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Examining the Role of Insurance Coverage in Maternal Health Disparities

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Examining the Role of Insurance Coverage in Maternal Health Disparities

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Abstract

The Great Recession had a profound impact on healthcare access, particularly for marginalized communities. This period of economic downturn highlighted the urgent need for healthcare reform. Although the Affordable Care Act (ACA) was not a direct response to the recession, the financial uncertainty it created led to a surge in Medicaid enrollment, contributing to the official passage of the ACA in 2010. Medicaid expansion improved healthcare access for low-income individuals, particularly pregnant women, by increasing coverage and access to essential maternal health services. However, disparities in maternal morbidity and mortality persist, with Black women facing significantly higher risks of pregnancy-related complications than white women. While previous research has explored the ACA's impact on healthcare access, limited attention has been given to how insurance type (public vs. private) affects maternal morbidity and birth outcomes, particularly after the 2014 Medicaid expansion. This study examines the relationship between insurance coverage and maternal health outcomes, highlighting existing disparities and assessing whether public insurance expansion has mitigated adverse maternal health effects. By addressing these gaps, this research contributes to policy discussions aimed at improving maternal healthcare quality and reducing inequities in health outcomes.

Keywords: insurance, ACA, healthcare, pregnancy

Examining the Role of Insurance Coverage in Maternal Health Disparities

Extensive research has been conducted on the socioeconomic factors influencing maternal morbidity, as well as the impact of insurance coverage on maternal health outcomes. However, a significant gap exists in understanding the intersection of these two areas—specifically, how differences in insurance type (public vs. private) influence maternal morbidity across various socioeconomic and racial demographics.

It is well established that racial disparities persist in maternal health outcomes and that income levels play a crucial role in determining birth outcomes. For instance, "Black women are disproportionately affected and are three times more likely to experience a pregnancy-related death compared to Non-Hispanic White women" (Montalmant & Ettinger, 2023). Fewer studies exist addressing how maternal morbidity rates have changed pre- and post-expansion of public insurance while accounting for the differences in public and private healthcare coverage. This gap is particularly important given that several states, many in the South and Midwest, have opted out of expanding Medicaid under the ACA. For example, Alabama reported "a maternal mortality rate of 64.63 deaths per 100,000 births between 2018 and 2021, nearly double the national average of 34.09 per 100,000 births. That jumps to 100.07 deaths for Black women in the state" (Riddle, 2025). Despite these alarming figures, Alabama is one of ten states that have not expanded Medicaid, leaving many low-income women caught in a coverage gap where they either earn too much to qualify for Medicaid coverage or not enough to afford private insurance. While states like Mississippi and Arkansas have introduced similar efforts to expand maternal health coverage, implementation has stalled due to challenges in funding from the federal government.

To conduct this analysis, it is essential to include studies that evaluate maternal morbidity outcomes while focusing on the U.S population and the role of insurance type. A key data source for this research is the Vital Statistics Online Data Portal, maintained by the National Center for Health Statistics, which provides downloadable datasets covering birth, mortality, and fetal death statistics from 1968 onwards. The dataset used in this study includes variables essential for assessing maternal health trends, particularly in relation to economic factors and insurance coverage. This enables a more comprehensive examination of disparities in maternal morbidity. The literature on the topic of maternal health has primarily focused on the specific disparities between certain racial and socioeconomic demographics. While existing research consistently confirms that racial and socioeconomic disparities in maternal health exist, many studies fall short of identifying a singular, definitive cause for their persistence.

Data Extraction

This study utilizes data from the CDC Natality Files, within the Vital Statistics Data Online Portal, which provides comprehensive birth records for all U.S states. Due to the sensitive nature of the dataset, which includes personal identifiers, access to the restricted-use version was obtained to ensure data accuracy and enable the use of unique identifiers. These identifiers were essential for correctly matching and tracking observations across multiple years, preventing duplication errors during data merging. To perform this descriptive analysis, it was crucial to include variables that would accurately evaluate maternal morbidity outcomes. In addition, studies needed to focus on the U.S population and address the impact of insurance type. The study period from 2009 to 2022 was selected due to the introduction of the Affordable Care Act (ACA) in 2010. Prior to 2009, variables measuring insurance coverage were not

available. By analyzing data from 2009 onward, this study captures the trends in maternal health outcomes, via the chosen and generated variables, allowing for a robust examination of its impact while controlling for relevant variables. Since the ACA was introduced in 2010, pre-expansion would be considered years before 2014, and post-expansion would be considered 2014 onwards. Post-expansion starts in 2014, but varies by state depending on when or even if they adopted expansion. California, for instance, expanded Medicaid in 2014, but Alabama or Mississippi have not expanded Medicaid at all.

Upon acquisition, the datasets—initially provided in a compressed zip format—were extracted and cleaned for analysis. An in-file dictionary was created for each year of study (2009-2022), defining variable types, labels, and formats to facilitate accurate interpretation when imported into STATA. This step was critical for managing the extensive number of variables and again ensuring consistency across all years. Only after this process was completed could the datasets be properly imported into STATA to prepare for amending. Prior to amending, however, a multitude of variables that represent the same categories across all years had to be regenerated and replaced to be standardized throughout all years. Only then could the stratification by race and a federal assistance program called The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) occur.

To enhance the dataset, key socioeconomic and demographic variables were integrated from the Integrated Public Use Microdata Series (IPUMS), including income, insurance type (HCOVPUB1, HCOVPRIV1), race/ethnicity, age, and education. To accurately integrate the CDC Natality Files with the IPUMS extract, a crosswalk was developed within STATA. This crosswalk allows for a structured mapping based upon common identifiers, which ensure the

datasets are merging properly. This step was critical for linking maternal health variables through the Natality files and the socioeconomic and demographic variables through IPUMS. Rigorous data cleaning was conducted to eliminate any missing variables and incomplete records, resulting in a ready dataset for analysis. The sample size approximates around twenty-five million observations after appending all years together.

It is important to note that the COVID-19 pandemic had a major impact on the 2020 American Community Survey (ACS), significantly affecting how data was collected. Standard procedures (mailed surveys, interviews, etc) were delayed or halted, resulting in the lowest response rate in ACS history. Among these were reduced representation of minority and low-income populations. This could cause potential biased estimates related to race, income, education, and health coverage.

Empirical Model

The analysis proceeds in several stages, progressively adding controls, such as policy-related variables, to isolate the effects of insurance types. Variables were created to assess maternal morbidity outcomes across different insurance coverage types. The MORBIDSUM variable was generated as a composite measure, combining multiple maternal morbidity indicators. These characteristics include Maternal Transfusion, Perineal Laceration, Ruptured Uterus, ICU admission, and Unplanned Hysterectomy, and these were found through the Natality files. The initial regression estimates the observed difference in maternal morbidity outcomes between individuals covered by public insurance and private insurance. A MORBIDSUM>0 variable indicates the presence of at least one morbidity condition, but more importantly, it also reflects the likelihood of comorbidities–the development of multiple health complications

simultaneously. Analyzing MORBIDSUM in relation to controlling for the insurance type, revealing possible underlying effects as to how insurance type will either mitigate or promote the risk of developing additional complications.

In addition to examining the effects of insurance type on MORBIDSUM, while holding other variables constant, a regression analysis was conducted to assess its impact on DBWT (birth weight of the baby). DBWT, a variable within the CDC Natality Files, measures an infant's birth weight in grams, serving as a critical indicator of neonatal health. Low birth weight is associated with increased risks of long-term health issues and economic challenges. Differences in the quality of care between public and private insurance may not only affect maternal morbidity but also influence infant health outcomes. If maternal health complications vary by insurance type, it is likely that neonatal outcomes, including birth weight, will also be affected. Therefore, understanding these relationships is also essential to evaluating the broader implications of healthcare disparities past the mother's health.

To account for potential differences in population characteristics, subsequent models incorporate key control variables: mother's age (MAGER); Cigarette use, pre pregnancy, first, second or third trimester (CIG0, CIG1, CIG2, CIG3); sex of the baby (SEX1); mother's race (raceunified); hispanic origin (hispunified); employment status (EMPSTAT3); and WIC participation. Controlling for these factors ensures a more precise evaluation of the impact of insurance type. Given variations in racial and ethnic classification across all years within the Natality dataset, new race and ethnicity variables were generated. Raceunified (replacing MBRACE from 2009–2013 and MRACE15 from 2014–2022) and hispunified (replacing UMHISP from 2009–2013 and MHISPR from 2014–2022) were generated and standardized

across all years.

The vector of controls that were added were the only variables that were consistently within the sample through all 13 years of study, without compromising the sample size. The variable HCOVPUB1 is assumed to capture the level of Affordable Care Act (ACA) coverage in an area, inherently including Medicaid. By incorporating HCOVPUB1, the analysis adopts a broader categorization of public insurance as a proxy for expanded healthcare access under the ACA. The variable HCOVPRIV1 is used to capture the presence of private health insurance coverage within a given area, serving as a key comparator to public insurance HCOVPUB1.

To account for potential differences in population characteristics, subsequent models introduce maternal race/ethnicity and WIC participation—an indicator of income. The model also includes Cigarette use as low-income communities are associated with higher tobacco and substance use (Poonawalla et al., 2014). These models were run including controls and not including controls. Beyond a standard OLS regression assessing the relationship between insurance type, MORBIDSUM and DBWT, the analysis is further stratified by maternal race/ethnicity and WIC participation. Stratifying the analysis provided a nuanced analysis into whether the predicted outcomes differ across different racial/ethnic and socioeconomic groups. As previously stated, race, ethnicity, and socioeconomic status influences both healthcare access and maternal health outcomes, which allows for a more accurate assessment of the effects of insurance type. The following section presents the empirical findings of this analysis, focusing on the relationship between insurance types on maternal morbidity and birth weight. This relationship can be represented by the two models:

DBWT Model

$$\begin{aligned}\text{DBWT} = \beta_0 &+ \beta_1(\text{HCOVPUB1}) + \beta_2(\text{HCOVPRIV1}) + \beta_3(\text{raceunified}) \\ &+ \beta_4(\text{hispunified}) + \beta_5(\text{MAGER}) + \beta_6(\text{CIG0}) + \beta_7(\text{CIG1}) \\ &+ \beta_8(\text{CIG2}) + \beta_9(\text{CIG3}) + \beta_{10}(\text{SEX1}) + \beta_{11}(\text{empstat3}) + \epsilon\end{aligned}$$

MORBIDSUM Model

$$\begin{aligned}\text{MORBIDSUM} = \beta_0 &+ \beta_1(\text{HCOVPUB1}) + \beta_2(\text{HCOVPRIV1}) + \beta_3(\text{raceunified}) \\ &+ \beta_4(\text{hispunified}) + \beta_5(\text{MAGER}) + \beta_6(\text{CIG0}) + \beta_7(\text{CIG1}) \\ &+ \beta_8(\text{CIG2}) + \beta_9(\text{CIG3}) + \beta_{10}(\text{SEX1}) + \beta_{11}(\text{empstat3}) + \epsilon\end{aligned}$$

Variable Table

Variable	**Description**
HCOVPUB1	Public insurance status
HCOVPRIV1	Private insurance status
raceunified	Racial group (e.g., White, Black, etc.)
hispunified	Racial group (Hispanic)
MAGER	Mother's age
CIG0, CIG1, CIG2, CIG3	Cigarette use levels depending on trimester (0, 1, 2, 3)
SEX1	Sex of the baby (male or female)
empstat3	Employment status of the mother
ϵ	Error term (captures the unexplained variability)

Results

1. General Regressions

Table 1

Regression Results for Birth Weight (DBWT)

Variable	**Public (hcovpub1)**	**Private (hcovpriv1)**
DBWT	145.8*** (-85.07)	-233.3*** (-182.38)

Note: The full vector of controls includes: MAGER. CIG0, CIG1, CIG2, CIG3, SEX1, raceunifed, hispunified, empstat3. Significance levels: ***p < 0.01 **p < 0.05 *p < 0.1

Individuals covered by public health insurance are associated with a positive increase in birth weight. Specifically, an increase in public insurance coverage is associated with an average increase of 145.8 grams in birth weight compared to those not covered by public insurance. This reflects a positive relationship between maternal health outcomes and infant birth weight.

Conversely, individuals covered by private health insurance are associated with a negative decrease in birth weight. The coefficient of -233.3 grams indicates that, on average, babies born to mothers with private health insurance have a lower birth weight compared to those without private insurance. This negative relationship suggests that there may be factors within private insurance coverage, such as limited access to care, that might be affecting maternal health outcomes.

For public health insurance, the t-statistic is -85.07, and for private health insurance, it is -182.38. These large absolute t-statistics suggest that the relationships observed are highly statistically significant, providing strong evidence that both types of health insurance have meaningful effects on birth weight.

The magnitude of the effect is notably different between the two types of insurance. This difference in magnitude may point to varying levels of care or access to maternal health services between public and private health insurance plans. Public Insurance (HCOVPUB1) may offer more comprehensive coverage and better access to healthcare resources for low-income or vulnerable populations, contributing to healthier pregnancy outcomes and higher birth weights. Private Insurance (HCOVPRIV1), on the other hand, could be associated with disparities in the

quality of care, as private insurance coverage might not always guarantee access to the best prenatal care, particularly for marginalized populations.

Table 2

Regression Results Statistics for Maternal Morbidity (MORBIDSUM)

Variable	Public (hcovpub1)	Private (hcovpriv1)
MORBIDSUM	0.00709*** (-14.41)	-0.0292*** (-73.05)

Note. The full vector of controls includes: MAGER. CIG0, CIG1, CIG2, CIG3, SEX1, raceunifed, hispunified, empstat3. Significance levels: ***p < 0.01 **p < 0.05 *p < 0.1.

Table 2 analyzes the effect of the Maternal morbidity variable (MORBIDSUM) on public and private health insurance. An increase in public insurance coverage (HCOVPUB1) is associated with a 0.00709 increase in the probability of maternal morbidity occurring, holding all other factors constant. This suggests that, on average, mothers with public insurance are more likely to experience maternal health complications compared to those without public insurance.

On the other hand, an increase in private insurance coverage is associated with a 0.0292 decrease in the probability of maternal morbidity outcomes. This suggests that mothers with private insurance are less likely to experience maternal health complications compared to those without private insurance. The negative relationship may reflect the generally better quality of prenatal care associated with private insurance, leading to fewer health complications during pregnancy.

The t-statistic for public health insurance (HCOVPUB1) is -14.41, which indicates that the relationship between public insurance and maternal morbidity is statistically significant. The

t-statistic for private health insurance (HCOVPRIV1) is -73.05, indicating that the relationship between private insurance and reduced maternal morbidity is also statistically significant at a high level. This suggests a negative relationship between private insurance and maternal morbidity is also robust and reliable.

Table 3

Regression Results for MORBIDSUM>0

Variable	Public (hcovpub1)	Private (hcovpriv1)
MORBIDSUM	-0.0918*** (-8.63)	0.118*** (-13.74)

Note. The full vector of controls includes: MAGER. CIG0, CIG1, CIG2, CIG3, SEX1, raceunifed, hispunified, empstat3. Significance levels: ***p < 0.01 **p < 0.05 *p < 0.1

As shown in Table 3, an increase in public health insurance coverage (HCOVPUB1) is associated with a 0.0918 decrease in the probability of maternal morbidity outcomes. This suggests that among women who already experience complications, those on public insurance may face less severe health outcomes. The negative relationship indicates that public insurance coverage could potentially mitigate the severity of maternal health complications for mothers already at risk.

An increase in private health insurance (HCOVPRIV1) correlates with a 0.118 increase in the probability of morbidity outcomes, indicating that mothers with private insurance may experience more severe complications. This positive relationship suggests that, for some women, private insurance coverage does not lead to improved outcomes but could be associated with more complicated pregnancies, potentially due to limited access or the quality of care in certain private insurance plans.

It is important to note that a previous regression result showed that private insurance is associated with lower overall rates of maternal morbidity. This raises the possibility that the higher rates of complications observed among those with public insurance may reflect differences in diagnosis, care access, or reporting. Rather than private insurance directly leading to more complications, it may be that individuals with private coverage have greater access to diagnostic services and higher-quality care, resulting in more complete detection and reporting of maternal health issues. This suggests potential reporting bias or disparities in healthcare access may be influencing the observed relationships.

2. Stratification of DBWT on Race

Table 4

Stratification by Race for DBWT

Variable	Model 1: White	Model 2: Black	Model 3: Hispanic
hcovpub1	52.03*** (-26.45)	155.6*** (-31.87)	55.53*** (-18.4)
hcovpriv1	-231.0*** (-143.98)	-206.5*** (-45.64)	-125.5*** (-60.49)

Note. The full vector of controls includes: MAGER. CIG0, CIG1, CIG2, CIG3, SEX1, raceunifed, hispunified, empstat3. Significance levels: ***p < 0.01 **p < 0.05 *p < 0.1

Table 4 displays the stratified regression results for Dependent Birth Weight (DBWT) with public and private insurance, revealing distinct patterns across racial groups. For public health insurance (HCOVPUB1), an increase in coverage is associated with a 52.03 gram increase in infant birth weight for White mothers, a 155.6 gram increase for infants of Black mothers, and a 55.53 gram increase for infants of Hispanic mothers. All of these relationships are statistically significant with a p-value < 0.01, indicating a strong positive relationship between public

insurance and birth weight across all racial groups. The effect is most pronounced for Black mothers, where public insurance is associated with a larger increase in birth weight. In contrast, private health insurance (HCOVPRIV1) is associated with a significant decrease in birth weight across all racial groups. Specifically, private insurance is linked to a -231.0 gram decrease for White mothers, a -206.5 gram decrease for Black mothers, and a -125.5 gram decrease for Hispanic mothers, all of which are statistically significant with a p-value < 0.01. These findings suggest that public insurance is associated with higher birth weight, particularly among Black mothers, while private insurance is associated with lower birth weight across all racial groups.

The positive relationship between public insurance and birth weight may stem from its comprehensive prenatal care for low-income and at-risk populations, improving monitoring and reducing health disparities. Public insurance programs, such as Medicaid, focus on addressing social determinants of health, which can mitigate pregnancy complications and lead to higher birth weights. In contrast, private insurance may be linked to lower birth weight due to higher out-of-pocket costs, underutilization of healthcare services, and gaps in coverage for preventive or maternity care. These factors may contribute to higher pregnancy complications and lower birth weight, particularly when private insurance doesn't ensure equitable access to quality care.

3. Stratification of MORBIDSUM on Race

Table 5

Stratification by Race for MORBIDSUM

Variable	Model 1: White	Model 2: Black	Model 3: Hispanic
hcovpub1	-0.00000919*** (-1.28)	0.000148*** (-10.98)	-0.0000845*** (-8.60)
hcovpriv1	-0.0000521*** (-7.20)	0.000129*** (-9.60)	-0.0000978*** (-9.94)

Note. The full vector of controls includes: MAGER. CIG0, CIG1, CIG2, CIG3, SEX1, raceunifed, hispunified, empstat3. Significance levels: ***p < 0.01 **p < 0.05 *p < 0.1

Table 5 displays the Stratification Results for MORBIDSUM with Race; the coefficients for private and public insurance suggest varying effects across racial groups. For White mothers, an increase in private health insurance coverage (HCOVPRIV1) is associated with a 0.0000521 decrease in the probability of maternal morbidity (MORBIDSUM) occurring, while an increase in public insurance coverage (HCOVPUB1) leads to a 0.00000919 decrease, indicating a smaller effect of public insurance on maternal morbidity.

For Black mothers, private insurance is associated with a 0.000129 increase in maternal morbidity, while public insurance is linked to a 0.000148 increase, indicating a slight rise in morbidity. Therefore, Black mothers are correlated with a higher chance of having a birth complication under public insurance compared to private insurance.

Although it seems that for Hispanic mothers, there is a decreased probability of experiencing a birth complication under private and public insurance compared to Black mothers, there is still an observed difference between the two types of insurance. Hispanic mothers have a decreased probability of complications, albeit still higher under public insurance than private insurance. The results are statistically significant, with there being a 0.0000845 decrease in the probability of experiencing complications under public insurance compared to a 0.00000978 decrease in the probability of experiencing complications under private insurance.

4. Stratification of DBWT on WIC

Table 6

Stratification by DBWT with WIC

Variable	Model 1: WIC(Yes)	Model 2: WIC(No)
hcovpub1	4.265*** (-137.06)	2.898*** (-95.68)
hcovpriv1	4.210*** (-135.31)	2.674*** (-88.2)

Note. The full vector of controls includes: MAGER. CIG0, CIG1, CIG2, CIG3, SEX1, raceunifed, hispunified, empstat3. Significance levels: ***p < 0.01 **p < 0.05 *p < 0.1

Table 6 examines the relationship between private insurance and WIC vs. non-WIC participants. An increase in private insurance coverage (HCOVPRIV1) is associated with a 4.210 gram increase in the baby's birth weight (DBWT) for WIC participants, while non-WIC participants experience a 2.674 gram increase. This demonstrates a positive association between private insurance coverage and birth weight for both groups, with a more pronounced effect for those who receive WIC benefits.

When examining the relationship between public insurance and WIC vs. non-WIC participants, an increase in public insurance coverage (HCOVPUB1) is associated with a 4.265 gram increase in the baby's birth weight for WIC participants, compared to a 2.898 gram increase for non-WIC participants. This also indicates a positive relationship between public insurance coverage and infant birth weight for both WIC and non-WIC participants, with a more pronounced effect on those who receive WIC benefits.

Both models reveal a consistent and positive association between insurance coverage—whether public or private—and infant birth weight across WIC and non-WIC

participants. Notably, the impact of both types of insurance appears to be more beneficial for WIC participants. Therefore, WIC participation may amplify the benefits of insurance coverage, potentially by providing additional nutritional and prenatal support that complements general access to healthcare services.

5. Stratification of MORBIDSUM on WIC

Table 7

Stratification by MORBIDSUM with WIC

Variable	Model 1: WIC(Yes)	Model 2: WIC(No)
hcovpub1	-0.000044*** (-4.99)	0.00000116*** (-0.13)
hcovpriv1	-0.0000482*** (-5.45)	-0.0000326*** (-3.65)

Note. The full vector of controls includes: MAGER. CIG0, CIG1, CIG2, CIG3, SEX1, raceunifed, hispunified, empstat3. Significance levels: ***p < 0.01 **p < 0.05 *p < 0.1

When examining the relationship between WIC participants and MORBIDSUM, an increase in private insurance coverage (HCOVPRIV1) is associated with a 0.0000482 decrease in the likelihood of maternal morbidity outcomes. For non-WIC participants, an increase in private insurance coverage (HCOVPRIV1) is associated with a 0.0000326 decrease in the likelihood of maternal morbidity outcomes.

For WIC participants, an increase in public insurance coverage (HCOVPUB1) is associated with a 0.000044 decrease in the likelihood of morbidity outcomes. For non-WIC participants on MORBIDSUM, an increase in public insurance coverage (HCOVPUB1) is associated with a 0.00000116 increase in the likelihood of morbidity outcomes.

Table 8

Stratification by MORBIDSUM > 0 with WIC

Variable	Model 3: WIC(Yes)	Model 4: WIC(No)
hcovpub1	0.00671*** (-30.65)	0.00567 (-33.62)
hcovpriv1	0.00672*** (-30.7)	0.00573 (-33.93)

Note. The full vector of controls includes: MAGER. CIG0, CIG1, CIG2, CIG3, SEX1, raceunifed, hispunified, empstat3. Significance levels: ***p < 0.01 **p < 0.05 *p < 0.1

In contrast, Table 8, which displays the Stratification of MORBIDSUM with WIC, for WIC participants with MORBIDSUM >0, an increase in private insurance coverage (HCOVPRIV1) is associated with a 0.00672 increase in the likelihood of comorbidity outcomes. For non-WIC participants with MORBIDSUM > 0, an increase in private insurance coverage (HCOVPRIV1) is associated with a 0.00573 increase in the likelihood of comorbidity outcomes.

For WIC participants with MORBIDSUM > 0, an increase in public insurance coverage (HCOVPUB1) is associated with a 0.00671 increase in the likelihood of comorbidity outcomes. For non-WIC participants with MORBIDSUM > 0, an increase in public insurance coverage (HCOVPUB1) is associated with a 0.00567 increase in the likelihood of comorbidity outcomes.

Across both models, private and public insurance coverage exhibit similar directional trends in their association with maternal morbidity outcomes. For both WIC and non-WIC participants, increased insurance coverage is associated with a slight decrease in the overall likelihood of experiencing maternal morbidity (as measured by MORBIDSUM), suggesting that access to either form of insurance may offer a protective effect against the occurrence of

maternal health complications.

When restricting the analysis to cases where MORBIDSUM > 0, the relationship shifts. For both WIC and non-WIC participants, increased insurance coverage (both private and public) is associated with a slight increase in the likelihood of experiencing additional comorbidities. This may reflect better diagnostic access and more comprehensive care among insured individuals, who are more likely to have multiple conditions identified and treated. While the patterns are generally consistent across WIC and non-WIC groups, the effects are slightly more pronounced among WIC participants, particularly in models measuring comorbid outcomes. This suggests that once complications arise, WIC recipients benefit from more thorough medical monitoring and follow-up care, likely due to the interaction between insurance coverage and targeted nutritional support programs.

Interestingly, private insurance is associated with a small increase in maternal morbidity among WIC participants in both the comorbidity and MORBIDSUM > 0 models. This indicates that for low-income mothers (as proxied by WIC participation), private coverage does not necessarily lead to improved health outcomes once complications occur—and may even be linked to higher recorded severity. In contrast, for non-WIC participants, private insurance is associated with a small decrease in overall maternal morbidity in the full MORBIDSUM model, suggesting comparatively better outcomes for higher-income mothers with private coverage.

Limitations

This study has several limitations that must be considered when interpreting the results. First, the analysis relies on data spanning from 2009 to 2022, which may not fully capture long-term trends or provide a comprehensive understanding of conditions prior to the Great

Recession. The lack of data on public insurance variables, such as Medicaid, before 2009 presents a notable constraint, as it prevents the inclusion of pre-recession periods in the analysis of insurance effects. Consequently, the study cannot assess how maternal health outcomes might have differed in the years leading up to the recession, limiting the ability to evaluate the full impact of economic shifts on maternal morbidity and birth weight.

Another key limitation is the availability of data at the county level, which is the only common identifier across the merged data from IPUMS. While county-level data allows for some geographic comparison, it also means that counties with fewer than 65,000 observations were excluded from the sample. This reduces the geographic diversity of the data and may result in the exclusion of smaller regions that could exhibit different trends or health outcomes.

The study faces challenges with variable limitations. Many variables are either missing or inconsistent across the years of the study, which constrained the selection of control variables. These inconsistencies further limit the scope of the analysis, as the inability to include certain key controls may introduce potential biases into the regression results. The limited number of available control variables means that the omitted variables could distort the true relationships between insurance types and maternal health outcomes. Despite these limitations, the findings provide valuable insights into the intersection of insurance coverage, socioeconomic factors, and maternal health. Future research would benefit from more comprehensive and consistent data.

Conclusion

This study provides a nuanced understanding of how public and private health insurance coverage impacts birth weight and maternal morbidity, including differences across racial and socioeconomic subgroups. The findings challenge conventional assumptions that private

insurance universally yields better maternal and infant outcomes. Public insurance coverage, on average, is associated with a significant increase in infant birth weight, particularly among Black and Hispanic mothers. This suggests that public insurance programs, such as Medicaid, may play a crucial role in supporting vulnerable populations by improving access to prenatal care and mitigating social determinants of poor health outcomes. Notably, the positive effects of public insurance are amplified among WIC participants, further emphasizing the importance of integrated nutritional and healthcare support for low-income families. Conversely, private insurance is associated with a reduction in birth weight across all racial groups. While this initially appears counterintuitive, the results may reflect structural limitations within certain private plans—such as underutilization of care, high out-of-pocket costs, or fragmented service delivery—particularly for marginalized populations. However, private insurance is linked to lower rates of maternal morbidity overall, suggesting that while it may not always promote optimal birth weight, it may still offer protection against certain pregnancy-related complications.

The stratified analyses highlight substantial racial disparities. Public insurance has the greatest positive impact on birth weight for Black mothers, but is also linked to a slightly increased risk of maternal morbidity in this group. This raises concerns about unequal care quality and access within public systems that serve historically underserved communities. Among Hispanic mothers, both public and private insurance are associated with relatively better outcomes, though the benefits are more modest compared to those for Black mothers. When incorporating WIC participation into the analysis, both public and private insurance show more favorable effects on birth weight and maternal morbidity. This suggests that nutritional support

programs like WIC may strengthen the benefits of insurance by addressing additional social and environmental risk factors. Policymakers and healthcare providers should consider these complex dynamics when designing interventions aimed at improving maternal health disparities.

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