



Published in final edited form as:

Disabil Health J. 2025 July ; 18(3): 101779. doi:10.1016/j.dhjo.2025.101779.

Associations between disability status and stressors experienced due to the COVID-19 pandemic among women with a recent live birth, 2020

Megan Steele-Baser, PhD^{1,2}, Jennifer M. Bombard, MSPH¹, Cynthia H. Cassell, PhD, MA¹, Katherine Kortsmitt, PhD, MPH³, JoAnn M. Thierry, PhD⁴, Denise V. D'Angelo, MPH⁵, Sascha R. Ellington, PhD⁶, Beatriz Salvesen von Essen, DrPH¹, Antoinette T. Nguyen, MD, MPH¹, Theresa Cruz, PhD⁷, Lee Warner, PhD, MPH¹

¹Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention (CDC), Atlanta, Georgia, USA

²Oak Ridge Institute for Science and Education, CDC Research Participation Programs, Oak Ridge, Tennessee, USA

³Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion, CDC, Atlanta, Georgia, USA

⁴Division of Human Development and Disability, National Center on Birth Defects and Developmental Disabilities, CDC, Atlanta, Georgia, USA

⁵Division of Violence Prevention, National Center for Injury Prevention and Control, CDC, Atlanta, Georgia, USA

Corresponding author: Megan Steele-Baser, PhD, Division of Reproductive Health, CDC, 4770 Buford Hwy, Bldg. 107, MS S107-2, Atlanta, GA 30341, USA, MSteele-Baser@cdc.gov.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Disclaimer: The findings and conclusions of this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC) nor the National Institutes of Health.

Conflicts of Interest: The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Previous presentation of abstracts at meetings: Parts of this work were presented at the 2023 CityMatCH Maternal and Child Health Leadership annual conference and the 2023 American Public Health Association annual meeting.

CRediT authorship contribution statement:

Megan Steele-Baser: Conceptualization, Writing – original draft, Formal analysis, Methodology, Project administration

Jennifer M. Bombard: Conceptualization, Writing – original draft, Formal analysis, Methodology, Project administration

Cynthia H. Cassell: Conceptualization, Writing – review & editing, Methodology, Supervision

Katherine Kortsmitt: Conceptualization, Writing – review & editing, Methodology

JoAnn M. Thierry: Conceptualization, Writing – review & editing

Denise V. D'Angelo: Conceptualization, Writing – review & editing, Methodology

Sascha R. Ellington: Conceptualization, Writing – review & editing

Beatriz Salvesen von Essen: Conceptualization, Writing – review & editing

Antoinette T. Nguyen: Conceptualization, Writing – review & editing

Theresa Cruz: Conceptualization, Writing – review & editing

Lee Warner: Conceptualization, Writing – review & editing, Methodology, Supervision

⁶Influenza Division, National Center for Immunization and Respiratory Diseases, CDC, Atlanta, Georgia, USA

⁷National Center for Medical Rehabilitation Research, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, Maryland, USA

Abstract

Background: Women with disability face more stressors around the time of pregnancy than women without disability. Limited research exists on stressors experienced due to the COVID-19 pandemic among pregnant and postpartum women with and without disability.

Objective: Examine the association between disability status and experiencing certain COVID-19 stressors among women with a recent live birth.

Methods: We analyzed Pregnancy Risk Assessment Monitoring System data from 14 jurisdictions implementing the Disability and Maternal COVID-19 Experiences supplement surveys among women with a live birth from June–December 2020. We examined the prevalence of 12 individual stressors and seven stressor types (any stressor, economic, housing, childcare, food insecurity, mental health, and partner-related), by disability status. For each stressor type, we calculated adjusted prevalence ratios (aPRs) using logistic regression to determine if women with disability were more likely to experience particular stressor types, controlling for respondent age, education, race and ethnicity, marital status, and payment at delivery.

Results: Among 5,961 respondents, 6.3% reported a disability. Compared with women without disability, those with disability were more likely to experience any stressor (aPR 1.19, 95% CI 1.14–1.24), including economic (aPR 1.38, 95% CI 1.23–1.56), housing (aPR 1.56, 95% CI 1.09–2.24), childcare (aPR 1.32, 95% CI 1.11–1.58), food insecurity (aPR 2.18, 95% CI 1.72–2.78), mental health (aPR 1.49, 95% CI 1.37–1.62), and partner-related stressors (aPR 2.00, 95% CI 1.55–2.58).

Conclusions: Findings highlight the challenges experienced by pregnant and postpartum women with disability during public health emergencies and considerations for this population in preparedness planning.

Keywords

Disability; COVID-19; PRAMS; Stressors; Pregnancy; Maternal Health

Introduction

Women with disability have been found to experience challenges around the time of pregnancy, including difficulties accessing prenatal and postpartum healthcare services and locating providers knowledgeable about their specific disability.¹ Studies have also shown that compared with women without disability, those with disability have a higher prevalence of experiencing stressful life events in the year before pregnancy,² intimate partner violence (IPV) before and during pregnancy,³ and prenatal and postpartum depressive symptoms.⁴

During the COVID-19 pandemic, the amount of stress experienced among the general population increased.⁵ Individuals with disability experienced more stressors than individuals without disability.^{6–9} Adults with disability were more likely than those without disability to experience financial hardship,^{7,8} food insecurity,^{6,7,9} housing instability, emotional or physical abuse, and poor mental health.⁹ The pandemic also increased stress among pregnant and postpartum women.¹⁰ Recent research found nearly three in four women with a recent live birth experienced at least one economic, housing, childcare, food insecurity, or partner-related stressor due to the pandemic.¹¹ Experiencing any COVID-19 related stressor, regardless of type, was associated with increased anxiety and depressive symptoms.¹¹

Both pregnant women and individuals with disability are considered at increased risk for not being able to access or receive medical care before, during, or after a disaster or public health emergency.¹² The 2019 Pandemic and All-Hazards Preparedness and Advancing Innovation Act requires that the access and functional needs of individuals at increased risk be considered when planning for, responding to, and recovering from a public health emergency.¹²

A better understanding of the stressors experienced during the COVID-19 pandemic among women with a recent live birth and disability can inform future public health emergency planning, response, and recovery, recognizing that both pregnant women and individuals with disability are at increased risk in such emergencies. However, there is a lack of data available on the prevalence of stressors during the COVID-19 pandemic for this population. The Pregnancy Risk Assessment Monitoring System (PRAMS) provides a unique opportunity to examine this intersection among jurisdictions that administered supplements on both disability and COVID-19 maternal experiences to women who delivered a live birth during June – December 2020. This analysis assessed the prevalence of COVID-19 related stressors overall and by disability status and investigated whether women with disability were more likely than those without disability to experience certain types of stressors.

Methods

Data Source

PRAMS is a jurisdiction- and population-based surveillance project of the Centers for Disease Control and Prevention (CDC) and state, local, and territorial health departments. PRAMS collects information on respondent experiences and behaviors before, during, and shortly after pregnancy among women with a recent live birth. Respondents were sampled and contacted 2–6 months postpartum to answer PRAMS questions by mail or phone. PRAMS methodology has been described in detail elsewhere.¹³ The PRAMS protocol, including survey supplements, was approved by the institutional review boards of each participating jurisdiction and CDC.

PRAMS uses supplemental surveys (supplements) to collect data on emerging topics of concern in maternal and child health.¹³ Jurisdictions are able to incorporate supplements at the end of their PRAMS survey. The Disability Supplement^{14,15} was available for use

starting in 2019 and the Maternal COVID-19 Experiences Supplement¹⁶ was available for use starting in late 2020. For our analysis, we utilized PRAMS data from both supplements collected between October 2020 and July 2021, among women with a live birth between June 1, 2020, and December 31, 2020.

Study Population

Our study population included PRAMS respondents from 14 jurisdictions that participated in both the Disability and Maternal COVID-19 Experiences supplements and had a response rate of 50% or above (District of Columbia, Georgia, Louisiana, Maryland, Massachusetts, Michigan, Missouri, Nebraska, North Dakota, Oregon, South Dakota, Tennessee, Vermont, and Virginia). We restricted our analytic sample to respondents with complete information on disability status. Of 6,178 respondents that participated in both supplements, 3.5% (n = 217) had missing information on disability status and were excluded from the final study sample, resulting in a total sample size of 5,961.

Measures

We obtained information on disability status and type from the Disability Supplement.¹⁴ This supplement consisted of the Washington Group Short Set of Questions on Functioning (WG-Short Set).^{17,18} Respondents were asked if at the time of survey completion, they had difficulty: seeing, hearing, walking or climbing stairs, remembering or concentrating, self-care, and communicating. Response options included: “no difficulty,” “some difficulty,” “a lot of difficulty,” and “I cannot do this at all.” We examined the six individual types of disability and classified respondents who answered, “a lot of difficulty” or “I cannot do this at all” as having the respective disability. If respondents had any of the disability types, they were classified as “with” disability, and if they indicated they did not have any of the disability types, they were classified as “without” disability. If a respondent was classified as not having one or more of the individual disability types, but was missing information on the remaining disability types, they were classified as missing for overall disability status and excluded from analyses as their disability status could not be determined. The definition of disability is based on prior literature.^{4,17}

Information on stressors experienced due to the COVID-19 pandemic came from the Maternal COVID-19 Experiences Supplement.¹⁶ Respondents were asked about 12 stressors experienced due to the COVID-19 pandemic (Figure 1). Response options included “yes” and “no.” The 12 stressors were examined three ways in this analysis: individually, by type, and using a stressor score. The seven standardized stressor types were: economic, housing, childcare, food insecurity, mental health (i.e., increased anxiety or depression), partner-related, and any stressor.¹¹ The stressor score was created by summing the stressor types (excluding “any stressor”) and then categorized as none (no stressors), 1–2 stressors, 3–4 stressors, and 5–6 stressors.

We obtained information on respondent demographic characteristics from birth certificate data available in the PRAMS data set. These characteristics were selected *a priori* as potential confounders of the association of disability and stressors based on the literature.^{3,4} These characteristics included: respondent age (≤ 24 ; 25–34; ≥ 35 years); respondent race

and ethnicity (Black, non-Hispanic; Hispanic; other or multiple races, non-Hispanic; White, non-Hispanic); marital status (married; not married); respondent education (less than high school; high school diploma or general equivalency diploma [GED]; more than high school); and payment at delivery (private; Medicaid; other [Indian Health Service, Civil Health and Medical Program of the Uniformed Services (CHAMPUS) or TRICARE, other government (federal, state, or local), or charity]; self-pay). Due to small numbers of respondents with disability for the categories of American Indian or Alaska Native, non-Hispanic; Asian or Pacific Islander, non-Hispanic; or other or multiple races, non-Hispanic (i.e., less than 35 per category), these categories were combined to create the other or multiple races, non-Hispanic category.

Analysis

We calculated weighted prevalence estimates and corresponding 95% confidence intervals (CIs) for any disability overall and disability types. We also examined the weighted prevalence and corresponding 95% CIs of selected respondent demographic characteristics and COVID-19 stressors overall and by disability status. All variables had less than 5% missing (range: 0.0% to 4.1%). For bivariate analyses, missing data were handled using pairwise deletion. Wald chi-squared tests were used to assess differences in respondent demographic characteristics and stressors experienced due to the COVID-19 pandemic between women with disability and women without disability. For significant chi-squared tests with variables including more than two categories, post-hoc comparison tests with a Bonferroni correction were conducted to determine which categories were significantly different from one another among women with disability versus those without disability. A chi-squared p-value of < 0.05 was considered statistically significant for comparing prevalence estimates.

Finally, we examined the associations between disability status and COVID-19 stressor types. Adjusted prevalence ratios (aPRs) and 95% CIs for each stressor type by disability status were calculated using logistic regression with predicted marginals means, which controlled for respondent age, race and ethnicity, education, marital status, and payment at delivery. We restricted our analysis to respondents with complete information on the stressor types, disability status, and respondent demographic characteristics. Data were weighted to adjust for sampling design, noncoverage, and nonresponse, and analyses were performed using SAS-callable SUDAAN 11.0.4 to account for the PRAMS complex sampling design.

Results

Overall, 6.3% of respondents were classified as having disability. The most prevalent type of disability reported was difficulty remembering (3.7%), followed by difficulty seeing (2.0%), difficulty walking or climbing stairs (0.6%), difficulty hearing (0.5%), difficulty communicating (0.5%), and difficulty with self-care (0.4%). Among all respondents, 0.8% reported more than one disability type (Table 1).

Overall, most respondents were 25–34 years old (56.7%), non-Hispanic White (58.4%), married (59.8%), had more than a high school education (62.9%), and had private health insurance at delivery (52.9%). Disability status varied significantly by respondent age ($p =$

0.009), marital status ($p < 0.001$), educational level ($p = 0.001$), and payment at delivery ($p < 0.001$). There were no significant differences in respondent race and ethnicity by disability status ($p = 0.649$) (Table 2).

Among all respondents, 30.1% reported losing their own job or a cut in work hours or pay, 28.4% had a household member that lost their job or pay, 21.3% had problems paying bills, 10.5% had to move, 1.5% became homeless, 23.8% had a loss of childcare or school closures, 35.8% had increased care-taking responsibilities, 30.2% felt more depressed than usual, 52.1% felt more anxious than usual, 18.1% experienced more verbal arguments with their partner than usual, and 2.9% experienced more physical, sexual, or emotional aggression from their partner due to the COVID-19 pandemic (Table 2). Except for respondents experiencing a loss of their own job or pay, a higher proportion of respondents with disability experienced each of the individual stressors than respondents without disability: household member losing their job or pay (46.2% vs. 27.2%, $p < 0.001$), problems paying bills (45.6% vs. 19.7%, $p < 0.001$), having to move (18.1% vs. 10.0%, $p = 0.008$), becoming homeless (4.2% vs. 1.3%, $p = 0.013$), losing childcare or experiencing school closures (35.6% vs. 23.0%, $p = 0.003$), increased care-taking responsibilities (45.3% vs. 35.1%, $p = 0.019$), increased depression (63.3% vs. 27.9%, $p < 0.001$) or anxiety (76.2% vs. 50.5%, $p < 0.001$), and increased verbal arguments with (34.0% vs. 17.0%, $p < 0.001$) or aggression from (11.0% vs. 2.4%, $p = 0.002$) their partner.

Examining the types of stressors, overall, 48.3% of respondents reported experiencing economic stressors, 11.0% housing stressors, 39.6% childcare stressors, 16.0% food insecurity stressors, 54.9% mental health stressors, and 18.6% partner-related stressors (Table 2). A higher proportion of women with disability than women without disability experienced economic (69.4% vs. 46.9%, $p < 0.001$), housing (19.2% vs. 10.4%, $p = 0.005$), childcare (51.2% vs. 38.8%, $p = 0.005$), food insecurity (39.5% vs. 14.5%, $p < 0.001$), mental health (79.1% vs. 53.3%, $p < 0.001$), and partner-related (35.8% vs. 17.4%, $p < 0.001$) stressors.

Twenty percent of all respondents experienced none of the above stressor types, 49.1% experienced 1–2 stressor types, 25.7% experienced 3–4 stressor types, and 5.1% experienced 5–6 stressor types. The prevalence of different stressor scores varied significantly by disability status ($p < 0.001$). A lower proportion of respondents with disability than respondents without disability experienced no stressor types (6.5% vs. 21.0%) (compared to 1–2 stressor types, Bonferroni corrected $p = 0.005$; compared to 3–4 stressor types, Bonferroni corrected $p < 0.001$; compared to 5–6 stressor types, Bonferroni corrected $p < 0.001$). A higher proportion of respondents with disability experienced 3–4 stressor types (37.7% vs. 24.9%) (compared with 1–2 stressor types, Bonferroni corrected $p = 0.009$) or 5–6 stressor types (19.2% vs. 4.2%) (compared with 1–2 stressor types, Bonferroni corrected $p < 0.001$; compared with 3–4 stressor types, Bonferroni corrected $p = 0.004$) than respondents without disability (Table 2).

Finally, examining aPRs for each stressor type by disability status, controlling for respondent age, race and ethnicity, marital status, education, and payment at delivery, respondents with disability had a higher adjusted prevalence of each of the stressor types

compared to respondents without disability: economic (aPR: 1.38 [95% CI: 1.23–1.56]), housing (aPR: 1.56 [95% CI: 1.09–2.24]), childcare (aPR: 1.32 [95% CI: 1.11–1.58]), food insecurity (aPR: 2.18 [95% CI: 1.72–2.78]), mental health (aPR: 1.49 [95% CI: 1.37–1.62]), partner-related (aPR: 2.00 [95% CI: 1.55–2.58]), and any stressor (aPR: 1.19 [95% CI: 1.14–1.24]) (Table 3).

Discussion

Among women with a live birth from June to December 2020 in 14 PRAMS jurisdictions, those with disability had a higher prevalence of COVID-19 related stressors, compared with those without disability. While recent research has demonstrated a higher prevalence of stressors among adults with disability versus those without disability during the pandemic,^{6–9} to our knowledge, our study is among the first to examine these disparities among women with a recent live birth. Our findings build upon previously published analyses of PRAMS Maternal COVID-19 Experiences Supplement data that have documented disparities in COVID-19 related stressors among women with a live birth by race and ethnicity as well as health insurance type at delivery.^{11,19}

Our findings indicated that disability status had the strongest association with food insecurity and partner-related stressors. The prevalence of food insecurity due to the pandemic among women with a recent live birth and disability was more than twice as high as that of those without disability. Previous research has suggested that food insecurity is more prevalent among adults with disability, which may be due to work-limiting conditions that reduce financial resources, functional limitations that make it difficult to buy and prepare food, and cognitive limitations that make it difficult to manage money.²⁰ Several other studies have also shown a higher prevalence of food insecurity/insufficiency among adults with disability versus those without disability during the pandemic, possibly related to difficulty accessing free food resources during the pandemic (e.g., having no transportation to a food program office or pantry, food programs or pantries had reduced hours or fewer food deliveries because of COVID-19).^{6,7,9,21}

We found women with a recent live birth and disability had twice the prevalence of partner-related stressors as compared with those without disability. This finding aligns with prior research indicating that adults with disability were more likely to report household conflict as a source of stress during the COVID-19 pandemic relative to adults without disability.⁹ While our analysis did not look at IPV specifically, past research using 2018–2020 PRAMS data also has demonstrated that women with recent live birth and disability were more likely than those without disability to report physical violence by a partner before and during pregnancy.³ Other research using PRAMS Maternal COVID-19 Experiences Supplement data has also shown that respondents who reported more verbal arguments or conflicts with a husband or partner due to the COVID-19 pandemic had more than six times the prevalence of physical IPV during pregnancy as compared with respondents who did not report this stressor.²²

Our findings for the remaining stressor types were also consistent with the recent literature on disability and stressors experienced during the pandemic.^{7–9} In the current study, women

with a recent live birth and disability had a higher prevalence of housing, mental health, and economic stressors compared with those without disability. Further, we found that women with disability had a higher prevalence of childcare stressors due to the pandemic than those without disability. Limited research has examined differences in childcare stressors related to the pandemic by disability status. For example, one study found that a higher percentage of adults with disability experienced childcare challenges during the COVID-19 pandemic compared with those without disability, but differences were not statistically significant.⁹

Strengths and Limitations

Our study had numerous strengths, including the use of PRAMS data to capture population-based information on women with a recent live birth and disability. The novel analysis using data from two PRAMS supplements—the Maternal COVID-19 Experiences and Disability supplements—provided a sufficient sample size to examine the question of whether disability was related to COVID-19 stressors among women with a recent live birth. This study also had several limitations. We analyzed data from 14 PRAMS jurisdictions that participated in the supplements, which limits the generalizability of our findings to other U.S. jurisdictions. Data collection occurred from October 2020 to July 2021, including women with a live birth between June and December 2020. Stressors experienced due to COVID-19 may have been more pronounced in the beginning of the pandemic compared to the later stages of the pandemic. Likewise, it is unknown whether stressors due to COVID-19 occurred during pregnancy, postpartum, or at both times as both pregnancy and postpartum periods overlapped with the pandemic. Stressors were self-reported, which could result in underestimation due to social desirability bias,²³ especially regarding sensitive topics like partner conflict.

Respondent disability status was based on the WG-Short Set, and results might have varied if disability classification relied on different measures of disability. For instance, the WG-Short Set definition of disability has been found to underestimate the true prevalence of disability, especially for individuals with chronic health conditions or mental illness.^{24,25} Another limitation is the PRAMS Disability Supplement asked about disabilities at the time of survey completion after pregnancy and disability status may therefore have changed for some respondents since their pregnancy. As stressors experienced due to COVID-19 may have occurred during pregnancy, postpartum, or at both times, the temporality of disability status and stressors cannot be determined. Small numbers of unweighted respondents for certain disability types (e.g., difficulty with self-care) prevented the examination of differences in stressors by disability type. Similarly, small numbers of respondents with disability and experiencing particular stressors in each jurisdiction prevented the evaluation of variation in stressors by jurisdiction. Small numbers of respondents with disability who were American Indian or Alaska Native, non-Hispanic; Asian or Pacific Islander, non-Hispanic; or other or multiple races, non-Hispanic prevented the assessment of differences in the prevalence of disability by race and ethnicity using smaller racial and ethnic groups.

For this study, PRAMS had two data collection modes: mail and phone. Consequently, individuals with severe disability may have been underrepresented in the study sample due to being unable to complete the survey as additional accommodations to complete the survey

were not available. We were not able to assess whether there were differences in survey completion by disability status. However, the potential exclusion of individuals with severe disability may have resulted in an underestimation of disparities in stressors experienced due to the COVID-19 pandemic by disability status. Despite these limitations, our findings have implications for understanding the potential impact of the COVID-19 pandemic on pregnant and postpartum women with disabilities.

Implications

Considering the variety of stressors faced by women with a recent live birth and disability during the COVID-19 pandemic, it is important to increase awareness of challenges experienced by this population during public health emergencies and to consider this population during emergency preparedness planning. Given that individuals with disability may be disproportionately impacted during public health emergencies because of significant disruptions to services they depend on, barriers to obtaining resources and benefits may be identified and minimized.²⁶ For example, delivery of free food and programs that provide free or affordable social services may be of benefit to individuals with disability as they are more likely to experience food insufficiency and rely on free sources of foods and meals.^{6,21} Public health programs also can partner with non-governmental organizations with disability experts, such as Centers for Independent Living, to ensure that support services and referrals are available during public health emergencies.²⁷

As women with disabilities may also face unique or increased stressors around the time of pregnancy, screening for social determinants of health, such as food insecurity, exposure to violence, housing instability, and financial stressors, can further be incorporated into the delivery of reproductive healthcare.²⁸ The American College of Obstetricians and Gynecologists recommends that obstetrician–gynecologists and other healthcare providers inquire about and document social determinants of health and maximize referrals to social services to help improve patient-centered care and decrease inequities in healthcare.²⁸ Healthcare providers also can remain aware of increased stressors that pregnant and postpartum women with disability may experience during public health emergencies and ensure mental health screenings are included with all visits and provide mental health service referrals, as needed.²⁹ As women with disability are less likely to receive timely prenatal and postpartum care,³⁰ screening for social determinants of health and referrals to services can also be considered during well-child visits.

To further inform future public health emergency planning, research identifying programs and policies that were protective for pregnant and postpartum women with disabilities during the COVID-19 pandemic is warranted. For example, persons with disabilities were more likely to use economic stimulus payments for immediate basic needs than persons without disabilities during the COVID-19 pandemic.³¹ However, it should be noted that the financial relief programs provided to both the disabled and non-disabled populations during the pandemic, while likely protective to the disability population, were insufficient to eliminate food insecurity stressors. Unless significant systemic changes are made to address the reduced financial resources of the disability population broadly, these types of disparities are likely to reappear in future public health emergencies.

Conclusions

Using a novel analysis of two PRAMS supplements, our study uniquely contributes to the existing literature by examining the association between disability status and stressors experienced due to the COVID-19 pandemic among women with a recent live birth in 14 U.S. jurisdictions. Our findings demonstrated that the prevalence of economic, housing, childcare, food insecurity, mental health, and partner-related COVID-19 stressors were all higher among women with than without disability. Understanding how the COVID-19 pandemic disproportionately impacted women with a recent live birth and disability can help inform future public health emergency planning, response, and recovery.

Acknowledgments:

We thank the PRAMS Working Group, which includes the PRAMS Team, Division of Reproductive Health, CDC, and the following PRAMS sites for their role in conducting PRAMS surveillance and allowing the use of their data: PRAMS District of Columbia, PRAMS Georgia, PRAMS Louisiana, PRAMS Maryland, PRAMS Massachusetts, PRAMS Michigan, PRAMS Missouri, PRAMS Nebraska, PRAMS North Dakota, PRAMS Oregon, PRAMS South Dakota, PRAMS Tennessee, PRAMS Vermont, and PRAMS Virginia. Research reported in this publication was supported in part by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) of the National Institutes of Health under an interagency agreement.

Funding Information:

This research was supported in part by an appointment to the Research Participation Program at the Centers for Disease Control and Prevention (CDC) administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and CDC.

Data Statement:

PRAMS data are available to all interested researchers. Researchers may access PRAMS data by downloading the datasets from the PRAMS Automated Research File (ARF) web portal. Researchers must consent to the PRAMS data sharing agreement to access datasets from the portal. Learn more at <https://www.cdc.gov/prams/php/data-research/>

References

1. Mitra M, Long-Bellil LM, Iezzoni LI, Smeltzer SC, Smith LD. Pregnancy among women with physical disabilities: unmet needs and recommendations on navigating pregnancy. *Disabil Health J.* 2016;9(3):457–463. doi:10.1016/j.dhjo.2015.12.007 [PubMed: 26847669]
2. Booth EJ, Kitsantas P, Min H, Pollack AZ. Stressful life events and postpartum depressive symptoms among women with disabilities. *Women's Health.* 2021;17:1–10. doi:10.1177/17455065211066186
3. Alhusen JL, Lyons G, Laughon K, Hughes RB. Intimate partner violence during the perinatal period by disability status: findings from a United States population-based analysis. *J Adv Nurs.* 2023;79(4):1493–1502. doi:10.1111/jan.15340 [PubMed: 35773949]
4. Alhusen JL, Hughes RB, Lyons G, Laughon K. Depressive symptoms during the perinatal period by disability status: findings from the United States Pregnancy Risk Assessment Monitoring System. *J Adv Nurs.* 2023;79(1):223–233. doi:10.1111/jan.15482 [PubMed: 36320150]
5. Mahmud S, Mohsin M, Nayem DM, Mueyed A. The global prevalence of depression, anxiety, stress, and insomnia among general population during COVID-19 pandemic: a systematic review and meta-analysis. *Trends in Psychol.* 2023;31:143–170. doi:10.1007/s43076-021-00116-9
6. Assi L, Deal JA, Samuel L, Reed NS, Ehrlich JR, Swenor BK. Access to food and health care during the COVID-19 pandemic by disability status in the United States. *Disabil Health J.* 2022;15(3):101271. doi:10.1016/j.dhjo.2022.101271 [PubMed: 35151597]

7. Ciciurkaite G, Marquez-Velarde G, Brown RL. Stressors associated with the COVID-19 pandemic, disability, and mental health: considerations from the Intermountain West. *Stress Health*. 2022;38(2):304–317. doi:10.1002/smi.3091 [PubMed: 34382736]
8. Friedman C Financial hardship experienced by people with disabilities during the COVID-19 pandemic. *Disabil Health J*. 2022;15(4):101359. doi:10.1016/j.dhjo.2022.101359 [PubMed: 35835660]
9. Okoro CA, Strine TW, McKnight-Eily L, Verlenden J, Hollis ND. Indicators of poor mental health and stressors during the COVID-19 pandemic, by disability status: a cross-sectional analysis. *Disabil Health J*. 2021;14(4):101110. doi:10.1016/j.dhjo.2021.101110 [PubMed: 33962896]
10. Kotlar B, Gerson EM, Petrillo S, Langer A, Tiemeier H. The impact of the COVID-19 pandemic on maternal and perinatal health: a scoping review. *Reprod Health*. 2021;18(1):10. doi:10.1186/s12978-021-01070-6 [PubMed: 33461593]
11. Meeker J, Strid P, Simeone R, et al. Pandemic-related stressors and mental health among women with a live birth in 2020. *Arch Womens Ment Health*. 2023;26(6):767–776. doi:10.1007/s00737-023-01364-7 [PubMed: 37608095]
12. U.S. Department of Health & Human Services (USDHHS). At-risk individuals with access and functional needs. Accessed August 5, 2024. https://aspr.hhs.gov/at-risk/Pages/atrisk_afn.aspx
13. Shulman HB, D'Angelo DV, Harrison L, Smith RA, Warner L. The Pregnancy Risk Assessment Monitoring System (PRAMS): overview of design and methodology. *Am J Public Health*. 2018;108(10):1305–1313. doi:10.2105/AJPH.2018.304563 [PubMed: 30138070]
14. Centers for Disease Control and Prevention (CDC). PRAMS Disability Supplement 2019–2020. Accessed February 8, 2024. https://www.cdc.gov/prams/pdf/questionnaire/Disability-Supplement_508.pdf
15. D'Angelo DV, Cernich A, Harrison L, et al. Disability and pregnancy: a cross-federal agency collaboration to collect population-based data about experiences around the time of pregnancy. *J Womens Health*. 2020;29(3):291–296. doi:10.1089/jwh.2020.8309
16. CDC. PRAMS Maternal COVID-19 Experiences Supplement. Accessed February 8, 2024. https://www.cdc.gov/prams/pdf/questionnaire/COVID-19-Experiences-Supplement_508.pdf
17. Madans JH, Loeb ME, Altman BM. Measuring disability and monitoring the UN Convention on the Rights of Persons with Disabilities: the work of the Washington Group on Disability Statistics. *BMC Public Health* 2011;11 Suppl 4:S4. doi: 10.1186/1471-2458-11-S4-S4
18. Svestkova O International classification of functioning, disability and health of World Health Organization (ICF). *Prague Med Rep*. 2008;109(4):268–74.
19. Eliason EL, Agostino J, MacDougall H. Social determinants and perinatal hardships during the COVID-19 pandemic. *J Womens Health*. 2024;33(3):371–378. doi: 10.1089/jwh.2023.0290
20. Heflin CM, Altman CE, Rodriguez LL. Food insecurity and disability in the United States. *Disabil Health J*. 2019;12(2):220–226. doi:10.1016/j.dhjo.2018.09.006 [PubMed: 30322776]
21. Brucker DL, Stott G, Phillips KG. Food sufficiency and the utilization of free food resources for working-age Americans with disabilities during the COVID-19 pandemic. *Disabil Health J*. 2022;15(3):101297. doi:10.1016/j.dhjo.2022.101297 [PubMed: 35339409]
22. D'Angelo DV, Kapaya M, Swedo EA, Basile KC, Agathis NT, Zapata LB, Lee RD, Li Q, Ruvalcaba Y, Meeker JR, Salvesen von Essen B, Clayton HB, Warner L. Physical intimate partner violence and increased partner aggression during pregnancy during the COVID-19 pandemic: Results from the Pregnancy Risk Assessment Monitoring System. *Public Health Rep*. 2024. doi: 10.1177/00333549241278631. Epub ahead of print.
23. Krumpal I Determinants of social desirability bias in sensitive surveys: a literature review. *Quality & Quantity*. 2011;47(4):2025–2047. doi:10.1007/s11135-011-9640-9
24. Hall JP, Kurth NK, Ipsen C, Myers A, Goddard K. Comparing measures of functional difficulty with self-identified disability: implications for health policy. *Health Aff (Millwood)*. 2022;41(10):1433–1441. doi:10.1377/hlthaff.2022.00395 [PubMed: 36190890]
25. Landes SD, Swenor BK, Vaitsakhovich N. Counting disability in the National Health Interview Survey and its consequence: comparing the American Community Survey to the Washington Group disability measures. *Disabil Health J*. 2024;17(2):101553. doi:10.1016/j.dhjo.2023.101553 [PubMed: 37981492]

26. World Health Organization. Disability considerations during the COVID-19 outbreak. Accessed April 22, 2024. <https://www.who.int/publications/i/item/WHO-2019-nCoV-Disability-2020-1>
27. Administration for Community Living. Centers for Independent Living. Accessed April 19, 2024. <https://acl.gov/programs/aging-and-disability-networks/centers-independent-living>
28. Committee on Health Care for Underserved Women. American College of Obstetrics and Gynecologists (ACOG) Committee Opinion No. 729: importance of social determinants of health and cultural awareness in the delivery of reproductive health care. *Obstet Gynecol*. 2018;131(1):e43–e48. doi:10.1097/AOG.0000000000002459 [PubMed: 29266079]
29. ACOG. Addressing health equity during the COVID-19 pandemic. Accessed April 22, 2024. <https://www.acog.org/clinical-information/policy-and-position-statements/position-statements/2020/addressing-health-equity-during-the-covid-19-pandemic>
30. Mitra M, Clements KM, Zhang J, Iezzoni LI, Smeltzer SC, Long-Bellil LM. Maternal characteristics, pregnancy complications, and adverse birth outcomes among women with disabilities. *Med Care*. 2015;53(12):1027–1032. doi:10.1097/MLR.0000000000000427 [PubMed: 26492209]
31. McGarity SV, Morris ZA. People with disabilities and COVID-19 economic impact payments. *Journal of Poverty*. 2022;27(2):185–196. doi: 10.1080/10875549.2022.2080029

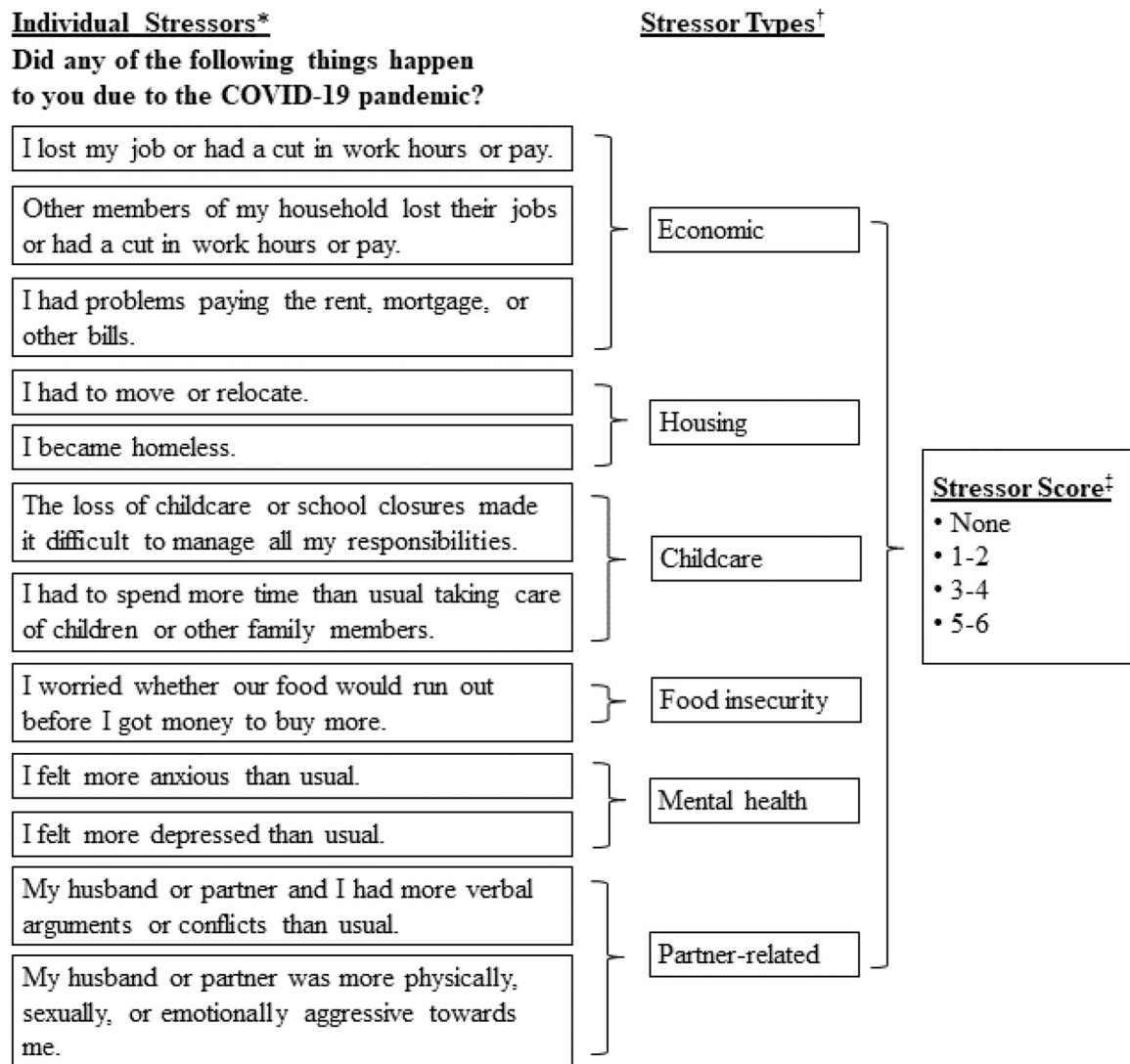


Figure 1.

Measures for stressors experienced due to the COVID-19 pandemic, Maternal COVID-19 Experiences supplement, Pregnancy Risk Assessment Monitoring System (PRAMS), 2020

* Response options included “yes” or “no.”

[†] If a respondent said “yes” to any of the individual stressors in the stressor type, they were classified as experiencing that stressor type. If a respondent answered “no” to all individual stressors in the stressor type, they were classified as not experiencing that stressor type. If a respondent answered “no” to one or more of the individual stressors in the stressor type but were missing information for the remaining stressors in the type, they were coded as missing for that stressor type as whether they experienced that stressor type was unknown.

[‡] Respondents were classified as none (no stressors) if they were classified “no” on all six stressor types. If a respondent was classified “no” for one or more stressor types, but was missing information on the remaining stressor types, they were classified as missing on the stressor score as the number of stressor types they experienced was unknown.

Table 1.

Prevalence of disability and types of disability, Pregnancy Risk Assessment Monitoring System (PRAMS), 2020 *, 14 jurisdictions[†] (n= 5,961[‡])

	Unweighted frequency [§]	% ^{//}	95% CI
Any Disability [¶]	439	6.3	5.4–7.4
Type of Disability			
Difficulty remembering	238	3.7	3.0–4.6
Difficulty seeing	158	2.0	1.6–2.6
Difficulty walking/climbing stairs	44	0.6	0.4–1.1
Difficulty hearing	44	0.5	0.3–0.8
Difficulty communicating	54	0.5	0.3–0.8
Difficulty with self-care	26	0.4	0.2–0.8
More than one disability type	72	0.8	0.6–1.2

CI=confidence interval.

* Data collected among women with live births in June-December 2020.

[†] 14 jurisdictions included the PRAMS Disability and COVID-19 Maternal Experiences supplements and met the required response rate threshold (≥50%) in 2020: District of Columbia, Georgia, Louisiana, Maryland, Massachusetts, Michigan, Missouri, Nebraska, North Dakota, Oregon, South Dakota, Tennessee, Vermont, and Virginia.

[‡] Unweighted sample size.

[§] Unweighted frequency (numerator).

^{//} Weighted prevalence (expressed as a percentage).

[¶] Disability was defined as having “a lot of difficulty” or “cannot do at all” to one or more questions on having difficulty remembering, seeing, hearing, communicating, walking/climbing stairs and/or self-care.

Table 2.
Respondent demographic characteristics and stressors due to the COVID-19 pandemic among women with and without a disability, Pregnancy Risk Assessment Monitoring System (PRAMS), 2020 *, 14 jurisdictions[†] (N=5,961[‡])

	Overall (N=5,961 [‡])			Respondents with a disability [§] (N=439 [‡])			Respondents without a disability [§] (N=5,522 [‡])			chi-squared p-value [#]
	Unweighted frequency	%	95% CI	%	95% CI	%	95% CI			
Respondent demographics characteristics										
Age (years) ^{**}										
≤24	1,191	23.2	21.3–25.2	26.9	20.1–35.1	22.9	21.0–25.0		0.009	
25–34	3,486	56.7	54.5–58.8	60.8	52.6–68.4	56.4	54.2–58.6			
≥35	1,284	20.1	18.5–21.9	12.3	8.2–18.0	20.7	19.0–22.5			
Race and Ethnicity										
Black, Non-Hispanic	1,203	18.0	16.5–19.6	18.7	13.5–25.2	17.9	16.4–19.6		0.649	
Hispanic	1,089	15.7	14.2–17.3	14.3	9.9–20.2	15.8	14.2–17.5			
Other or Multiple, Non-Hispanic ^{††}	1,167	7.9	6.9–9.0	6.1	3.6–10.0	8.0	7.0–9.2			
White, Non-Hispanic	2,474	58.4	56.4–60.4	60.9	53.1–68.2	58.3	56.1–60.3			
Marital Status										
Married	3,571	59.8	57.7–61.9	45.8	37.9–54.0	60.7	58.5–62.9		< 0.001	
Not married		40.2	38.1–42.3	54.2	46.0–62.1	39.3	37.1–41.5			
Education Level ^{‡‡}										
Less than high school	740	11.7	10.3–13.2	18.3	12.1–26.6	11.2	9.8–12.8		0.001	
High school diploma or GED	1,387	25.4	23.5–27.4	34.5	27.4–42.5	24.8	22.8–26.8			
More than high school	3,803	62.9	60.8–65.0	47.2	39.3–55.2	64.0	61.8–66.2			
Payment at Delivery ^{§§}										
Private	3,107	52.9	50.7–55.0	33.5	26.4–41.3	54.2	51.9–56.4		< 0.001	
Medicaid	2,568	42.3	40.2–44.4	61.9	53.9–69.3	41.0	38.8–43.2			
Other ^{¶¶}	107	1.5	1.1–2.1	2.5	0.9–6.7	1.4	1.0–2.0			
Self-pay	151	3.3	2.5–4.4	2.1	0.8–5.8	3.4	2.6–4.5			
Stressor Types										
Economic										

	Overall (N=5,961 [‡])			Respondents with a disability [§] (N=439 [‡])			Respondents without a disability [§] (N=5,522 [‡])			chi-squared p-value [#]
	Unweighted frequency	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Any economic stressor ^{##}	2,804	48.3	46.1–50.5	69.4	61.9–76.1	46.9	44.6–49.1			< 0.001
Respondent lost job or pay	1,701	30.1	28.2–32.2	37.1	29.5–45.3	29.7	27.7–31.8			0.083
Household member lost job or pay	1,634	28.4	26.4–30.4	46.2	38.0–54.6	27.2	25.2–29.2			< 0.001
Problems paying bills	1,291	21.3	19.6–23.2	45.6	37.5–53.9	19.7	17.9–21.5			< 0.001
<i>Housing</i>										
Any housing stressor ^{##}	753	11.0	9.7–12.4	19.2	13.9–25.7	10.4	9.1–11.9			0.005
Had to move	720	10.5	9.3–11.9	18.1	13.0–24.7	10.0	8.7–11.5			0.008
Became homeless	139	1.5	1.1–2.0	4.2	2.5–7.2	1.3	1.0–1.8			0.013
<i>Childcare</i>										
Any childcare stressor ^{##}	2,414	39.6	37.5–41.7	51.2	43.0–59.3	38.8	36.6–41.0			0.005
Loss of childcare or school closures	1,388	23.8	22.0–25.6	35.6	28.1–43.9	23.0	21.2–24.9			0.003
Increased care-taking responsibilities	2,202	35.8	33.7–37.8	45.3	37.3–53.6	35.1	33.0–37.2			0.019
<i>Food insecurity</i>	1,033	16.0	14.5–17.7	39.5	31.8–47.8	14.5	12.9–16.1			< 0.001
<i>Mental health</i>										
Any mental health stressor ^{##}	3,142	54.9	52.7–57.1	79.1	72.8–84.2	53.3	51.0–55.5			< 0.001
Increased depression	1,754	30.2	28.2–32.2	63.3	55.6–70.5	27.9	26.0–30.0			< 0.001
Increased anxiety	2,974	52.1	49.9–54.3	76.2	69.4–81.8	50.5	48.2–52.7			< 0.001
<i>Partner-related</i>										
Any partner-related stressor ^{##}	1,116	18.6	17.0–20.3	35.8	28.2–44.3	17.4	15.8–19.2			< 0.001
Increased verbal arguments with partner	1,086	18.1	16.5–19.8	34.0	26.5–42.3	17.0	15.4–18.7			< 0.001
Increased aggression by partner	192	2.9	2.3–3.7	11.0	6.7–17.4	2.4	1.8–3.2			0.002
<i>Stressor Score^{***}</i>										
No stressors	1,114	20.1	18.4–21.9	6.5	4.1–10.1	21.0	19.2–22.9			< 0.001
1–2 stressors	2,731	49.1	46.9–51.3	36.6	29.1–44.9	50.0	47.7–52.2			
3–4 stressors	1,556	25.7	23.9–27.6	37.7	29.9–46.2	24.9	23.0–26.8			
5–6 stressors	370	5.1	4.3–6.1	19.2	13.6–26.3	4.2	3.4–5.1			

CI=confidence interval; GED=general equivalency diploma.

* Data collected among women with live births during June-December 2020.

[†] 14 jurisdictions included the Disability and COVID-19 Maternal Experiences supplements and met the required response rate threshold ($\geq 50\%$) in 2020: District of Columbia, Georgia, Louisiana, Maryland, Massachusetts, Michigan, Missouri, Nebraska, North Dakota, Oregon, South Dakota, Tennessee, Vermont, and Virginia.

[‡] Unweighted sample size.

[§] Disability was defined as having “a lot of difficulty” or “cannot do at all” to one or more questions on having difficulty remembering, seeing, hearing, communicating, walking/climbing stairs and/or self-care.

^{||} Unweighted frequency (numerator).

[¶] Weighted prevalence (expressed as a percentage).

[#] Wald chi-squared p-value.

^{**} Bonferroni corrected chi-squared analyses indicated a lower proportion of women with disability than those without disability were ≥ 35 years old compared to ≤ 24 years old ($p = 0.049$) and 25–34 years old ($p = 0.017$).

^{††} Due to small numbers for the categories of American Indian or Alaskan Native, non-Hispanic; Asian or Pacific Islander, non-Hispanic; or other or multiple races, non-Hispanic – these categories were collapsed to create the final ‘other or multiple races, non-Hispanic’ category.

^{‡‡} Bonferroni corrected chi-squared analyses indicated a lower proportion of women with disability than those without disability had more than a high school education compared to high school diploma or GED ($p = 0.006$).

^{§§} Bonferroni corrected chi-squared analyses indicated a higher proportion of women with disability than those without disability were Medicaid insured at delivery compared to privately insured at delivery ($p < 0.001$).

^{|||} Medicaid or a comparable state program.

^{¶¶} Includes Indian Health Service; Civil Health and Medical Program of the Uniformed Services (CHAMPUS) or TRICARE; other government (federal, state, or local); or charity.

^{##} Includes “yes” to any individual stressors within specified stressor type.

^{***} Bonferroni corrected chi-squared analyses indicated a lower proportion of women with disability than those without disability experienced no stressor types compared to 1–2 stressor types ($p = 0.005$), 3–4 stressor types ($p < 0.001$), and 5–6 stressor types ($p < 0.001$). A higher proportion of women with disability than those without disability experienced 3–4 stressor types compared to 1–2 stressor types ($p = 0.009$). A higher proportion of women with disability than those without disability experienced 5–6 stressor types compared to 1–2 stressor types ($p < 0.001$) and 3–4 stressor types ($p = 0.004$).

Table 3.

Stressors due to the COVID-19 pandemic: adjusted prevalence ratio estimates for associations with disability status, Pregnancy Risk Assessment Monitoring System (PRAMS), 2020*, 14 jurisdictions[†] (N=5,569[‡])

	Any Economic Stressor		Any Housing Stressor		Any Childcare Stressor		Food Insecurity Stressor		Any Mental Health Stressor		Any Partner-related Stressor		Any Stressor	
	aPR [§]	95% CI	aPR [§]	95% CI	aPR [§]	95% CI	aPR [§]	95% CI	aPR [§]	95% CI	aPR [§]	95% CI	aPR [§]	95% CI
Any disability														
Yes	1.38	1.23–1.56	1.56	1.09–2.24	1.32	1.11–1.58	2.18	1.72–2.78	1.49	1.37–1.62	2.00	1.55–2.58	1.19	1.14–1.24
No	Ref		Ref		Ref		Ref		Ref		Ref		Ref	

aPR = adjusted prevalence ratio; CI = confidence interval; Ref = reference category.

*Data collected among women with live births during June–December 2020.

[†]14 jurisdictions that included the PRAMS Disability and COVID-19 Maternal Experiences supplements and met the required response rate threshold ($\geq 50\%$) in 2020 include: District of Columbia, Georgia, Louisiana, Maryland, Massachusetts, Michigan, Missouri, Nebraska, North Dakota, Oregon, South Dakota, Tennessee, Vermont, and Virginia.

[‡]Unweighted frequency.

[§]Adjusted prevalence ratios adjust for respondent age, respondent race and ethnicity, marital status, respondent education level, and payment at delivery.

^{||}Disability was defined as having “a lot of difficulty” or “cannot do at all” to one or more questions on having difficulty remembering, seeing, hearing, communicating, walking/climbing stairs and/or self-care.