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Impacts of Antepartum Health Status and Health Insurance Coverage on Postpartum Maternal Morbidity

by

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Abstract

This paper examines how a woman's antepartum health and health insurance status affect her likelihood of experiencing postpartum maternal morbidity complications. Using the Medical Expenditure Panel Survey from 2006 to 2014, I find that if a woman does not deem herself "healthy" antepartum, she is more likely to experience poorer health postpartum, and as a result, utilize more medical care. Insured women are more likely to utilize postpartum medical care relative to their uninsured counterparts. However, the type of insurance a woman is not associated with maternal morbidity complications. Specifically, women who are covered by Medicaid have the same postpartum health and healthcare use as those covered by private insurance.

Contents

1 Introduction

In the United States in the late 1980's, public policy efforts to improve pregnancy outcomes focused solely on bettering infant health measures while ignoring maternal health outcomes even though women are also profoundly affected by pregnancy and childbirth. Due to the emphasis on improving newborn health outcomes, the infant mortality rate declined to 5.90 infant deaths per 1,000 live births in 2015; a 63% decrease when compared to 1975 (National Center for Health Statistics 2016). Maternal health outcomes did not and do not receive the same level of attention. The maternal morbidity rate has dramatically increased since the early 1990's and has only recently garnered attention, with media outlets and public health literature reporting specifically on the rise of the severe maternal morbidity rate (Center for Disease Control 2017; Creanga et al. 2014; Ellison and Martin 2017; New York City Department of Health and Mental Hygiene 2016).

Obviously, maternal morbidity complications affect the health of the impacted women negatively. However, the increasing maternal morbidity rate has financial and socioeconomic implications that go beyond those faced by the afflicted women. Medicaid is the largest payer of maternity care in the United States, and covers antenatal, perinatal, and postpartum care (Centers for Medicare and Medicaid Services, 2016). Women who experience maternal morbidity complications require additional medical care, making the healthcare costs for these women is higher than for those who experienced a normal, complication free pregnancy and delivery. With Medicaid covering the most maternity care in the United States, the cost burden associated with maternal morbidity would fall predominately on the public insurer. If the maternal morbidity rate continues to rise, so would the costs associated with maternity care which would diminish Medicaid's cost-effectiveness. In addition to the financial burden maternal morbidity places on the public health care system, maternal morbidity complications have the potential to limit a woman's socioeconomic outcomes. Maternal morbidity conditions can hamper a woman's ability to rejoin the workforce, or restrict the type of work she is able to engage in. Therefore, maternal morbidity complications can reduce a woman's ability to adequately care for herself and her children. As a result, she may need to rely on public assistance programs. Consequently, the burden of maternal morbidity is not

exclusively placed on the women who experiences these complications; it also impacts their families, and society at large due to the effects it can have on public health insurance and public assistance programs.

Clearly, efforts should be taken to reduce the frequency of maternal morbidity complications considering the undesirable societal consequences it produces. Unfortunately, according to the Center for Disease Control, it is not clear as to why the maternal morbidity rate is increasing. The purpose of this paper is to determine how a woman's likelihood of experiencing a maternal morbidity complication is affected by both her state of health before she gives birth and by her health insurance, or lack thereof. Maternal morbidity will be defined as a complication or condition that occurred as a result of pregnancy or childbirth that negatively impacts a woman's life for a prolonged period beyond what would be expected after a normal, complication free pregnancy and delivery. Using the Medical Expenditure Panel Survey (MEPS) from 2006 to 2014, I have constructed measures of postpartum medical usage which will serve as maternal morbidity indicators. These measures are sharply defined and capture a woman's medical usage up until the conclusion of her fourth month postpartum. The greater a woman's postpartum medical care utilization, the more likely it is that she has experienced a maternal morbidity complication. I have found that a woman's health antepartum is indicative of whether or not she will experience a maternal morbidity complication postpartum. If a woman does not deem herself as 'healthy' before she gives birth, she is more likely to experience poorer health postpartum, and as a result, have increased medical care utilization. This may be indicative of a maternal morbidity complication or complications. Women with health insurance are more likely to utilize medical care, relative to their uninsured counterparts, after giving birth. However, the type of health insurance a woman has does not affect her likelihood of experiencing a complication.

2 Literature Review

Due to the persistent attention placed on infant health outcomes, there is a limited body of literature within economics, medicine, and public health focused on postpartum maternal health outcomes. However, since infant and maternal health outcomes are intertwined, there will be a brief survey of the economics infant health literature followed by a more in-depth

review of the maternal health literature in the context of economics, medicine and public health.

2.1 Infant Health: Economics Literature

The effects of prenatal and postnatal care on infant health outcomes has been extensively studied in the context of health economics and medicine. Due to the Medicaid expansions of the 1980's and early 1990's, which increased eligibility for pregnant women, the emphasis in the most recent economics literature has been on the impact of prenatal care on birth weight. Most of the previously done economics research homogenously demonstrated that prenatal care, and by extension the Medicaid expansions, had limited effects, if any, on infant health (Currie and Gruber 1996; Currie and Grogger 2002; Joyce 1999). However, Conway and Deb (2005), demonstrated that prenatal care does have a significant positive effect on normal pregnancies while having a weak effect on complicated ones.

The Medicaid expansions, despite increasing prenatal care access, have not been able to reduce the differences in the low birth weight among different races. Lhila and Long (2012) have found that there is a 6.8 percentage point racial gap in low birth weight among black and white mothers.

Postnatal care, like prenatal care, also positively affects infant outcomes. Evidence from Australia shows that, Infants experience increased postnatal care benefits when there are parental leave extensions; for example, infants of mothers who extended their parental leave had a lower likelihood of having chronic health conditions (Khanam Nghiem Connelly 2015).

2.2 Maternal Health: Economics Literature

While the economics literature on infant health outcomes is large and multifaceted, the economics literature on maternal health outcomes is decidedly less so. There is a lack of work on the effects that pre and postnatal care have on maternal health outcomes, especially maternal morbidity. To my knowledge, there are only four studies that analyzed the effects of prenatal care on maternal health outcomes and behaviors in the United States. Two of the four were influenced, like much of the economics literature on infant health outcomes, by the Medicaid expansions of the 1980's and early 1990's. Kutinova and Conway (2008)

examined the relationship between the Medicaid expansions and maternal health. In their paper, they used the occurrence of three maternal morbidity complications to serve as their measure of maternal health. The complications used were chosen because they were deemed "potentially preventable by prenatal care" (Kutinova and Conway 2008). However, they were unable to conclude that the expansions affected the incidence of these complications. Additionally, prenatal care was found to increase the likelihood that mothers maintained a healthy weight after their pregnancies, and that prenatal care also contributed to reducing the length of maternal in-patient stays post-delivery (Conway and Kutinova 2006).

The latter two studies examined the relationship between prenatal care and postpartum maternal health behaviors. Reichman et al (2010) found "that first trimester prenatal care appears to decrease maternal postpartum smoking by about 5 percentage points and increase the likelihood of 4 or more well-baby visits by about 1 percentage point." Whereas inadequate prenatal care utilization results in a variety of negative maternal health complications and behaviors (Yan 2017).

Using Taiwanese insurance claims data, Liu et al. (2015) also found that the receiving of adequate prenatal care reduces the likelihood of "postpartum maternal hospitalization among women who had a vaginal delivery by 43.8%." They did not find that prenatal care had the same effect for women who had cesarean deliveries.

There are no policies that explicitly govern postnatal care in the United States. Therefore, the literature on the impact of postnatal care on maternal health emphasizes how the choices mothers make effect their health. Mothers have regularly participated in the labor force since the 1980's, but by not returning to work immediately postpartum, mothers may reduce the number or frequency of depressive symptoms that they may experience (Chatterji Markowitz and Brooks-Gunn 2012). Additionally, stress can adversely affect both an individual's physical and mental health. Using a small sample of Australian mothers who took part in a twelve week exercise program, Currie (2004) finds that these women reported greater feelings of wellbeing which she attributes to the fact that they have made time for themselves outside of the home working on themselves.

The lack of economics literature on maternal morbidity in the United States is in part due to the belief that maternal morbidity is an issue isolated in the developing world. Unsurpris-

ingly, the economics literature regarding maternal morbidity is focused on developing world (DaVanzo et al. 2004). However, the challenges and intuition discussed in this literature cannot impart any information that would be applicable regarding the increasing maternal morbidity rate in the United States.

2.3 Maternal Health: Medical and Public Health Literature

The limited information we have on maternal morbidity comes predominantly from medical and public health literature. While not being explicitly interested in maternal morbidity, Haas Udvarhelyi and Epstein (1993) noted that "60% of women [in the United States] receive medical care for some complication of pregnancy, and 30% suffer complications that result in serious morbidity." The authors "focused on adverse maternal health outcomes, [maternal morbidity outcomes]" among previously uninsured low income pregnant women who obtained health insurance through Massachusetts' Healthy Start program from 1984 and 1987, and concluded that health insurance provided through the Healthy Start program did not result in any improvement in maternal health for these women (Hass Udvarhelyi and Epstein 1993). However, the authors investigated a limited range of maternal health outcomes, and did not consider the selection bias that existed within their sample. Using data from 1993 – 1997, Danel et al. (2003), "summarized the prevalence of maternal morbidity during labor and delivery hospitalizations in the United States," and noted that only 57% of women had no maternal morbidity complications during their labor and delivery.

In addition, the occurrence of maternal morbidity, like low infant birth weight, varies by race. Severe maternal morbidity was found to affect minority women at higher rates than non-Hispanic white women. (Creanga et al. 2013). However, evidence from California establishes Mexican-born mothers have lower rates of maternal morbidity than their white US-born counterparts, a surprising result considering that Mexican-born women tend to have lower socioeconomic outcomes compared to their white US-born counterparts; this is evidence of the existence of a foreign-born advantage (Guendelman et al. 2005).

Maternal morbidity complications also vary with age. According to Lopoo (2011), teenaged mothers, of high socioeconomic and health status, are less likely to experience maternal morbidity complications when compared to their less affluent counterparts. The

American College of Obstetricians and Gynecologists (ACOG) also notes that the likelihood of complications increases when the mother to be is over the age of thirty-five.

The medical and public health literature regarding maternal morbidity in the developing world is expansive, but since it is outside the scope of this paper, it will not be discussed in any detail. See Fortney and Smith (1996), Hu et al. (2007), Koblinsky et al. (2012), and Lori and Starke (2012) for more information about maternal morbidity in Bangladesh, Egypt, India, Indonesia, Liberia, and Mexico.

3 Data

The data used comes from the Household Component of the Medical Expenditure Panel Survey (MEPS). Conducted annually since 1996, by the Agency for Healthcare Research and Quality (AHRQ), MEPS is a national series of surveys that collects data on healthcare use and its financing in the United States. The Household Component collects data from a nationally representative subsample of families and individuals that were in the previous year's National Health Interview Survey. By conducting household interviews, MEPS collects detailed data on the demographic, socioeconomic, health, and medical characteristics for each individual in a selected household. The Medical Expenditure Panel Survey, as its name suggests, is a panel survey with each panel spanning two complete calendar years. The selected individuals undergo five rounds of interviews during the data collection process. Assuming an individual completes the entirety of the interview rounds, there are data on that individual for the entire panel. Therefore, it is possible to track the changes in an individual's health status and healthcare utilization over the two panel years.

To construct the MEPS sample used in this study both consolidated full year files and event files from the Household Component were used. The sample used covers period of eight years, from 2006 to 2014. Only data from complete panels were included in the sample. The consolidated full year files are structured so that there is one observation per respondent. The event files record medical care utilization throughout a year and as a result there may be no, one, or many observations for a given respondent depending on the number of times they experienced a given event. For example, a respondent who had three emergency room visits in 2013 would have three separate observations in the Emergency Room Visits event

file for that year. Using the hospital inpatient stay event files, women who gave birth in a hospital were identified, and of those women only those for whom four months of antepartum healthcare usage and four months of postpartum health usage were recorded in MEPS were included in the sample. A woman's recorded date of delivery was used to determine what her specific ante and postpartum cutoff dates were. For example, a woman who gave birth in March during the first year of a panel would not be included in the sample because only two months of antepartum healthcare usage, January and February, would have been documented for her in MEPS. Similarly, a woman who gave birth in December during the second year of a panel would not be included in the sample because her postpartum healthcare use would not have been documented in MEPS. For a visual representation of the sample birth cutoffs please refer to the attached figure. Having identified the women of interest, I merged the sample hospital inpatient stays event file with emergency room visits and office-based medical provider visits event files in order to obtain four months of ante and four months of postpartum emergency room and doctor visits utilization for all the women in the sample. The full year consolidated data file was also merged to include the women's demographic and socioeconomic variables in the dataset.

The full year consolidated data file was also used to construct ante and postpartum self-reported health status variables, as the full year consolidated data file records an individual's self-reported health status for each round of the panel. However, the start and end dates for each panel round is not the same for everyone in a panel. As a result, the antepartum self-reported health status variable records a woman's self-reported health status in the round before she gives birth, and the postpartum self-reported health status variable refers to a woman's health status in the round after she gives birth. The ante and postpartum self-reported health variables are not as clearly demarcated as the sample birth cutoffs that were used to restrict the sample.

The ante and postpartum self-reported health status variables are categorical variables that are comprised of four health status categories. A woman can be in excellent (coded as a 1), very good (coded as a 2), good (coded as a 3), and fair or poor (coded as a 4) health. The MEPS self-reported health status variable explicitly includes a poor self-reported health status category. However, due to the small number of women who perceived their health

status as poor, the poor health status category has been absorbed by the fair or poor category in both the ante and postpartum self-reported health status variables.

With regards to the medical usage variables, the ante and postpartum hospital inpatient use variables are defined as binary indicators because very few women had more than one ante or postpartum hospital stay. Similarly, the ante and postpartum emergency use variables are also defined as binary indicators. The reasoning is the same; it is rare for a woman to have more than one emergency room visit ante or postpartum. The ante and postpartum office based medical visits variables are integer-valued, denoting the number of doctor visits a woman had before and after she gave birth.

The final sample included 2,312 observations. Forty-six percent of women in the sample are covered by private insurance with thirty-two percent being covered by Medicaid. Twelve percent of the women in the sample are uninsured, and a small minority of about one percent are covered by a form of public insurance that is not Medicaid. Women with long inpatient delivery stays, delivery stays that lasted longer than four days, make up twenty percent of the sample. Of the women who deemed themselves to be in excellent health antepartum fifty-three percent of them had private insurance. Fifty-six percent of the women who deemed themselves to be in excellent health postpartum had private insurance. Additional summary statistics can be found in tables 1 and 2.

4 Empirical Methods

As was previously mentioned, postpartum maternal morbidity can present itself as a variety of conditions and complications. Therefore, I use three measures of postpartum medical care utilization and postpartum self-reported health status to serve as my maternal morbidity indicators because these factors are likely to be impacted if a woman experiences a morbidity complication or condition. The three measures of medical care utilization being used are postpartum emergency room visits, postpartum inpatient hospital stays, and postpartum office based medical visits.

To determine if a woman's state of health antepartum and her health insurance affect her likelihood of experiencing maternal morbidity complications, I use three econometric

specifications. In the first specification denoted by

$$E(y) = f\{[\beta_1][Ins]\}, \tag{1}$$

where Y represents the postpartum maternal morbidity indicators and Ins represents a vector of different types of insurance (Medicaid, private insurance, and other public insurance), I learn about the unadjusted associations of health insurance status on postpartum health and medical care use.

The second specification, postpartum maternal morbidity indicators are a function of the vector of antepartum health status and medical care use (Y_0):

$$E(y) = f\{[\beta_2][Y_0]\}. \tag{2}$$

The final specification includes insurance status, antepartum health and medical care and a vector of demographic and socioeconomic characteristics as covariates. This specification is denoted by

$$E(y) = f\{[\beta_1[Ins] + [\beta_2][Y_0] + [\beta_3][X_0]\}. \tag{3}$$

By focusing on health status and medical care use in a narrow window of time prior to and after childbirth, I decrease the possibility that changes from antepartum to postpartum measurements of health and medical care are of a generic nature. Nevertheless, if they are viewed as measurements of health and medical care at two points in time, then the model in equation 3 can be framed as a first-differenced panel data regression. In that framing, the effects of health insurance can be given a more causal interpretation because individual-level unobserved heterogeneity associated with health and health insurance would be differenced away.

As described above, postpartum hospital inpatient use and emergency room use are defined as binary indicators, so I specify the models for equations 1 - 3 as logistic regressions. Office-based medical care visits is an integer-valued variable so I estimate a Poisson regression. Self-reported health status is defined as an ordered multinomial variable so an ordered logit model is estimated. In each case, inference is based on robust standard errors. I estimate average marginal effects to interpret the findings.

5 Results

Table 3 reports the average marginal effects derived from three separate logit regressions that determines the likelihood that a woman has a postpartum emergency room visit. The first column reports the marginal effects of health insurance type on whether or not a woman has a postpartum emergency room visit. These marginal effects are estimated from logit regression, that of health insurance type on postpartum emergency room visits, refer to equation 1 for the applicable econometric specification. Similarly, the second results column details the marginal effects from an another logit regression, that of antepartum health status and medical use on whether or not a woman had a postpartum emergency room visit, equation 2 refers to this logit's specification. The third column of average marginal effects is the result of a logit that controls for health insurance type and antepartum health status and medical use in addition to demographic and socioeconomic control covariates, refer to equation 3 for the specification. According to the marginal effects from the logistic regression of health insurance type on the likelihood that a woman experiences a postpartum emergency room visit, a woman is 7.00 percentage points more likely to have a postpartum emergency room visit if she has Medicaid compared to an uninsured woman. However, this effect is not significant when antepartum health characteristics, demographic, and socioeconomic factors are controlled for. In the simplified estimation of antepartum health status and medical usage on the occurrence of an emergency room visit, having an inpatient delivery stay of greater than four days makes a woman 1.90 percentage points more likely to need emergency care, when controlling for the additional factors a woman is 2.00 percentage points more likely to need emergency care if she has a long inpatient delivery stay, both of these estimates are significant at the 10% level. However, while having fair or poor health before giving birth does not affect the occurrence of having an emergency room visit postpartum according to the marginal effects from the antepartum health status and medical use logit, in the more complete estimation having fair antepartum health makes a woman 3.60 percentage points more likely to have an emergency room visit.

Table 4 reports the average marginal effects derived from three separate logit regressions that determine the likelihood that a woman has a postpartum inpatient hospital stay, with

the first column of marginal effects resulting from a logit that refers to the econometric specification denoted by equation 1. The second and third columns of marginal effects are the results of two additional logits that refer to equations 2 and 3, respectively. The first column of marginal effects resulted from the logit regression of health insurance type on whether or not a woman has a postpartum hospital stay. Similarly, the second results column details the marginal effects from the regression of antepartum health status and medical usage on the likelihood of a woman having a postpartum hospitalization. The third column of average marginal effects is the result of the more complete estimation that controls for health insurance type, antepartum health status and medical usage, and other control covariates. Due to the rarity of hospitalization, the marginal effects from the first and second regressions are not significant. However, a woman is 2.20 percentage points more likely to have a postpartum hospitalization at the ten percent level if she was in fair or poor health antepartum, according to the marginal effects from the more complete estimation.

Table 5 reports the average marginal effects derived from three Poisson regressions that determine the effects that health insurance type, and antepartum health characteristics have on the number of postpartum office based medical visits a woman has. The first column's marginal effects result from a Poisson regression and is specified by equation 1. The second and third columns of marginal effects are also the result of two Poisson regressions; the econometric specifications of each of these regressions are outlined by equations 2 and 3. The first column of marginal effects resulted from the regression of health insurance on how many postpartum office based visits a woman will have. The second results column displays the marginal effects from the regression of antepartum health status and medical usage on postpartum office based visits. The third column of average marginal effects is the result of a more complete estimation that controls for health insurance type, antepartum health status and medical usage, and other control variables. In the estimation that controls exclusively for health insurance type, women covered by Medicaid had 31.3% more visits when compared to their uninsured counterparts and women who had private insurance had on average 70.1% more visits when compared to their uninsured counterparts. When antepartum health status and medical usage and other controls are accounted for those insured by Medicaid had 29.5% more office based medical visits compared to uninsured women and those with private

insurance had 25.9% more visits, respectively. Similarly, in the estimation that focuses on the effects of antepartum health status and medical usage on postpartum office based visits, women who had an antepartum emergency room visit had 27.5% more office based visits and every additional antepartum office based medical visit a woman had increased the number of postpartum medical visits she would have by 10.0%. According to the more complete estimation's average marginal effects, women who had an emergency room visit antepartum had 36.3% more office based medical visits, relative to uninsured women. Each antepartum office based medical visit increased a woman's postpartum office based medical visits by 8.90%. The impact of having fair or fair antepartum health on office based medical visit occurrence is only significantly different from zero when controls are added to the regression; if you are in fair or poor health antepartum you have 42.0% more visits relative to a woman who was in excellent health.

The three separate ordered logit regressions were also estimated. As with the previous logit and Poisson regressions there was one estimation of insurance type on postpartum self-reported health status, one estimation of antepartum health status and medical usage on postpartum self-reported health status, and a more complete estimation that controls for health insurance type and antepartum health characteristics in addition to demographic and socioeconomic control covariates. The average marginal effects from these regressions indicate the following: the poorer the health of a woman antepartum the more likely she is to be in worse health postpartum, and the more she utilizes office based and emergency medical care. See table 6 for the average marginal effects from the three ordered logit regressions. Please note that while the average marginal effects of having excellent health postpartum health were estimated these estimates are not shown in the table.

6 Conclusion

The maternal morbidity rate in the United States has been rapidly increasing since the early 1990's. However, there has been limited research done on maternal morbidity and the factors that contribute to its increase in this context. Adding to the literature in this area, this paper has shown that antepartum health status and medical usage can be used as indicators to determine a woman's likelihood of experiencing a maternal morbidity

complication. The healthier a woman is antepartum the less likely she is to utilize medical care postpartum and therefore, the less likely she is to experience a maternal morbidity complication. The reverse is true for women who not healthy antepartum. Considering that women who are not healthy antepartum are more likely to experience negative postpartum outcomes, it may be worth it for policy makers to consider putting forth initiatives specifically geared towards pregnant women who are in poor health, such initiatives may help reduce the likelihood of maternal morbidity conditions for these women.

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8 Tables

Table 1: Sample Means of Independent Variables

		Insurance Type			
	All	Medicaid	Private	Public	Uninsured
Postpartum Emergency Room Visit	0.03	0.05	0.03	0.03	0.01
Postpartum Inpatient Hospitalization	0.01	0.02	0.01	0.00	0.01
Postpartum Office Based Medical Visits	1.11	0.96	1.37	0.86	0.74
Post Health: Excellent	1.00	0.25	0.56	0.09	0.11
Post Health: Very Good	2.00	0.31	0.50	0.09	0.10
Post Health: Good	3.00	0.35	0.39	0.12	0.14
Post Health: Fair/Poor	4.00	0.45	0.31	0.13	0.11
N	2312	737	1073	229	273

Table 2: Sample Means of Dependent Variables

		Insurance Type			
	All	Medicaid	Private	Public	Uninsured
Long Inpatient Delivery Stay	0.19	0.22	0.18	0.23	0.15
Ante Inpatient Hospital Stay	0.02	0.02	0.03	0.03	0.01
Ante Emergency Room Visit	0.08	0.09	0.07	0.09	0.05
Ante Office Based Medical Visit	4.70	4.29	5.36	4.34	3.56
Ante Health: Excellent	1.00	0.29	0.53	0.07	0.10
Ante Health: Very Good	2.00	0.30	0.51	0.09	0.10
Ante Health: Good	3.00	0.34	0.40	0.12	0.13
Ante Health: Fair/Poor	4.00	0.44	0.30	0.14	0.11
Age: 15 - 20	0.14	0.25	0.07	0.15	0.11
Age: 21 - 30	0.52	0.56	0.47	0.59	0.57
Age: 31 - 40	0.31	0.17	0.43	0.24	0.29
Age: 41 - 44	0.02	0.02	0.02	0.02	0.03
White	0.63	0.53	0.66	0.66	0.78
Black	0.18	0.30	0.12	0.20	0.10
Hispanic	0.33	0.35	0.20	0.51	0.62
Less than High School	0.33	0.48	0.17	0.51	0.46
High School	0.49	0.52	0.48	0.47	0.48
College	0.12	0.02	0.23	0.03	0.06
Advanced Degree	0.07	0.00	0.15	0.00	0.01
Married	0.55	0.28	0.76	0.43	0.58
Poverty Category	2.73	1.73	3.78	1.82	2.06
N	2312	737	1073	229	273

Table 3: Marginal Effects on Postpartum Emergency Room Visit

	(1)	(2)	(3)
Medicaid	0.070*		0.074
	(0.042)		(0.049)
Private Insurance	0.040		0.045
	(0.030)		(0.037)
Public Insurance	0.053		0.055
	(0.051)		(0.059)
Long Delivery Stay		0.019*	0.020*
		(0.011)	(0.012)
Ante Inpatient Stay		-0.009	-0.012
		(0.018)	(0.017)
Ante ER Visit		0.023	0.023
		(0.017)	(0.017)
Ante Office Visits		0.001	0.001
		(0.001)	(0.001)
Ante Health: Very Good		-0.003	-0.003
		(0.009)	(0.009)
Ante Health: Good		0.001	0.004
		(0.010)	(0.010)
Ante Health: Fair/Poor		0.033	0.036*
		(0.021)	(0.021)
Control Covariates	No	No	Yes
N	2312	2219	2219

Estimates from a logistic regression
Standard errors in parentheses
Significance levels denoted by $*p < 0.10$; $**p < 0.05$; $***p < 0.01$
Column 1 refers to the insurance only model, see equation 1
Column 2 refers to the antepartum health characteristics only model, see equation 2
Column 3 refers to the more complete model that controls for insurance, antepartum health characteristics, and the additional control covariates, see equation 3
Control Covariates: Age: 15 - 20, Age: 31 - 40, Age: 41 - 44, Hispanic, Black, High School, College, Advanced Degree, Married, Near Poor, Low Income, Middle Income, High Income, Year Indicators 2007-2014

Table 4: Marginal Effects on Postpartum Inpatient Hospitalization

	(1)	(2)	(3)
Medicaid	0.013		0.001
	(0.015)		(0.010)
Private Insurance	0.010		0.006
	(0.012)		(0.010)
Public Insurance	-0.006		-0.008
	(0.010)		(0.007)
Long Delivery Stay		0.007	0.006
		(0.007)	(0.007)
Ante Inpatient Stay		0.038	0.043
		(0.033)	(0.034)
Ante ER Visit		-0.005	-0.006
		(0.007)	(0.007)
Ante Office Visits		-0.000	-0.000
		(0.001)	(0.001)
Ante Health: Very Good		0.000	0.001
		(0.005)	(0.005)
Ante Health: Good		0.010	0.011
		(0.006)	(0.007)
Ante Health: Fair/Poor		0.021	0.022*
		(0.013)	(0.013)
Control Covariates	No	No	Yes
N	2312	2219	2219

Estimates from a logistic regression
Standard errors in parentheses
Significance levels denoted by $*p < 0.10$; $**p < 0.05$; $***p < 0.01$
Column 1 refers to the insurance only model, see equation 1
Column 2 refers to the antepartum health characteristics model, see equation 2
Column 3 refers to more compete model that controls for insurance, antepartum health characteristics, and the additional control covariates, see equation 3
Control Covariates: Age: 15 - 20, Age: 31 - 40, Age: 41 - 44, Hispanic, Black, High School, College, Advanced Degree, Married, Near Poor, Low Income, Middle Income, High Income, Year Indicators 2007-2014

Table 5: Marginal Effects on Postpartum Office Based Medical Visits

	(1)	(2)	(3)
Medicaid	0.313**		0.295**
	(0.144)		(0.141)
Private Insurance	0.701***		0.259**
	(0.122)		(0.116)
Public Insurance	0.185		0.066
	(0.166)		(0.152)
Long Delivery Stay		0.056	0.085
		(0.096)	(0.095)
Ante Inpatient Stay		0.205	0.172
		(0.215)	(0.198)
Ante ER Visit		0.275**	0.363**
		(0.137)	(0.143)
Ante Office Visits		0.100***	0.089***
		(0.008)	(0.008)
Ante Health: Very Good		0.018	0.025
		(0.074)	(0.070)
Ante Health: Good		0.023	0.133
		(0.088)	(0.090)
Ante Health: Fair/Poor		0.243	0.420**
		(0.160)	(0.172)
Control Covariates	No	No	Yes
N	2312	2219	2219

Estimates from a Poisson regression
Standard errors in parentheses
Significance levels denoted by $*p < 0.10$; $**p < 0.05$; $***p < 0.01$
Column 1 refers to the insurance only model, see equation 1
Column 2 refers to the antepartum health characteristics only model, see equation 2
Column 3 refers to the more complete model that controls for insurance, antepartum health characteristics, and the additional control covariates, see equation 3
Control Covariates: Age: 15 - 20, Age: 31 - 40, Age: 41 - 44, Hispanic, Black, High School, College, Advanced Degree, Married, Near Poor, Low Income, Middle Income, High Income, Year Indicators 2007-2014

Table 6: Marginal Effects on Postpartum Self-Reported Health Status

	(1)			(2)			(3)		
	V Good	Good	Fair/Poor	V Good	Good	Fair/Poor	V Good	Good	Fair/Poor
Medicaid	-0.003	0.022	0.011				-0.002	0.023	0.014
	(0.003)	(0.021)	(0.011)				(0.002)	(0.017)	(0.010)
Private Insurance	0.007**	-0.073***	-0.034***				0.001	-0.019	-0.011
	(0.003)	(0.021)	(0.010)				(0.001)	(0.018)	(0.010)
Public Insurance	-0.003	0.019	0.010				0.000	-0.005	-0.003
	(0.006)	(0.027)	(0.015)				(0.001)	(0.021)	(0.012)
Long Delivery Stay				0.000	-0.001	-0.001	0.000	-0.004	-0.002
				(0.001)	(0.013)	(0.007)	(0.001)	(0.013)	(0.007)
Ante Inpatient Stay				-0.002	-0.037	-0.019	-0.001	-0.026	-0.014
				(0.005)	(0.027)	(0.013)	(0.003)	(0.028)	(0.014)
Ante ER Visit				-0.001	0.012	0.007	-0.000	0.002	0.001
				(0.003)	(0.021)	(0.013)	(0.001)	(0.021)	(0.012)
Ante Office Visits				-0.000	0.003**	0.002**	-0.000	0.004***	0.002***
				(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Ante Health: Very Good				0.081***	0.136***	0.031***	0.070***	0.135***	0.031***
				(0.013)	(0.014)	(0.004)	(0.012)	(0.014)	(0.004)
Ante Health: Good				0.0120	0.296***	0.100***	0.0106	0.278***	0.094***
				(0.015)	(0.017)	(0.010)	(0.014)	(0.018)	(0.009)
Ante Health: Fair/Poor				-0.175***	0.356***	0.328***	-0.165***	0.354***	0.297***
				(0.025)	(0.021)	(0.039)	(0.026)	(0.019)	(0.037)
Control Covariates	No	No	No	No	No	No	Yes	Yes	Yes
N	2022	2022	2022	2007	2007	2007	2007	2007	2007

Estimates from an ordered logit regression

Standard errors in parentheses

Significance levels denoted by $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

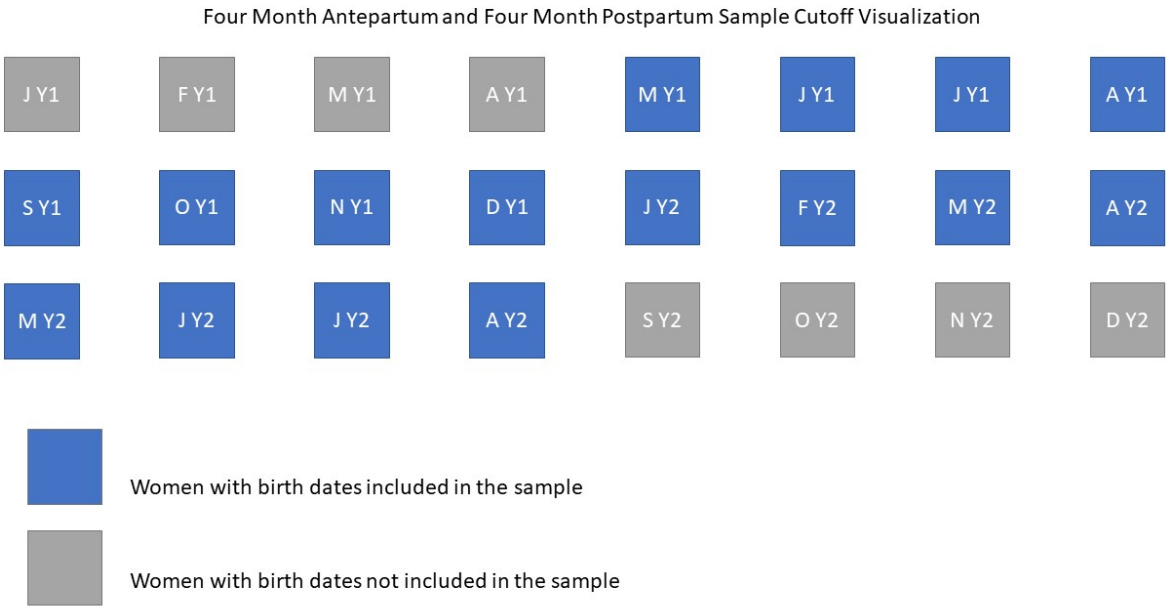
Column 1 refers to the insurance only model, see equation 1

Column 2 refers to the antepartum health characteristics only model, see equation 2

Column 3 refers to the more rigorous model that controls for insurance, antepartum health characteristics, and the additional control covariates, see equation 3

Control Covariates: Age: 15 - 20, Age: 31 - 40, Age: 41 - 44, Hispanic, Black, High School, College, Advanced Degree, Married, Near Poor, Low Income, Middle Income, High Income, Year Indicators 2007-2014

9 Figures


Four Month Antepartum and Four Month Postpartum Sample Cutoff Visualization
J Y1
F Y1
M Y1
A Y1
M Y1
J Y1
J Y1
A Y1
S Y1
O Y1
N Y1
D Y1
J Y2
F Y2
M Y2
A Y2
M Y2
J Y2
J Y2
A Y2
S Y2
O Y2
N Y2
D Y2
Women with birth dates included in the sample
Women with birth dates not included in the sample