6642694     2.81   0.005     .5652592    3.169148
 meduc_ru_hs |  -.3082298    .073283    -4.21   0.000    -.4518618   -.1645978
meduc_ru_m~s |  -.7786539   .0743478   -10.47   0.000    -.9243729   -.6329349
precare_2t~r |   .3277749   .0766578     4.28   0.000     .1775282    .4780215
precare_3t~r |    .384133   .1578955     2.43   0.015     .0746633    .6936027
precare_none |   3.570495   .2649062    13.48   0.000     3.051288    4.089702
      smoked |   2.196159   .0868222    25.29   0.000     2.025991    2.366328
county_pov~l |  -.1851909   .7679308    -0.24   0.809    -1.690308    1.319926
physici~1000 |  -.0347096   .0176189    -1.97   0.049    -.0692419   -.0001772
smoked_unk~n |    1.10589   .3682472     3.00   0.003     .3841387    1.827642
precare_un~n |   .9478016   .1605708     5.90   0.000     .6330885    1.262515
meduc_ru_u~n |   .2509262   .2307073     1.09   0.277    -.2012519    .7031043
       _cons |   .8887111   .3990274     2.23   0.026     .1066315    1.670791
------------------------------------------------------------------------------
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reg postneonatal_1000 mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths precare_2trimestr precare_3trimestr precare_none smoked county_poverty_level physicians_per_1000 smoked_unknown precare_unknown meduc_ru_unknown if neonatal != 1 & mwhite==1

Appendix B. Factors associated with starting prenatal care in first trimester

Prenatal care from the 1^{st} *trimester = a + b * Mother is Black +* P_i *Married +* E_i *Education Level +* D_i *Birthday Sept-Dec + Ki State +* L_i *Age Group +* S_i *Smoked + u* (Equation 7.1)

Table 4a. Prenatal care started in 1^{st} trimester

Section 4.	Blacks and Whites		Blacks Only		Whites Only	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
mblack	-.067	.00058				
BD Sept-to-Dec	.00166	.0004	.0094	.0012	.00021	.00044
married	.082	.0005	.075	.0014	.084	.0004
high school	.093	.0006	.06	.0016	.097	.0006
more than HS	.154	.0006	.13	.0017	.155	.00062
smoked	-.035	.0007	-.084	.0022	-.028	.0007
smoked unknown	-.1926	.0029	-.164	.0076	-.194	.003
educ unknown	-.075	.0018	-.134	.0045	-.061	.0019
cons	.93	.003	.895	.008	.92	.003

R^2 = 0.0852 (This highest R^2 in the paper. Rests of the models have R^2 less than 0.005. Reason is, it's almost impossible to predict particular death based socioeconomic variables. From other side whether or not mother will start prenatal in the 1^{st} trimester is more predictable).

Results showed that being married and having higher level of education associated with early start in prenatal care, while smoking during the pregnancy associated with postponing prenatal care.

When baby was born between September and December (variable BD Sep-to-Dec), mother more likely to start prenatal care from the first trimester. Idea behind it is that health insurance detectable resets every new calendar year. Mother who knows that baby is going to be born same calendar year as she got pregnant (born between September to December) will more likely to use prenatal care from the first trimester. Due to large hospital bill at time of the delivery, she will likely to meet her annual deductible anyway. Thus starting prenatal care early would not increase her annual out-of-pocket expenditures to more than co-insurance premium (usually around 20% of the insurer adjusted medical bill). Effect is small in magnitude, but statistically significant among black mothers. Among white mothers effect is not statistically significant.

Based on results one could speculate that black mothers are more likely to start prenatal care based on annual health insurance payments schedule than white mothers. This follows from budget constraint analysis. On average blacks optimize around smaller budget leading them to choose bundle with less prenatal care. When part of prenatal care cost can be avoided blacks more likely to do so compare to whites.

Table 4.1a Prenatal care started in the 1st trimester (Blacks & Whites)

```
. reg  precare_1trimestr  bd_sept_to_dec mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41
> _45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY O
> H OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths smoked meduc_ru_unknown smoked_unknown if mwh
> ite==1 | mblack==1
```

Source	SS	df	MS
Model	57621.011	66	873.045621
Residual	559406.466	3838936	.145719144
Total	617027.477	3839002	.160726011

Number of obs	= 3839003
F(66,3838936)	= 5991.29
Prob > F	= 0.0000
R-squared	= 0.0934
Adj R-squared	= 0.0934
Root MSE	= .38173

precare_1t~r	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bd_sept_to~c	.0016639	.0004124	4.03	0.000	.0008556	.0024723
mblack	-.0669192	.0005798	-115.41	0.000	-.0680556	-.0657828
married	.0820989	.0004908	167.29	0.000	.081137	.0830607
age_11_16	-.089194	.0016282	-54.78	0.000	-.0923853	-.0860027
age_17_18	-.0379766	.0010326	-36.78	0.000	-.0400004	-.0359527
age_19_21	-.039833	.0006908	-57.66	0.000	-.0411869	-.0384792
age_22_25	-.0205679	.0005792	-35.51	0.000	-.0217031	-.0194327
age_31_35	.005337	.000572	9.33	0.000	.004216	.0064581
age_36_40	-.0051229	.0007572	-6.77	0.000	-.006607	-.0036387
age_41_45	-.0355094	.0016106	-22.05	0.000	-.0386662	-.0323526
age_46_older	-.0612401	.0071669	-8.54	0.000	-.0752869	-.0471933
AK	-.2742345	.0054099	-50.69	0.000	-.2848376	-.2636314
AL	-.2020857	.0033169	-60.93	0.000	-.2085868	-.1955846
AR	-.2308556	.0035114	-65.74	0.000	-.2377379	-.2239733
AZ	-.2756254	.0031607	-87.20	0.000	-.2818203	-.2694306
CO	-.2805487	.0032703	-85.79	0.000	-.2869584	-.2741391
CT	-.2166792	.0034881	-62.12	0.000	-.2235158	-.2098427
DC	-.2986589	.005258	-56.80	0.000	-.3089644	-.2883534
DE	-.1929006	.004679	-41.23	0.000	-.2020714	-.1837299
FL	-.3289022	.003035	-108.37	0.000	-.3348506	-.3229537
GA	-.207202	.003095	-66.95	0.000	-.2132681	-.201136
HI	-.2554456	.005816	-43.92	0.000	-.2668448	-.2440463
IA	-.1969605	.0035215	-55.93	0.000	-.2038625	-.1900584
ID	-.3698459	.0038831	-95.24	0.000	-.3774566	-.3622351
IL	-.2444025	.0030535	-80.04	0.000	-.2503872	-.2384178
IN	-.2532056	.0031899	-79.38	0.000	-.2594576	-.2469536
KS	-.2096712	.0035099	-59.74	0.000	-.2165505	-.2027919
KY	-.3161083	.0033404	-94.63	0.000	-.3226554	-.3095613
LA	-.1667016	.0032856	-50.74	0.000	-.1731413	-.1602619
MA	-.2075185	.0032385	-64.08	0.000	-.2138658	-.2011712
MD	-.2467809	.0032595	-75.71	0.000	-.2531695	-.2403924
ME	-.196958	.004381	-44.96	0.000	-.2055447	-.1883714
MI	-.2224209	.0030405	-73.15	0.000	-.2283803	-.2164616
MN	-.2421055	.0032261	-75.05	0.000	-.2484286	-.2357825
MO	-.1894518	.0032213	-58.81	0.000	-.1957655	-.1831381
MS	-.1952675	.0034624	-56.40	0.000	-.2020537	-.1884813
MT	-.226525	.0048149	-47.05	0.000	-.2359621	-.217088
NC	-.2125564	.0031241	-68.04	0.000	-.2186796	-.2064333
ND	-.2293822	.0053798	-42.64	0.000	-.2399265	-.2188379
NE	-.2504778	.0037759	-66.34	0.000	-.2578785	-.2430771
NH	-.2251004	.0043392	-51.88	0.000	-.2336051	-.2165956
NJ	-.2919082	.0031439	-92.85	0.000	-.2980701	-.2857463
NM	-.3674819	.0037728	-97.40	0.000	-.3748764	-.3600874
NV	-.3435477	.0035676	-96.30	0.000	-.35054	-.3365553
NY	-.2898876	.0030246	-95.84	0.000	-.2958157	-.2839596
OH	-.2140951	.0030755	-69.61	0.000	-.220123	-.2080673
OK	-.2736139	.0034068	-80.31	0.000	-.2802911	-.2669367
OR	-.260748	.0034356	-75.90	0.000	-.2674817	-.2540143
PA	-.3684048	.0030417	-121.12	0.000	-.3743663	-.3624432
RI	-.2103885	.0044906	-46.85	0.000	-.2191899	-.2015872
SC	-.3496949	.0033392	-104.72	0.000	-.3562397	-.3431502
SD	-.2675057	.0049082	-54.50	0.000	-.2771257	-.2578857
TN	-.4072019	.0032121	-126.77	0.000	-.4134975	-.4009063
TX	-.233834	.0029792	-78.49	0.000	-.2396731	-.2279949
UT	-.3038409	.0033732	-90.08	0.000	-.3104521	-.2972296
VA	-.2087501	.0031659	-65.94	0.000	-.2149552	-.202545
VT	-.208605	.0055575	-37.54	0.000	-.2194976	-.1977124
WA	-.4602977	.0032077	-143.50	0.000	-.4665846	-.4540107
WI	-.2161511	.0032654	-66.19	0.000	-.2225511	-.2097511
WV	-.2155737	.0039369	-54.76	0.000	-.2232898	-.2078576
WY	-.2162598	.0055855	-38.72	0.000	-.2272072	-.2053124
meduc_ru_hs	.0928973	.0005748	161.61	0.000	.0917706	.0940239
meduc_ru_m~s	.1538754	.0005848	263.14	0.000	.1527293	.1550215
smoked	-.0346571	.0006996	-49.54	0.000	-.0360282	-.033286
meduc_ru_u~n	-.0750901	.001777	-42.26	0.000	-.0785729	-.0716073
smoked_unk~n	-.1925879	.0028713	-67.07	0.000	-.1982155	-.1869602
_cons	.928371	.0029842	311.09	0.000	.9225221	.93422

reg precare_1trimestr bd_sept_to_dec mblack married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths smoked meduc_ru_unknown smoked_unknown if mwhite==1 | mblack==1

Table 4.1b Prenatal care started in the 1st trimester (Blacks)

```
. reg  precare_1trimestr mblack bd_sept_to_dec married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_
> 45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH
>  OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths smoked meduc_ru_unknown smoked_unknown if mbla
> ck==1
```

Source	SS	df	MS
Model	10839.576	65	166.762708
Residual	118177.389	616008	.191843919
Total	129016.965	616073	.209418308

Number of obs	=	616074
F(65,616008)	=	869.26
Prob > F	=	0.0000
R-squared	=	0.0840
Adj R-squared	=	0.0839
Root MSE	=	.438

precare_1t~r	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	(dropped)					
bd_sept_to~c	.0094052	.0011713	8.03	0.000	.0071095	.0117008
married	.0752653	.001378	54.62	0.000	.0725645	.0779662
age_11_16	-.1456425	.0035252	-41.31	0.000	-.1525519	-.1387332
age_17_18	-.0550548	.0025032	-21.99	0.000	-.0599609	-.0501487
age_19_21	-.0402704	.0018199	-22.13	0.000	-.0438373	-.0367035
age_22_25	-.0154145	.0016603	-9.28	0.000	-.0186686	-.0121603
age_31_35	-.0036583	.0018961	-1.93	0.054	-.0073746	.000058
age_36_40	-.0129453	.0024817	-5.22	0.000	-.0178094	-.0080811
age_41_45	-.0503809	.0050925	-9.89	0.000	-.060362	-.0403997
age_46_older	-.0657231	.0243686	-2.70	0.007	-.1134848	-.0179615
AK	-.2235084	.0233674	-9.56	0.000	-.2693076	-.1777091
AL	-.1925775	.0086356	-22.30	0.000	-.209503	-.175652
AR	-.2184457	.0094674	-23.07	0.000	-.2370015	-.19989
AZ	-.213394	.0108934	-19.59	0.000	-.2347447	-.1920432
CO	-.2792482	.0113748	-24.55	0.000	-.3015424	-.2569539
CT	-.2146409	.0100078	-21.45	0.000	-.2342559	-.1950258
DC	-.3179029	.0100206	-31.72	0.000	-.3375431	-.2982628
DE	-.1433528	.0113903	-12.59	0.000	-.1656775	-.1210282
FL	-.3518243	.0082346	-42.73	0.000	-.3679638	-.3356849
GA	-.1912041	.0082541	-23.16	0.000	-.2073819	-.1750263
HI	-.1667616	.0199774	-8.35	0.000	-.2059167	-.1276065
IA	-.1762926	.0139077	-12.68	0.000	-.2035512	-.1490341
ID	-.3169356	.0425259	-7.45	0.000	-.4002849	-.2335863
IL	-.2435676	.0083491	-29.17	0.000	-.2599315	-.2272036
IN	-.2688446	.0091428	-29.41	0.000	-.2867642	-.2509251
KS	-.1810058	.0114603	-15.79	0.000	-.2034677	-.158544
KY	-.2865763	.0101448	-28.25	0.000	-.3064598	-.2666927
LA	-.1767081	.0084281	-20.97	0.000	-.193227	-.1601892
MA	-.196138	.0092711	-21.16	0.000	-.2143091	-.177967
MD	-.2679311	.008453	-31.70	0.000	-.2844986	-.2513636
ME	-.1794799	.030274	-5.93	0.000	-.238816	-.1201439
MI	-.2559736	.0083865	-30.52	0.000	-.2724107	-.2395364
MN	-.2989172	.0094213	-31.73	0.000	-.3173827	-.2804517
MO	-.1641335	.0089655	-18.31	0.000	-.1817056	-.1465614
MS	-.1898658	.0086142	-22.04	0.000	-.2067494	-.1729821
MT	-.1013023	.0606943	-1.67	0.095	-.2202611	.0176566
NC	-.2062308	.0084108	-24.52	0.000	-.2227158	-.1897459
ND	-.1896651	.0454179	-4.18	0.000	-.2786828	-.1006475
NE	-.2274574	.0136329	-16.68	0.000	-.2541775	-.2007374
NH	-.27026	.0285139	-9.48	0.000	-.3261463	-.2143738
NJ	-.3393583	.0085653	-39.62	0.000	-.356146	-.3225705
NM	-.3461854	.0210802	-16.42	0.000	-.3875018	-.3048689
NV	-.325292	.0112695	-28.86	0.000	-.3473798	-.3032041
NY	-.2850762	.0082372	-34.61	0.000	-.3012209	-.2689315
OH	-.2279127	.0084457	-26.99	0.000	-.244466	-.2113595
OK	-.2551048	.0101453	-25.15	0.000	-.2749893	-.2352203
OR	-.2229853	.0156096	-14.29	0.000	-.2535795	-.1923911
PA	-.4593493	.0081782	-56.17	0.000	-.4753783	-.4433203
RI	-.2316703	.0147576	-15.70	0.000	-.2605947	-.2027459
SC	-.365949	.0085849	-42.63	0.000	-.3827752	-.3491229
SD	-.304671	.0370047	-8.23	0.000	-.3771991	-.232143
TN	-.5150146	.0086282	-59.69	0.000	-.5319256	-.4981037
TX	-.1979576	.0082684	-23.94	0.000	-.2141633	-.1817519
UT	-.3803207	.0224316	-16.95	0.000	-.4242858	-.3363556
VA	-.1861868	.0085081	-21.88	0.000	-.2028624	-.1695113
VT	-.2939552	.057583	-5.10	0.000	-.4068162	-.1810943
WA	-.4856633	.0103747	-46.81	0.000	-.5059974	-.4653292
WI	-.1576621	.0096397	-16.36	0.000	-.1765557	-.1387686
WV	-.2321348	.0186938	-12.42	0.000	-.268774	-.1954956
WY	-.1576646	.0596	-2.65	0.008	-.2744786	-.0408506
meduc_ru_hs	.0613334	.0015685	39.10	0.000	.0582593	.0644076
meduc_ru_m~s	.1301577	.0016903	77.00	0.000	.1268448	.1334705
smoked	-.0841665	.0021854	-38.51	0.000	-.0884499	-.0798831
meduc_ru_u~n	-.1340713	.0045311	-29.59	0.000	-.1429522	-.1251905
smoked_unk~n	-.1635592	.0076501	-21.38	0.000	-.1785531	-.1485653
_cons	.8947533	.0082268	108.76	0.000	.878629	.9108777

reg precare_1trimestr mblack bd_sept_to_dec married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths smoked meduc_ru_unknown smoked_unknown if mblack==1

Table 4.1c Prenatal care started in the 1st trimester (Whites)

```
. reg  precare_1trimestr mblack bd_sept_to_dec married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_
> 45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH
>  OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY  meduc_ru_hs  meduc_ru_mths smoked meduc_ru_unknown smoked_unknown if mwhi
> te==1
```

Source	SS	df	MS
Model	40968.9834	65	630.292053
Residual	440088.669	3222863	.136552087
Total	481057.653	3222928	.149261061

Number of obs	3222929
F(65,3222863)	4615.76
Prob > F	0.0000
R-squared	0.0852
Adj R-squared	0.0851
Root MSE	.36953

precare_1t~r	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mblack	(dropped)					
bd_sept_to~c	.0002059	.0004365	0.47	0.637	-.0006496	.0010613
married	.0838547	.0005227	160.44	0.000	.0828303	.0848791
age_11_16	-.0714841	.0018868	-37.89	0.000	-.0751822	-.0677861
age_17_18	-.0353937	.0011439	-30.94	0.000	-.0376358	-.0331516
age_19_21	-.0410578	.0007468	-54.98	0.000	-.0425214	-.0395942
age_22_25	-.0223242	.0006128	-36.43	0.000	-.0235252	-.0211231
age_31_35	.0065093	.0005905	11.02	0.000	.0053519	.0076667
age_36_40	-.004031	.0007829	-5.15	0.000	-.0055655	-.0024966
age_41_45	-.0330975	.0016734	-19.78	0.000	-.0363773	-.0298177
age_46_older	-.0603119	.0073703	-8.18	0.000	-.0747574	-.0458663
AK	-.2782565	.0055119	-50.48	0.000	-.2890596	-.2674535
AL	-.2093625	.003622	-57.80	0.000	-.2164615	-.2022636
AR	-.2350255	.0037704	-62.33	0.000	-.2424153	-.2276357
AZ	-.2777305	.0033422	-83.10	0.000	-.284281	-.2711799
CO	-.2804549	.0034505	-81.28	0.000	-.2872178	-.273692
CT	-.2174411	.0037044	-58.70	0.000	-.2247016	-.2101805
DC	-.2619568	.0083167	-31.50	0.000	-.2782572	-.2456563
DE	-.211793	.005184	-40.86	0.000	-.2219535	-.2016326
FL	-.3232932	.0032599	-99.17	0.000	-.3296825	-.316904
GA	-.2176823	.0033515	-64.95	0.000	-.2242512	-.2111135
HI	-.265199	.0060094	-44.13	0.000	-.2769772	-.2534208
IA	-.1977956	.0036835	-53.70	0.000	-.205015	-.1905761
ID	-.3700605	.0039919	-92.70	0.000	-.3778844	-.3622366
IL	-.2451357	.0032715	-74.93	0.000	-.2515478	-.2387237
IN	-.2517215	.0033951	-74.14	0.000	-.2583757	-.2450672
KS	-.2118454	.0036915	-57.39	0.000	-.2190806	-.2046102
KY	-.3198624	.003535	-90.48	0.000	-.3267908	-.3129339
LA	-.1653181	.0036601	-45.17	0.000	-.1724918	-.1581444
MA	-.2096183	.0034455	-60.84	0.000	-.2163714	-.2028652
MD	-.2360713	.003586	-65.83	0.000	-.2430996	-.2290429
ME	-.1976515	.0044665	-44.25	0.000	-.2064056	-.1888974
MI	-.2157513	.0032513	-66.36	0.000	-.2221238	-.2093789
MN	-.2359184	.003428	-68.82	0.000	-.2426372	-.2291995
MO	-.194642	.0034389	-56.60	0.000	-.2013821	-.1879018
MS	-.2057319	.0039406	-52.21	0.000	-.2134555	-.1980084
MT	-.2274357	.0048559	-46.84	0.000	-.2369531	-.2179183
NC	-.215433	.0033614	-64.09	0.000	-.2220213	-.2088447
ND	-.2298625	.0054011	-42.56	0.000	-.2404485	-.2192765
NE	-.2519583	.0039389	-63.97	0.000	-.2596784	-.2442382
NH	-.224644	.0044281	-50.73	0.000	-.233323	-.2159651
NJ	-.2811076	.0033701	-83.41	0.000	-.2877129	-.2745024
NM	-.367772	.0038981	-94.35	0.000	-.3754122	-.3601318
NV	-.3453822	.0037515	-92.06	0.000	-.3527351	-.3380294
NY	-.2927057	.0032441	-90.23	0.000	-.2990641	-.2863473
OH	-.2121214	.0032926	-64.42	0.000	-.2185748	-.205668
OK	-.2761225	.0036068	-76.56	0.000	-.2831918	-.2690533
OR	-.2616017	.0035929	-72.81	0.000	-.2686436	-.2545597
PA	-.3513702	.0032709	-107.42	0.000	-.3577809	-.3449594
RI	-.2085521	.0046811	-44.55	0.000	-.2177269	-.1993773
SC	-.3447534	.0036829	-93.61	0.000	-.3519717	-.3375351
SD	-.2671304	.0049604	-53.85	0.000	-.2768526	-.2574081
TN	-.3786935	.0034573	-109.53	0.000	-.3854698	-.3719173
TX	-.2384998	.0031862	-74.85	0.000	-.2447446	-.2322551
UT	-.3028241	.0035294	-85.80	0.000	-.3097416	-.2959066
VA	-.2169266	.0034078	-63.66	0.000	-.2236057	-.2102475
VT	-.208341	.0055594	-37.48	0.000	-.2192372	-.1974448
WA	-.4588093	.0033935	-135.20	0.000	-.4654604	-.4521581
WI	-.223051	.0034653	-64.37	0.000	-.229843	-.2162591
WV	-.2157721	.0040656	-53.07	0.000	-.2237404	-.2078037
WY	-.2170718	.0055866	-38.86	0.000	-.2280213	-.2061223
meduc_ru_hs	.0968942	.0006158	157.35	0.000	.0956873	.0981011
meduc_ru_m~s	.1551732	.00062	250.28	0.000	.153958	.1563884
smoked	-.0282402	.0007312	-38.62	0.000	-.0296732	-.0268071
meduc_ru_u~n	-.0614674	.0019286	-31.87	0.000	-.0652474	-.0576874
smoked_unk~n	-.1943333	.0030831	-63.03	0.000	-.2003762	-.1882904
_cons	.924652	.003194	289.50	0.000	.918392	.9309121

reg precare_1trimestr mblack bd_sept_to_dec married age_11_16 age_17_18 age_19_21 age_22_25 age_31_35 age_36_40 age_41_45 age_46_older AK AL AR AZ CO CT DC DE FL GA HI IA ID IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY meduc_ru_hs meduc_ru_mths smoked meduc_ru_unknown smoked_unknown if mwhite==1

Appendix C. Vital Statistics, Number and proportion per 1000, from year 1900 to year 1906

No. 41.—DEATHS: NUMBER AND PROPORTION PER 1,000, CALENDAR YEARS 1900 TO 1906, AND ANNUAL AVERAGE, 1901 TO 1905, IN THE REGISTRATION AREA,[a] BY SEX AND AGE.

[From reports of the Bureau of the Census, Department of Commerce and Labor.]

NUMBER OF DEATHS FROM ALL CAUSES.

Sex and age.	Average, 1901–5.	1900	1901	1902	1903	1904	1905	1906
Sex:								
Male	283,962	285,999	276,020	273,585	281,041	296,252	292,912	358,286
Female	245,668	253,940	242,187	235,055	243,374	255,102	252,621	299,819
Age:								
Under 1 year	100,268	111,687	97,477	98,575	96,857	102,880	105,553	133,105
1 year	22,325	26,722	22,461	22,978	21,956	22,268	21,960	28,860
2 years	10,005	12,129	10,031	10,525	10,079	9,750	9,638	12,188
3 years	6,350	7,812	6,605	6,475	6,429	6,323	5,916	7,450
4 years	4,737	5,787	5,104	4,962	4,619	4,681	4,317	5,375
Under 5 years	143,684	164,137	141,678	143,515	139,940	145,902	147,384	186,978
5 to 9 years	13,679	15,678	13,932	13,790	14,047	13,774	12,851	15,317
10 to 14 years	8,703	9,144	8,416	8,163	8,733	9,368	8,835	10,443
15 to 19 years	14,531	14,498	13,969	13,709	14,541	15,496	14,941	17,928
20 to 24 years	22,246	22,260	21,809	21,390	22,227	23,206	22,600	26,805
25 to 29 years	24,439	24,573	24,239	23,542	24,639	25,336	24,438	28,633
30 to 34 years	24,169	23,727	23,665	23,382	24,053	25,237	24,506	28,502
35 to 39 years	25,332	24,606	24,456	24,146	25,314	26,449	26,296	30,790
40 to 44 years	24,743	23,364	24,317	23,797	24,672	25,787	25,143	29,101
45 to 49 years	24,068	22,521	22,802	22,419	23,686	25,487	25,948	30,703
50 to 54 years	25,706	24,283	24,804	24,340	25,534	27,182	26,671	31,166
55 to 59 years	26,081	25,024	25,308	24,654	26,030	27,359	27,054	31,989
60 to 64 years	29,474	27,633	28,491	27,359	29,042	31,453	31,026	36,109
65 to 69 years	30,382	29,123	29,422	28,427	30,335	31,688	32,037	38,040
70 to 74 years	30,124	29,025	29,161	28,196	29,736	32,183	31,343	37,627
75 to 79 years	26,420	25,447	25,732	24,474	26,298	27,666	27,928	33,501
80 to 84 years	19,446	18,843	19,494	18,147	19,222	20,476	19,889	24,025
85 to 89 years	9,962	9,646	9,669	8,946	9,735	10,621	10,841	13,071
90 to 94 years	3,522	3,367	3,483	3,263	3,447	3,814	3,601	4,179
95 years and over	1,118	1,113	1,108	1,072	1,124	1,127	1,158	1,393
Unknown	1,801	1,927	2,252	1,909	2,060	1,743	1,043	1,805
Aggregate	529,630	539,939	518,207	508,640	524,415	551,354	545,533	658,105

PROPORTION PER 1,000 DEATHS.

Sex and age.	Average, 1901–5.	1900	1901	1902	1903	1904	1905	1906
Sex:								
Male	536.2	529.7	532.6	537.9	535.9	537.3	536.9	544.4
Female	463.8	470.3	467.4	462.1	464.1	462.7	463.1	455.6
Age:								
Under 1 year	189.3	206.8	188.1	193.8	184.7	186.6	193.5	202.3
1 year	42.2	49.5	43.3	45.2	41.9	40.4	40.3	43.9
2 years	18.9	22.5	19.4	20.7	19.2	17.7	17.7	18.5
3 years	12.0	14.5	12.7	12.7	12.3	11.5	10.8	11.3
4 years	8.9	10.7	9.8	9.8	8.8	8.5	7.9	8.2
Under 5 years	271.3	304.0	273.4	282.2	266.8	264.6	270.2	284.1
5 to 9 years	25.8	29.0	26.9	27.1	26.8	25.0	23.5	23.3
10 to 14 years	16.4	16.9	16.2	16.0	16.7	17.0	16.2	15.9
15 to 19 years	27.4	26.9	27.0	27.0	27.7	28.1	27.4	27.2
20 to 24 years	42.0	41.2	42.1	42.1	42.4	42.1	41.4	40.7
25 to 29 years	46.1	45.5	46.8	46.3	47.0	46.0	44.8	43.5
30 to 34 years	45.6	43.9	45.7	46.0	45.9	45.8	44.9	43.3
35 to 39 years	47.8	45.6	47.2	47.5	48.3	48.0	48.2	46.8
40 to 44 years	46.7	43.3	46.9	46.8	47.0	46.8	46.1	44.2
45 to 49 years	45.4	41.7	44.0	44.1	45.2	46.2	47.6	46.7
50 to 54 years	48.5	45.0	47.9	47.9	48.7	49.3	48.9	47.4
55 to 59 years	49.2	46.3	48.8	48.5	49.6	49.6	49.6	48.6
60 to 64 years	55.7	51.2	55.0	53.8	55.4	57.0	56.9	54.9
65 to 69 years	57.4	53.9	56.8	55.9	57.8	57.5	58.7	57.8
70 to 74 years	56.9	53.8	56.3	55.4	56.7	58.4	57.5	57.2
75 to 79 years	49.9	47.1	49.7	48.1	50.1	50.2	51.2	50.9
80 to 84 years	36.7	34.9	37.6	35.7	36.7	37.1	36.5	36.5
85 to 89 years	18.8	17.9	18.7	17.6	18.6	19.3	19.9	19.9
90 to 94 years	6.6	6.2	6.7	6.4	6.6	6.9	6.6	6.4
95 years and over	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1
Unknown	3.4	3.6	4.3	3.8	3.9	3.2	1.9	2.7
Aggregate	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0

[a] See footnote on page 87.