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Research Article

# DOES DISABILITY STATUS AFFECT MATERNAL CARE AROUND PREGNANCY? EVIDENCE FROM NATIONAL SURVEY OF FAMILY GROWTH (NSFG) 2013-2015 DATA IN UNITED STATES

***Munir AHMED*[1]** ***Shehnaz Hakim BALOCH*[2]**

[1]M.B.B.S, MPH, Ph.D., Health Services Research
Department of Health Administration & Policy
George Mason University, United States
[2]Assistant Director, Office of Director General Health Services
Government of Balochistan, Quetta, Pakistan.
Corresponding author; mahmed24@gmu.edu

**Abstract***: It is estimated that approximately 12% of reproductive age women have some kind of disability; which is measured as self-reported difficulty in performing basic functions concerning movement, vision, hearing, or cognition. Little research has been conducted on the reproductive health of women with disabilities using nationally representative survey data; thus the body of scientific knowledge on this subject is limited. The purpose of this study was to examine the effect of disability status (both mental and physical) among women on prenatal care and post-pregnancy care in the U.S. using nationally representative National Survey of Family Growth (NSFG) data. It's a retrospective, quantitative, observational study that uses nationally representative NSFG data for the United States. The NSFG survey data is made available for research by the National Center for Health Statistics at the Centers for Disease Control and Prevention (CDC). The 2013-2015 NSFG's female respondent file contains 5699 records one for each woman interviewed whereas the pregnancy respondent file contains 9358 records each related to pregnancy. The data about disabilities-related variables were part of the female respondent file therefore using unique respondent ID files were merged and logistic regression models were built using prenatal and postnatal care as dependent and disability status as the main independent variable. Women with Medicaid were significantly less likely as compared to those with private insurance to have received prenatal care in the last 12 months. Women with less than 12 years of education were less likely to have received post pregnancy care as compared to those with college education. Although this study did not find significant effects of disability on the utilization of prenatal and post-pregnancy care, further research is needed on this subject with datasets that include comprehensive information about the broader spectrum of disability status of women.*

**Keywords***: United States, health disparities, maternal health, disabilities, Access*

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## 1. Introduction

It is estimated that approximately 12% of reproductive age women have some kind of disability; which is measured as self-reported difficulty in performing basic functions concerning movement, vision, hearing, or cognition [1]. Little research has been conducted on the reproductive health of women with disabilities thus the body of scientific knowledge on this subject is limited [1].

Some regional studies have documented disparities in sociodemographic, prenatal, and pregnancy-related complications between women with and without disabilities [2, 3]. A regional study in Rhode Island, for instance, found that women with disabilities tend to be younger, poorer, less educated, and more likely to be on public assistance as compared to women without disabilities. Furthermore, the study also found that prior to pregnancy women with disability were more likely to have ever been diagnosed with diabetes and asthma and were less likely to take daily prenatal vitamins. The same study also reported that women with disabilities were more likely to report a pregnancy complication as compared to women without disabilities [2, 3].

A study conducted at a multidisciplinary outpatient reproductive health clinic for women with physical disabilities in Michigan reported that women with disabilities were more likely to have pregnancy-related complications, deliver preterm and have low birthweight infants as compared to women without disabilities [3].

A study in California found that women with intellectual and developmental disabilities (IDD) and hearing disabilities were worse off in terms of prenatal care utilization as compared to not only women without disabilities but also women with other types of disabilities [4].

The purpose of this study was to examine the effect of disability status (both mental and physical) among women on prenatal care and post-pregnancy care.

## 2. Methods

### 2.1. Overview

The study used a life course approach; this approach to health and disease etiology focuses on the study of long-term effects of exposures (physical and social) that occur in gestation, childhood, adolescence, young adulthood, and later life [5]. According to the life course model health of an organ system depends not only on influences later in life but also on peak functional capacity that is attained early in life. Thus both developmental processes and contextual factors in early life play a key role. Low income settings play a dual role by affecting inherited health capital in early life and increased environmental challenges in later life [6, 7].

Biological embedding, which means experiences in early life affect the course of human development through their interaction with immunologic, endocrine, and neural systems as well as gene expression, is a fundamental concept in Life Course Health Development (LCHD) [8]. Similarly, LCHD emphasizes the importance of events across the lifespan as well as across generations for health development trajectories [8]. Therefore, access to prenatal and post-pregnancy care (outcome variables of this study) for women with disabilities are important not only for them but could impact the health trajectories of their children in the long term [8].

### 2.2. Data

This research used the National Survey of Family Growth (NSFG) data, the utilization of prenatal, and post-pregnancy care was used as main out-come variables [9]. For the analysis disability status was used as one of the key independent variables and other important independent variables were identified by looking at previous research. The analysis plan consisted of conducting a bivariate analysis to assess for significant differences based on selected independent variables. Subsequently, separate logistic regression analysis was built for each outcome of interest (prenatal and post-pregnancy care utilization). The prenatal care question in the NSFG questionnaire applied only to respondents who had a pregnancy in the last 12 months (N=1623) and post-pregnancy care question was applicable to survey respondents whose most recent live birth was within the last 12 months (N= 1121) and the number of overall positive responses to the disability-related question was 1942.

The National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention is the agency responsible for planning and administration of national surveys for family growth (NSFG). The NSFG is a part of the national federal statistical system and aims to provide national estimates of factors affecting pregnancy, utilization of medical care for maternal, child, and reproductive health, and factors associated with family life. The 2013-2015 NSFG's female respondent file contains 5699 records one for each woman interviewed during 2013-2015 whereas the pregnancy respondent file contains 9358 records each related to pregnancy. The data about disabilities-related variables were part of the female respondent file therefore the files were merged to add disabilities-related information to the pregnancy record file using unique respondent ID. This resulted in the addition of disability related variable columns to previous records in the pregnancy record file, matched by unique respondent ID. The dataset included 606 women who were currently pregnant and 8746 that were not pregnant at the time of the interview; the overall number of observations under study was 9352.

NSFG is a well-reputed data source for information on marriage, divorce, family life, and reproductive health in the United States. The NSFG employs a stratified, multi-stage survey design that pools participants between 15-44 years of age (women and men) from all over the United States [10,11]. The overall number of observations in the sample under study was 9352.

### 2.3. Measures

The outcome and independent variables for this study were selected using the Life Course Model that emphasizes the importance of genetic and sociodemographic factors from conception and developmental periods to health trajectories of individuals and populations in later life. The outcome variables prenatal care and post-pregnancy care are important for life long health of individuals and populations. The independent variables included in this study represent key sociodemographic factors that affect long term health trajectory. The outcome variables recorded in the survey datasets were assessed categorically using the following question;

In the past 12 months, have you received post-pregnancy care? (N= 1121) yes/no

In the past 12 months, have you received prenatal care? (N=1623) yes/no

The main disability-related independent variable was created merging the variables in the NSFG survey dataset about the difficulty in seeing, difficulty with memory and decision making, difficulty with walking or climbing stairs, difficulty with doing errands, and difficulty in dressing or bathing. The disability-related variable (N= 1942) consisted of two categories (Yes/No). Other independent variables included maternal age ( 24 and under, 25-34, >34), parity ( 1, 2-3, >4), payment method for delivery

(private insurance, Medicaid), marital status ( married to a person of the opposite sex, never married, divorced/widowed), education ( more than 12 years, 12 years, less than 12 years), race and ethnicity (non-Hispanic white, Hispanic, non-Hispanic black, non-Hispanic other). Similarly, being on public assistance (yes, no), place of residence (city, suburban, rural), and federal poverty level income (0%-199 – 200% and above) were also included in the study as key independent variables [12, 13].

### 2.4. Statistical approach

The statistical approach focused on descriptive statistics with raw counts and weighted means, chi-square analysis to explore significant differences in access to prenatal and post-pregnancy care among sub-groups (categories) of independent variable; for instance does access to prenatal care and post-pregnancy care differ significantly among maternal age groups. Subsequently, logistic regression models for each outcome of interest were created using disability status as one of the key independent variables. The survey data were weighted using the final post-stratified fully adjusted case weight variable, stratum variable, and cluster/panel variable provided in the 2013-2015 user guide [14, 15].

## 3. Results

Among respondents, 70.33% of the women received prenatal care in the last 12 months whereas 29.27% did not. Similarly, among survey respondents, 87.37% of women received post-pregnancy care in the last 12 months whereas 12.63% did not. Among 18.87% of the survey respondents reported having at least one of the listed disabilities, whereas 81.13% did not report a disability; the listed disabilities included, has any serious difficulty seeing ( yes = 4.84%, no=95.16%), has any serious difficulty with memory or decision making (yes = 13.3%, no= 86.7%), has serious difficulty walking or climbing stairs ( yes= 5.13%, no = 94.87%), has any serious difficulty dressing or bathing ( yes = 1%, no = 99%), and has any difficulty doing errands alone due to physical /mental/and emotional condition ( yes = 4.48%, no = 95.52%).

Among survey respondents 51.39% of the survey respondents were non-Hispanic Whites, 23.69% were Hispanics, 15.57% were non-Hispanic Blacks and 9.4% were non-Hispanic Others. In terms of age, 5.87% of respondents were 24 and under, 41.22% were in the 25-34 age group and 52.91% were above 34 years of age. Among survey respondents 55.22% had education beyond high school, 22.93% had completed high school and 21.85% did not finish high school. Private insurance was the method of payment for delivery among 55.35% of survey respondents whereas 44.65% paid through Medicaid. The sociodemographic characteristics of the survey population are presented in Table 1 (titled sociodemographic characteristics)

There were significant differences (based on the chi-square test of independence) in prenatal care utilization based on maternal age and parity. Women in the 25-34 years age group and those with parity of 2 or 3 were more likely to receive prenatal care. However, when assessed through a Chi-square test, the differences in prenatal care utilization by disability status, race and ethnicity, marital status, education, and payment method were not significant.

In terms of post-pregnancy care utilization, there were significant differences based on the payment method for delivery (private insurance or Medicaid) and maternal education. Women with high school education were more likely to receive post-pregnancy care similarly women with private insurance were also more likely to receive post-pregnancy care. However, differences in post-pregnancy

care utilization by other sociodemographic characteristics such as disability status, maternal age, being on public assistance, and geographic location of residence were not statistically significant when assessed with a Chi-square test. The distribution of sociodemographic characteristics by utilization of prenatal and post-pregnancy are presented in table 2 (titled bivariate analysis)

**Table 1**. Sociodemographic characteristics of respondents

| Characteristics | Unweighted count (weighted %) |
|---|---|
| **Prenatal care** | |
| Yes | 1109 (70.73%) |
| No | 514 (29.27%) |
| **Post-pregnancy care** | |
| Yes | 945 (87.37%) |
| No | 176 (12.63%) |
| **Disability** | |
| Yes | 1942 (18.87%) |
| No | 7410 (81.13%) |
| **Race** | |
| Non-Hispanic White | 3836 (51.39%) |
| Hispanic | 2531 (23.69%) |
| Non- Hispanic Black | 2128 (15.57%) |
| Non-Hispanic Other | 857 (9.4) |
| **Age** | |
| 24 and under | 663 (5.87%) |
| 25-34 | 4359 (41.22%) |
| >34 | 4330 (52.91%) |
| **Marital Status** | |
| Married to the person of the opposite sex | 4074 (55.08%) |
| Never married | 3294 (26.21%) |
| Divorced, Widowed, annulled, separated | 1987 (18.71%) |
| **Maternal education** | |
| Beyond high school | 4618 (55.22%) |
| High school | 2315 (22.93%) |
| Less than high school | 2419 (21.85%) |
| **Payment for delivery** | |
| Private insurance | 932 (55.35%) |
| Medicaid | 1176 (44.65%) |
| **Been on Public assistance last year** | |
| Yes | 52.51 (45.9%) |
| No | (54.91%) |
| **Federal poverty level** | |
| 0% – 199% | 6030 (54.72%) |
| 200% and above | 3322 (45.28%) |
| **Geographical location** | |
| City | 3579 (32.01%) |
| Sub-urban | 4086 (51.09%) |
| Rural | 1687 (16.89%) |
| **Parity** | |
| 1 pregnancy | 3474 (37.37% |
| 2 or 3 pregnancies | 4178 (45.38%) |
| 4 or more pregnancies | 1700 (17.25%) |

**Table 2.** Comparing sociodemographic characteristics of respondents in terms of pregnancy care

| | Prenatal Care | | | Post Pregnancy Care | | |
|---|---|---|---|---|---|---|
| **Characteristics** | **Yes(%weight)** | **No(%weight)** | **P** | **Yes(%weight)** | **No(%weight)** | **P** |
| **Disability** | | | 0.19 | | | 0.26 |
| Yes | 178 (9.93) | 152 (6.5) | | 131 (10.46) | 43 (2.48) | |
| No | 938 (60.8) | 362 (22.86) | | 814 (76.91) | 133 (10.15) | |
| **Maternal age** | | | 0.02* | | | 0.48 |
| 24 or less | 172 (11.79) | 69 (3.41) | | 143 (16.41) | 43 (2.47) | |
| 25 to 34 | 746 (46.42) | 278 (14.33) | | 627(53.16%) | 82 (6.2) | |
| >34 | 191 ( 12.53) | 167 (11.52) | | 175(17.81%) | 51 ( 3.95) | |
| **Race and ethnicity** | | | 0.41 | | | 0.32 |
| Non- Hispanic White | 417(35.82) | 178 (14.44) | | 359 (41.36) | 42 (3.90) | |
| Hispanic | 335 (17.27) | 115 (5.2) | | 290 (23.01) | 65 (4.94) | |
| Non-Hispanic Black | 237 (9.95) | 158 (6.70) | | 181 (12) | 46 (2.54) | |
| Non-Hispanic Other | 120 (7.69) | 63 (2.93) | | 115 (11) | 23 (1.25) | |
| **Marital status** | | | 0.61 | | | 0.35 |
| Married to the person of the opposite sex | 494 (38.97) | 135 (14.47) | | 441 (47.39) | 58 (5.62) | |
| Never married | 431 (22.45) | 246 (9.30) | | 368 (30.21) | 72 (4.21) | |
| Divorced, widowed, annulled, or separated | 184 (9.32) | 133 (5.49) | | 136 (9.77) | 46 (2.8) | |
| **Education** | | | 0.37 | | | 0.00* |
| >12 Years | 553 (37.93) | 219 (17.13) | | 460 (42.2) | 50 (3.50) | |
| 12 Years (high school) | 318 (20.14) | 137 (5.45) | | 282 (29.12) | 53 (3.13) | |
| <12 years | 238 (12.67) | 158 (6.68) | | 203 (16.05) | 73 (6.0) | |
| **Payment method** | | | 0.29 | | | 0.04* |
| Private insurance | 254 (47.6) | 38 (6.91) | | 241 ( 48.99) | 19 (3.45) | |
| Medicaid | 290 (37.25) | 83 (8.24) | | 265 (40.43) | 61 (7.13) | |
| **Public assistance in the last 12 months** | | | 0.60 | | | 0.13 |
| Yes | 735 (39.36) | 344 (14.9) | | 636 (50.14) | 145 (9.53) | |
| No | 374 (31.37) | 170 (14.37) | | 309 (37.23) | 31 (3.1) | |
| **Federal Poverty level** | | | 0.25 | | | 0.24 |
| 0% - 199% | 778 (46.62) | 368 (15.9) | | 668 (60.42) | 153 (10.42) | |
| 200% and above | 331 ( 24.11) | 146 (13.37) | | 277 (26.94) | 23 (2.21) | |
| **Geographical location** | | | 0.35 | | | 0.58 |
| City | 470 (24.3) | 232 (9.79) | | 373 (30.24) | 77 (5.38) | |
| Sub-Urban | 467 (35.31) | 205 (16.67) | | 418 (42.0) | 63 (4.8) | |
| Rural | 172 (11.13) | 77 (2.8) | | 154 (15.13) | 36 (2.45) | |
| **Parity** | | | 0.00 * | | | 0.5 |
| 1 pregnancy | 408 (26.19) | 152 (8.37) | | 354 (33.26) | 55 (3.84) | |
| 2 or 3 pregnancies | 501 (32.13) | 209 (10.89) | | 438 (40.61) | 74 (5.22) | |
| 4 or more pregnancies | 200 (12.42%) | 153 (10.0) | | 153 (13.5) | 47 (3.57) | |

* Chi-Square results; p <0.05

### 3.1. Prenatal Care

Logistic regression analysis shows that women with disabilities (OR 0.65, 95% CI: 0.23 – 1.78) were less likely to have received prenatal care as compared to women without disabilities but this was

not significant. Women whose delivery costs were paid through Medicaid as compared to private insurance were significantly less likely to have received prenatal care in the last 12 months (OR 0.55, 95% CI: 0.31- 0.99), likewise, women with Parity of 4 and above were significantly less likely to have received prenatal care in last 12 months as compared to those who had Parity of 1, (OR 0.31, 95% CI: 0.11 - 0.82). Women with income at 0%-199% of the federal poverty level (FPL) were significantly more likely (OR 2.44, 95% CI: 1.13 – 5.24) to have received prenatal care as compared to women with income at 200% and above FPL. These findings are listed in table 3 (titled results of logistic regression analysis for prenatal care).

**Table 3.** Results of logistic regression analysis for prenatal care

| | Prenatal care in the last 12 months | |
|---|---|---|
| **Characteristics** | **Adjusted Odds Ratios** | **95% Confidence Interval** |
| **Disability** | | |
| Yes | 0.65 | (0.23 -1.78) |
| No | Reference | |
| **Race** | | |
| Non – Hispanic White | Reference | |
| Hispanic | 1.85 | (0.64 - 5.32) |
| Non- Hispanic Black | 0.79 | (0.32 – 1.96) |
| Non – Hispanic Other | 0.97 | (0.28 – 3.39 |
| **Age** | | |
| 24 and under | 1.24 | (0.48 -3.18) |
| 25-34 | Reference | |
| >34 | 0.36 | (0.12 – 1.06) |
| **Marital status** | | |
| Married to the person of the opposite sex | Reference | |
| Never married | 0.93 | (0.34 – 2.52) |
| Divorced, widowed, separated | 0.57 | (0.18, 1.75) |
| **Maternal education** | | |
| Beyond high school | Reference | |
| High school | 1.16 | (0.46 – 2.94) |
| Less than high school | 0.89 | (0.29 – 2.71) |
| **Payment for the delivery** | | |
| Private insurer | Reference | |
| Medicaid | 0.55* | (0.31 – 0.99) |
| **Been on public assistance last year** | | |
| Yes | 0.55 | (0.27 – 1.12) |
| No | Reference | |
| **Federal poverty level** | | |
| 0-199% | 2.44* | (1.13 – 5.24) |
| 200% and above | Reference | |
| **Geographic location** | | |
| City | Reference | |
| Sub-urban | 0.66 | (0.33 – 1.33) |
| Rural | 1.44 | (0.48 – 4.34) |
| **Parity** | | |
| 1 pregnancy | Reference | |
| 2 or 3 pregnancies | 1.03 | (0.50 – 2.15) |
| 4 or more pregnancies | 0.31* | (0.12 – 0.82) |

* Results of logistic regression analysis; $p < 0.05$

Women that have been on public assistance in the last 12 months (themselves or a family member) were less likely ( OR 0.55, 95% CI: 0.27 – 1.12) to have received prenatal care as compared to those, not on public assistance, but this was not significant.

Never married women (OR 0.93, 95% CI 0.38-2.7) and women whose response to the marital status question included divorced, widowed, annulled, or separated ( OR 0.57, 95% CI: 0.18 – 1.75) were less likely to have received prenatal care as compared to women married to a person of the opposite sex. As compared to those with college education, women with 12 years education (OR 1.16, 95% CI: 0.46- 2.94) were more and those with less than 12 years education (OR 0.89, 95% CI: 0.29 – 2.71) were less, likely to have received prenatal care respectively; but this was not significant.

### 3.2. Post-pregnancy care

Women with disabilities were less likely (OR 0.75, 95% CI: 0.28 – 1.95) to have received post-pregnancy care as compared to those without disabilities, though this was not statistically significant. Women with less than 12 years of education were significantly less likely (OR 0.20, 95% CI: 0.05 – 0.72) to have received post pregnancy care as compared to those with college level education. Hispanics (OR 0.62, 95% CI: 0.25 – 1.55), non-Hispanic Black (OR 0.71, 95% CI: 0.16 – 3.12), and non-Hispanic Other women (OR 0.53, 95% CI: 0.11 – 2.49) were all less likely to have received post-pregnancy care as compared to non-Hispanic White Women, but this was not significant. These findings are listed in table 4 (titled results of logistic regression for post-pregnancy care).

**Table 4.** Results of logistic regression for post-pregnancy care

| | Prenatal care in the last 12 months | |
|---|---|---|
| **Characteristics** | **Adjusted Odds Ratios** | **95% Confidence Interval** |
| **Disability** | | |
| Yes | 0.75 | (0.28 – 1.95) |
| No | Reference | |
| **Race** | | |
| Non – Hispanic White | Reference | |
| Hispanic | 0.62 | (0.25 – 1.550 |
| Non- Hispanic Black | 0.71 | (0.16 – 3.12) |
| Non – Hispanic Other | 0.53 | (0.11 – 2.49) |
| **Age** | | |
| 24 and under | 0.52 | (0.20 – 1.31) |
| 25-34 | Reference | |
| >34 | 1.02 | (0.33 – 3.08) |
| **Marital status** | | |
| Married to the person of the opposite sex | Reference | |
| Never married | 1.57 | (0.63 – 3.92) |
| Divorced, widowed, separated | 0.40 | (0.08 – 1.90) |
| **Maternal education** | | |
| Beyond high school | Reference | |
| High school | 0.57 | (0.13 – 2.44) |
| Less than high school | 0.20* | (0.05 – 0.72) |
| **Payment for the delivery** | | |
| Private insurer | Reference | |
| Medicaid | 0.97 | (0.43 – 2.18) |
| **Been on public assistance last year** | | |
| Yes | 0.97 | (0.43 – 2.18) |
| No | Reference | |
| **Federal poverty level** | | |

| | | |
|---|---|---|
| 0-199% | 0.94 | (0.11 – 7.48) |
| 200% and above | Reference | |
| **Geographic location** | | |
| City | Reference | |
| Sub-urban | 0.59 | (0.25 – 1.37) |
| Rural | 0.89 | (0.35 – 2.2) |

***Table 4. continued***

| | | |
|---|---|---|
| **Parity** | | |
| 1 pregnancy | Reference | |
| 2 or 3 pregnancies | 0.78 | (0.38 – 1.60) |
| 4 or more pregnancies | 0.84 | (0.44 – 2.57) |

* Results of logistic regression ; p <0.05

Women on Medicaid ( OR 0.97, 95% CI: 0.43 – 2.18), public assistance ( OR 0.76, 95% CI: 0.19 – 2.99) and those with income at 0%-199% FPL ( OR 0.94, 95% CI: 0.11 – 7.48), were less likely to have received post-pregnancy care as compared to those with private insurance, not on public assistance, and income level at 200% and above FPL respectively. But this was not significant.

## 4. Discussion

This study did not find significant effects of disability on the utilization of either prenatal or post-pregnancy care. Effects of disability on access to other areas of care have been documented in previous research, a possible explanation could be the limited number of disability that was included in NSFG surveys. The disabilities included in the survey do not cover the entire spectrum of disabilities. This study, however, found that women with less than high school education were less likely to receive post-pregnancy care. Women with four or more pregnancies were less likely to receive prenatal care. Women on Medicaid (a government program that provides healthcare insurance to low-income families and individuals) were less likely to receive prenatal care as compared to those with private insurance. These findings are consistent with previous research and highlight the importance of underlying determinants of health such as education and poverty. Viewed from a biological embedding and life course health development (LCHD) standpoint these findings indicate that inadequate access to healthcare around pregnancy for low income and less educated mothers not only have immediate consequences in term of their pregnancy outcomes but may affect the long term health trajectories of the newborns and their mothers.

### 4.1. Limitations

A limitation of the study was the measurement of disability status which was restricted and did not include the overall spectrum of disabilities hence the small pool of women with disabilities (N=1942), moreover, questions related to prenatal and post pregnancy-related care were again restricted to last 12 months. Collection of disability data as self-reported was another limitation the actual number of people with disability may have been higher than those who chose to self-report. Moreover, the disability questions were limited and did not include the whole spectrum of mental and physical disabilities.

## 5. Conclusion

Using nationally representative National Family Growth data (2013-2015) this study looked at how disabilities (mental and physical) affected utilization of prenatal and post-pregnancy care. Although this study did not find a statistically significant effect of disability on the utilization of prenatal and post-pregnancy care further research needs to be conducted on these subjects with larger datasets that include comprehensive information about the disability status of women during pregnancy.

## Ethical Statement

This research has been conducted using secondary data from the National Survey of Family Growth (NSFG) made available by the National Center of Health Statistics at the Centers for Disease Control and Prevention (CDC) in the United States. These national survey datasets are made available to researchers after all the personally identifiable information has been removed by the United States National Center of Health Statistics. Thus, the data used for this analysis did not contain any personally identifiable information from participants as required by law in the United States. These surveys are conducted by United States federal government agencies and data collection and dissemination to researchers is made in strict compliance with laws and ethical standards. Therefore, this secondary analysis did not require IRB approval, as no interaction with human and or animal subjects or their personally identifiable information was made.

## Compliance to the Research and Publication Ethics:

This study was carried out in compliance with responsible conduct in research and adheres to rules of research and publication.

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