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GYNECOLOGY

Unwanted sexual activity among United States women early in the COVID-19 pandemic

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BACKGROUND: Female sexual activity and, accordingly, birth rates tend to decline in times of stress, such as a pandemic. In addition, when resources are scarce or exogenous conditions are threatening, some women may engage in sexual activity primarily to maintain socioeconomic security. Having unwanted sex may indicate sexual activity in exchange for economic security.

OBJECTIVE: This study aimed to describe patterns and correlates of unwanted sex, defined as having sex more frequently than desired, among US women early in the COVID-19 pandemic.

STUDY DESIGN: The National US Women's Health COVID-19 Study was conducted in April 2020, using a nested quota sample design to enroll 3200 English-speaking women (88% cooperation rate) aged 18 to 90 years recruited from a research panel. The quota strata ensured sufficient sample sizes in sociodemographic groups of interest, namely, racial and ethnic subgroups. Patterns of sexual activity, including unwanted sex early in the pandemic, were described. To further elucidate the experiences of women reporting unwanted sex, open-ended responses to an item querying "how the coronavirus pandemic is affecting your sex life" were assessed using conventional content analysis. Logistic regression analyses—adjusting for sociodemographic characteristics, self-reported health, and prepandemic health-related socioeconomic risk factors, including food insecurity, housing instability, utilities and transportation difficulties, and interpersonal violence—were used to model the odds of unwanted sex by a pandemic-related change in health-related socioeconomic risk factors.

RESULTS: The proportion of women who were sexually active early in the pandemic (51%) was about the same as in the 12 months before the pandemic (52%), although 7% of women became active, and 7% of women became inactive. Overall, 11% of sexually active women were having unwanted sex in the early pandemic. The rates of anxiety, depression, traumatic stress symptoms, and each of the 5 health-related

socioeconomic risk factors assessed were about 2 times higher among women having unwanted sex than other women ($P < .001$). Women having unwanted sex were also 5 times more likely than other women to report an increased frequency of sex since the pandemic (65% vs 13%; $P < .001$) and 6 times more likely to be using emergency contraception (18% vs 3%; $P < .001$). Women reporting unwanted sex commonly described decreased libido or interest in sex related to mood changes since the pandemic, having "more sex," fear or worry about the transmission of the virus because of sex, and having sex to meet the partner's needs. Among sexually active women, the odds of unwanted sex (adjusting for demographic, reproductive, and health factors) were higher among women with 1 prepandemic health-related socioeconomic risk factor (adjusted odds ratio, 2.0; 95% confidence interval, 1.1–3.8) and 2 or more prepandemic health-related socioeconomic risk factors (adjusted odds ratio, 6.0; 95% confidence interval, 3.4–10.6). Among sexually active women with any prepandemic health-related socioeconomic risk factor, those with new or worsening transportation difficulties early in the pandemic were particularly vulnerable to unwanted sex (adjusted odds ratio, 2.7; 95% confidence interval, 1.7–4.3).

CONCLUSION: More than 1 in 10 sexually active US women was having unwanted sex early in the COVID-19 pandemic. Socioeconomically vulnerable women, especially those with new or worsening transportation problems because of the pandemic, were more likely than others to engage in unwanted sex. Pandemic response and recovery efforts should seek to mitigate unwanted sexual activity and related health and social risks among women.

Key words: COVID19, health-related social risks, mental health, sexual activity, social determinants of health, unwanted sex

Introduction

Female sexual activity and, accordingly, birth rates tend to decline in times of exogenous stress.^{1,2} In the acute phase of an infectious disease crisis, when uncertainty is the highest, sexual activity may decline because of infection or concern about infectious risk or

spread.^{3,4} Among people who can become pregnant, sexual activity may be avoided out of uncertainty about or, as in the example of the Zika virus, concern for known deleterious effects on the developing fetus and threat to the pregnant person's health.^{5,6} However, even in these contexts, many women do remain sexually active, with higher rates of sexual activity, pregnancy, and poor birth outcomes seen among women with lower socioeconomic status.^{7–9}

When resources are scarce or exogenous conditions are threatening, some women may engage in sexual activity primarily to maintain socioeconomic security.^{10,11} Sexual activity in exchange

for basic needs or economic security may or may not be overtly coerced.^{12,13} Kern and Peterson,¹⁴ in an empirical examination of unwanted sex, explained that although coerced sex is "probably unwanted," unwanted sex—"sex that an individual does not want or desire to engage in"—may happen without coercion. Individuals may "willingly agree to engage in sex that they do not entirely wish for or desire even though the other person does not employ any coercive tactic." For example, a woman may engage in noncoerced unwanted sex (the partner makes no overt demand for sex) to achieve a positive outcome ("approach motive"), such as money for food, or to

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AJOG at a Glance

Why was this study conducted?

This study aimed to describe patterns and health correlates of unwanted sex among US women early in the COVID-19 pandemic.

Key findings

Overall, 11% of sexually active US women were having unwanted sex early in the COVID-19 pandemic. Socioeconomically vulnerable women were more likely to engage in unwanted sex than other women. The rates of anxiety, depression, and traumatic stress were twice as high, and emergency contraception use was 6 times as high among women having unwanted sex than other women.

What does this add to what is known?

This study characterized unwanted sex in the context of a major public health crisis. Pandemic-related transportation difficulties were newly identified as a significant risk factor for unwanted sex (aOR, 2.7; 95% CI, 1.7-4.3). The strong association between unwanted sex and socioeconomic vulnerability may be an indicator that some women were exchanging sex for basic needs.

avoid a negative outcome (“avoidance motive”), such as a partner leaving her. Unwanted sex—both coerced and non-coerced—can negatively affect women’s health and well-being.^{14–16}

Although women’s sexual activity, including unwanted sex, in the acute phase of a pandemic or other large-scale stressors can have long-term implications for crisis control, response, and recovery, no comprehensive data are available. We deployed the National US Women’s Health COVID-19 Study in April 2020 to capture the immediate effects of the public health crisis on US women, including unwanted sex. In this analysis, we described patterns and health correlates of unwanted sexual activity—defined as having more sex than desired—among US women early in the COVID-19 pandemic and test the hypothesis that rising socioeconomic risk early in the pandemic was associated with higher rates of unwanted sex.

Methods and Materials**Participants and procedures**

The cross-sectional survey was conducted on April 10, 2020, to April 24, 2020. The study was approved by the University of Chicago Institutional Review Board (IRB 20-0489). All participants provided digital documentation of informed consent.

Study design and weighted sample characteristics compared to the general US

population have been previously described.^{17–20} Briefly, English-speaking women aged ≥ 18 years were recruited from the Opinions 4 Good (Op4G) US national research panel using a nested quota sampling strategy. The quota strata ensured sufficient sample sizes to reflect the 2018 US distribution of age and education for adult women and oversampled East and Southeast Asian women.²¹ Using sociodemographic data previously collected from panelists by Op4G, targeted recruitment emails with a 1-time use link for a self-administered, web-based survey were sent. Of 3634 eligible panelists who were successfully contacted, 3200 completed the survey (88% cooperation rate).²² The mean percentage of missing responses was 0.4% (range, 0.0%–2.5%) for all survey items.

Measures

Survey questions and response options used for this analysis are detailed in the Supplemental Table. Women were classified as sexually active or inactive before the pandemic and in the early pandemic based on their frequency of sexual activity. “Partnered” was defined as married or in an unmarried couple or relationship. To enable comparisons of early pandemic to prepandemic sexual activity, women were classified as sexually active before the pandemic if they were active more than once a month in the previous 12 months.

The primary outcome of interest was unwanted sex in the early pandemic. Women responding that they were having sex “much” or “somewhat more often than you would like” were classified as having unwanted sex. Although Kern and Peterson’s 2020 study¹⁴ of unwanted sex identified 3 types of coercive and 2 types of noncoercive unwanted sex, this level of detail was not queried in our survey. However, we did include an open-ended question asking women to “share anything you would like about how the coronavirus pandemic is affecting your sex life.” These qualitative data give some insight into the types of unwanted sex some women experienced. Prepandemic unwanted sex was not assessed.

Health-related socioeconomic risk factors (HRSRs) in the 12 months before the pandemic were assessed using the US Center for Medicare & Medicaid Services Accountable Health Communities 10-item screening tool and categorization instructions.²³ Assessed HRSRs included food insecurity, housing instability, transportation difficulties, utilities difficulties, and interpersonal violence (IPV). A per-individual count of total prepandemic HRSRs was calculated and categorized as 0, 1, or 2 or more. For each HRSR, rising socioeconomic risk in the early pandemic was defined as having a new HRSR (one that was absent before the pandemic but present early in the pandemic) or worsening HRSR (present before the pandemic and reported as worsening early in the pandemic).

Statistical analysis

Survey weights were generated using the raking ratio method, matching the marginal distributions for age group, race, education, income category, and region to the 2018 US population estimates. Of 3200 participants, 24 were excluded because of missing income data. All analyses were weighted.

Of 3176 women, 50 (1.6%) were excluded from analyses of unwanted sex because of missing data. Descriptive statistics for sociodemographic and health characteristics were calculated by unwanted sex status. These factors were compared for women reporting

unwanted sex vs others using bivariate analyses. Pregnancy intention (trying, actively avoiding, or other) and contraceptive use were calculated by unwanted sex status for women who were sexually active and could become pregnant (<55 years old and responded to both pre-pandemic and early pandemic pregnancy intention questions and did not indicate at either time point that they were unable to become pregnant).

Multivariable logistic regression was used to model the odds of unwanted sex among women who were sexually active during the early pandemic, by pre-pandemic HRSR count (0, 1, or 2 or more) and presence or absence of individual pre-pandemic HRSRs. Among sexually active women with at least 1 pre-pandemic HRSR, multivariable logistic regression was used to model the odds of unwanted sex by presence or absence of at least 1 new or worsening risk and, separately, for new and worsening risk for each HRSR. The analyses were adjusted for covariates, including socio-demographic (age, income, education, race and ethnicity, marital status, number of people in household, number of children in household, and geographic region) and health characteristics (number of comorbidities, early pandemic pregnancy intention, and symptoms of depression, anxiety, and traumatic stress). If data for any of the covariates were missing, the data for that participant were not included in the analysis. A statistically driven backward elimination procedure for the selection of model covariates was also considered and produced similar results (data not shown). The results are presented as adjusted odds ratios (aORs) with 95% confidence intervals (CIs). CIs were not adjusted for multiple testing. Analyses were conducted using Stata (version 16.1; StataCorp LLC, College Station, TX).

Inductive conventional content analysis was used to analyze 115 qualitative responses to the open-ended item (described above) from 205 women in the sample who indicated unwanted sex.²⁴ A preliminary codebook was created based on a first-pass read

TABLE 1

Weighted sociodemographic and health characteristics for participants in the US Women's Health COVID-19 Study (April 2020), overall and stratified by status of unwanted sexual activity early in the COVID-19 pandemic

Characteristics	Total	Unwanted sex	Sex about the same or less often than would like
	N=3126 %	n=205 %	n=2921 %
Partner status^a			
Single, never married, divorced, or widowed	38.2	27.8	38.9
Married or in a couple or relationship	61.8	72.2	61.1
Prepandemic sexual activity status^b			
Inactive	48.2	10.2	50.6
Active	51.8	89.8	49.4
Age group (y)^b			
18–44	44.6	71.4	42.9
45–64	33.0	19.2	33.9
≥65	22.4	9.4	23.2
Race^b			
White	73.4	63.9	74.0
Black	12.8	25.0	12.0
East or Southeast Asian	5.8	7.7	5.7
Other	8.0	3.5	8.3
Ethnicity^a			
Hispanic	14.0	21.6	13.5
Non-Hispanic	86.0	78.4	86.5
Education level			
High school or less	37.2	39.4	37.1
More than high school	62.8	60.6	62.9
Household income			
<\$25,000	19.6	19.4	19.6
\$25,000–\$49,000	21.3	22.5	21.2
\$50,000–\$99,000	30.0	28.7	30.1
≥\$100,000	29.1	29.4	29.1
Household size^a			
Only self	15.5	9.8	15.9
Self + 1	34.3	29.8	34.6
Self + >1	50.2	60.4	49.5
Number of children in the household^b			
0 children	61.0	44.2	62.0
1 child	17.6	30.2	16.7

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(continued)

TABLE 1
Weighted sociodemographic and health characteristics for participants in the US Women's Health COVID-19 Study (April 2020), overall and stratified by status of unwanted sexual activity early in the COVID-19 pandemic (continued)

Characteristics	Total	Unwanted sex	Sex about the same or less often than would like
	N=3126 %	n=205 %	n=2921 %
≥2 children	21.5	25.7	21.2
Region ^a			
Midwest	20.7	12.6	21.2
Northeast	17.0	22.4	16.7
South	38.5	42.9	38.2
West	23.8	22.2	23.9
Mental health symptoms			
Anxiety (past 2 wk) ^b	28.6	47.3	27.5
Depression (past 2 wk) ^b	29.5	52.8	28.0
Traumatic stress (since the start of the pandemic) ^b	17.4	29.6	16.6
Prepandemic HRSRs			
0 HRSR	56.2	20.5	58.5
1 HRSR	21.6	19.3	21.8
≥2 HRSRs	22.1	60.1	19.7
Early pandemic HRSRs ^b			
0 HRSR	51.1	22.0	52.9
1 HRSR	27.8	25.6	27.9
≥2 HRSRs	21.2	52.4	19.2

HRSR, health-related social risk.

^a $P < .05$; ^b $P < .001$.

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through of responses and then was reviewed and discussed between 3 coders to generate definitions for each code, with examples. Of note, 2 independent coders assigned primary and secondary codes to all relevant responses. Any discrepant codes were discussed and adjudicated. Interrater reliability (IRR) was calculated for the 2 primary coders, aiming for 95% agreement; IRR before adjudication was 96%.

Results

Characteristics of the study population

Table 1 summarizes the weighted characteristics of the study population.

Overall, 62% of women were partnered, and 52% of women were sexually active before the pandemic. Although the rate of sexual activity was about the same in the early pandemic (51%), 7% of women became active, and 7% of women became inactive (Figure 1). Of note, 6% of all women and 11% of sexually active women were having unwanted sex in the early pandemic. Most women (71%) reporting unwanted sex early in the pandemic were in the 18- to 44-year age group, but nearly 1 in 10 women were 65 years or older. Among women who were sexually active and could become pregnant, 10% were actively trying to conceive before the pandemic. In the

early pandemic, 53% of these women were still actively trying to conceive, and 17% of women were actively trying to avoid pregnancy (Figure 2).

Early pandemic sexual activity and unwanted sex

Of note, 10% of all women reported an increase, and 25% of women reported a decrease in the frequency of sexual activity since the start of the pandemic. Among sexually active women, those having unwanted sex in the early pandemic were 5 times more likely to report an increase in the frequency of sex during the early pandemic (65% vs 13% of other women; $P < .001$).

Mental health, reproductive health, and unwanted sex

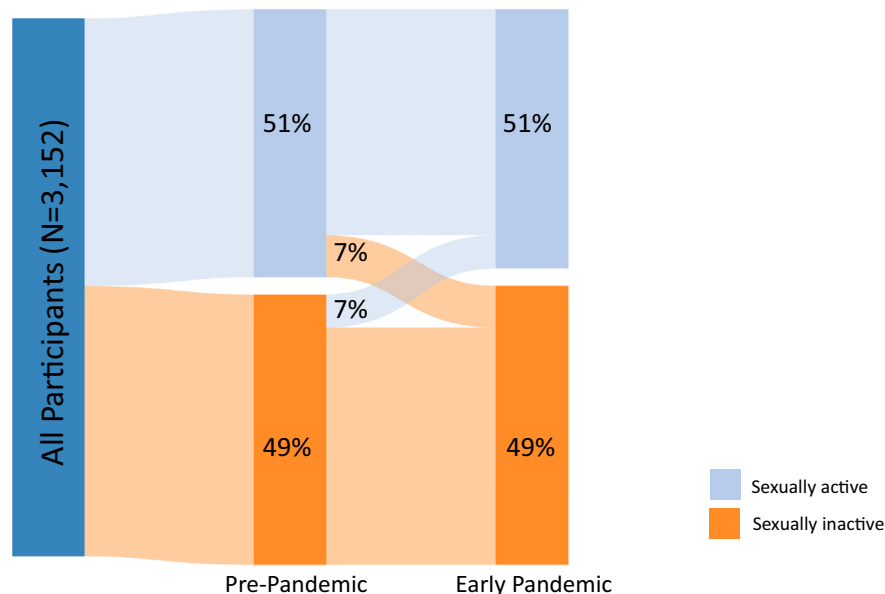
The rates of early pandemic depression, anxiety, or traumatic stress symptoms were 1.5 to nearly 2.0 times higher among women having unwanted sex (Table 1). Women having unwanted sex early in the pandemic were more likely than others to be actively trying to conceive (17% vs 7%; $P < .05$) (Table 2). Contraceptive use was also significantly higher among women having unwanted sex than other women (74% vs 57% were using any contraception in the early pandemic; $P = .001$), including condoms (33% vs 23%; $P < .05$), oral contraceptive pills (36% vs 25%; $P < .05$), and emergency contraception (18% vs 3%; $P < .001$).

Health-related social risk factors, socioeconomic vulnerability, and unwanted sex

Overall, 21% of sexually active women had 1 prepandemic HRSR, and 24% of sexually active women reported 2 or more prepandemic HRSRs (Table 1). The prevalence of multifactor socioeconomic vulnerability (2 or more HRSRs) was 3-fold among women having unwanted sex (60% vs 19% of others; $P < .001$).

Nearly three-quarters (73%) of sexually active women having unwanted sex early in the pandemic were food insecure in the 12 months before the pandemic (vs 34% of others). Women having unwanted sex also had much higher rates of prepandemic lack of reliable transportation

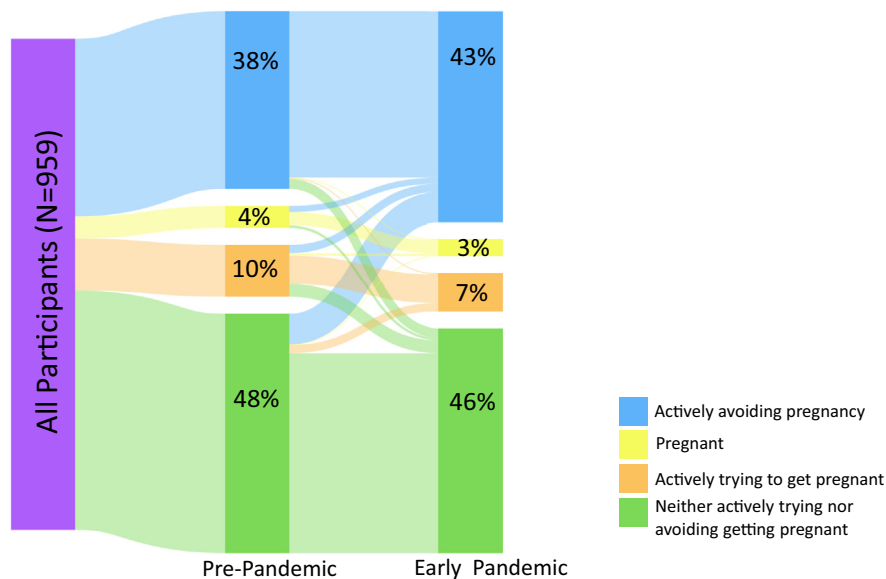
FIGURE 1
Early pandemic change in sexual activity among all women



Percentages may not total 100% because of rounding.

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FIGURE 2
Early pandemic change in pregnancy intention among sexually active women



N=959 includes women <55 years old who responded to both prepandemic and early pandemic pregnancy intention questions and did not indicate at either time point that they were unable to become pregnant. Percentages may not total 100% because of rounding.

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(46% vs 14%), concerns with utilities (36% vs 9%), housing instability (27% vs 9%), and IPV (34% vs 8%) (all $P<.001$). In adjusted analyses, each prepandemic HRSR was significantly associated with 2 to 4 times the odds of unwanted sex early in the pandemic (all $P<.005$) (Figure 3). Compared with women with no prepandemic HRSR, women with 1 prepandemic HRSR had twice the odds of unwanted sex (aOR, 2.0; 95% CI, 1.1–3.8), and those with 2 or more prepandemic HRSRs had 6 times the odds of unwanted sex early in the pandemic (aOR, 6.0; 95% CI, 3.4–10.6) (Figure 3).

The most socioeconomically vulnerable women were those with prepandemic HRSRs who experienced new or worsening HRSRs in the early pandemic. Among the subgroup of sexually active women with at least 1 prepandemic HRSR, those with new or worsening HRSRs had more than twice the odds of unwanted sex in the early pandemic (23% vs 9% of women without incident or worsening HRSRs; $P<.001$; aOR, 2.2; 95% CI, 1.0–4.7) (Figure 4). Among the 5 HRSRs queried, women experiencing new or worsening difficulty with transportation early in the pandemic had significantly higher odds of unwanted sex than other women (aOR, 2.7; 95% CI, 1.7–4.3) (Figure 4).

Ways the pandemic affected the sex life of women having unwanted sex

Women having unwanted sex described decreased interest or libido since the pandemic that they related to mood and mental health symptoms ($n=28$). A 68-year-old Midwest woman wrote: “When I am anxious or worried, it just isn’t anything I have interest in unlike my partner that has the opposite effect.” Other women worried about SARS-CoV-2 transmission during sex: “I really don’t want to have sexual intercourse with anyone at this hard time. Literally probably the best way to get infected” (21 years old, South region) and “I’m scared to engage in sexual activity” (35 years old, Northeast region). Women having unwanted sex also indicated that they were having “more sex” (27 women, only 3 of whom used language indicating some positive

TABLE 2

Pregnancy intention and reproductive health behaviors among sexually active women who were able to get pregnant, overall and stratified by status of unwanted sexual activity early in the COVID-19 pandemic

Variable	Total	Unwanted sex	Sex about the same or less often than would like
	N=954 %	n=130 %	n=824 %
Prepandemic pregnancy intention ^a			
Trying	10.7	17.1	9.8
Actively avoiding	38.2	29.5	39.5
Other	51.1	53.4	50.7
Early pandemic pregnancy intention ^a			
Trying	7.8	17.1	6.5
Actively avoiding	43.6	35.9	44.7
Other	48.6	47.0	48.8
Contraception use (since start of the pandemic)			
None ^a	40.8	26.0	43.0
Any ^b	59.2	74.0	57.0
Condom use ^a	24.3	33.1	23.0
Oral contraceptives ^a	26.0	35.7	24.6
Emergency contraception ^c	5.2	18.0	3.3
Something else	16.2	19.8	15.7

^a $P < .05$; ^b Categories not mutually exclusive. Respondents could indicate all that applied; ^c $P < .001$. Lindau. Unwanted sexual activity and the COVID-19 pandemic. *Am J Obstet Gynecol* 2022.

emotional valence) and some reported “increased intimacy or quality of sex” ($n=22$). Of note, 5 women wrote that they were having unwanted sex mainly to meet a partner’s needs, for example, “I wouldn’t have sex at all but my husband wants to” (76 years old, Midwest region) and “I would have sex rarely but now that my significant other is home more than he wants to be intimate more and that is not to my liking [sic]” (59 years old, West region). Furthermore, 1 woman (19 years old, South region), who did not indicate having unwanted sex, shared that the pandemic forced her to live in the same home as a family member who was sexually assaulting her.

Comment

Principal findings

This study examined unwanted sexual activity among US women concern

ing socioeconomic vulnerability and women’s sexual activity early in the COVID-19 pandemic when morbidity and mortality risks were the highest. More than 1 in 10 sexually active US women were having unwanted sex early in the pandemic; nearly 1 in 10 of all women having unwanted sex were ≥ 65 years old. As hypothesized, we found a significant relationship between unwanted sex and both prepandemic and early pandemic health-related socioeconomic vulnerabilities among women (all $P < .001$). Nearly a quarter of women with socioeconomic vulnerability were having unwanted sex. Unwanted sex was also significantly associated with an elevated risk of depression, anxiety, and traumatic stress symptoms in the early pandemic (all $P < .001$). Early in the COVID-19 pandemic, women having unwanted sex were significantly more

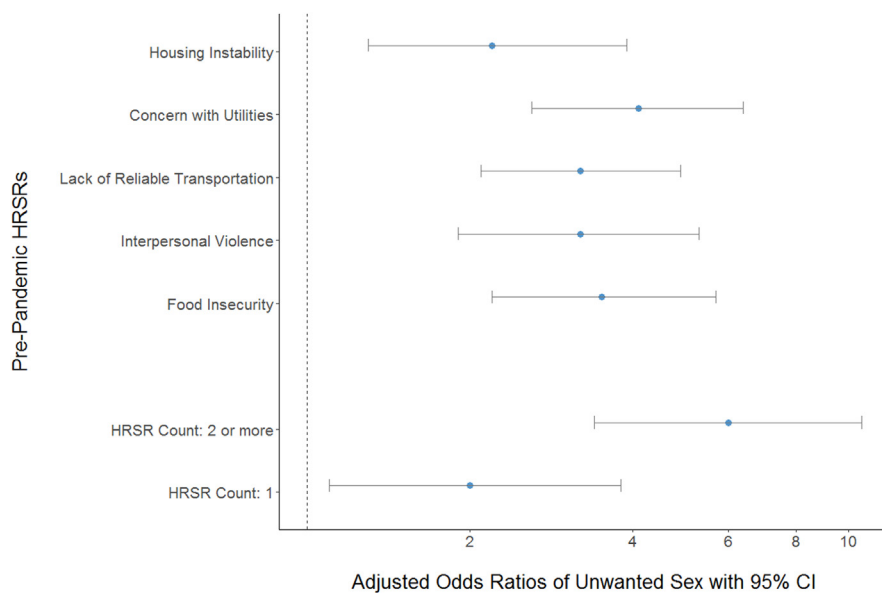
likely than others to report an increase in the frequency of sex ($P < .001$) and to be using any contraception ($P = .0014$) and were 6-fold more likely to use emergency contraception, specifically ($P < .001$).

Results in the context of what is known

Although this study contributes new knowledge about sexual activity, including unwanted sex, in the first weeks of the COVID-19 pandemic, several findings were corroborated by related studies. First, consistent with previous studies, unwanted sex, which may have included cases of noncoerced and coerced sex, was associated with a higher risk of negative psychological sequelae and rising socioeconomic vulnerability.^{10,14–16} Consistent with these findings, food insecurity among women and girls in the United States has been associated with sexual activity in exchange for food or money.^{25,26} Violence against women has also been associated with unwanted sex and has been shown to increase during public health emergencies.^{27–30}

Of note, 1 US study from the University of Minnesota surveyed a convenience sample of 1051 men and women in October 2020 using the MTurk crowdsourcing program to query changes in sexual behavior. The proportion of participants reporting an increase (13%) and the proportion of participants reporting a decrease (27%) in the frequency of partnered sex in that study were on par with the early pandemic changes found in our cohort.³¹ Small, early COVID-19 pandemic studies based on social media or other convenience samples in the United States, Italy, and China also found a decreased frequency of sexual activity and pregnancy intention rates.^{32–35} Overall, although sexual activity rates were relatively stable in the early pandemic, the proportion of women actively attempting to conceive decreased by 30%. This decrease in the proportion of US women actively trying to conceive a pregnancy in April 2020 is consistent with the historic low in US birth rates observed in the first quarter of 2021.³⁶

FIGURE 3
Early pandemic odds of unwanted sex by prepandemic HRSRs



Includes sexually active women. Adjusted odds calculated in reference to no HRSRs. All analyses were adjusted for partner status, race, ethnicity, age, education level, household income, region, number of people in the household, number of children in the household, comorbid conditions, early pandemic pregnancy intention, anxiety, depression, and traumatic stress symptoms.

CI, confidence interval; HRSR, health-related social risk.

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Consistent with previous studies of unwanted sex,^{14,37} qualitative findings from our study suggested that not all women reporting unwanted sex were having coerced sex or negative sexual encounters. Approximately 20% of women reporting unwanted sex were actively attempting to conceive a pregnancy, likely an example of noncoerced unwanted sex. However, the much higher frequency of sexual activity among women having unwanted sex and comparatively high rates of emergency contraceptive use, food insecurity, IPV, and other socioeconomic risks point to the possibility that some unwanted sexual activity in the early pandemic may have been coerced. Consensual unwanted sex to secure or prevent loss of resources to meet basic needs fits with Kern and Peterson's "noncoerced with avoidance motives" typology of unwanted sex. Although not explicitly addressed in their empirical framework, it is important to note that sexual coercion may be overtly exerted by a partner

(eg, through physical force or threats) or could result from structural or interpersonal power and resource differentials.^{13,38} The principles of medical ethics specify coercion as a factor that compromises individual autonomy and, therefore, capacity for consent.³⁹

The very high prevalence of emergency contraception use among women having unwanted sex in the early pandemic warrants deeper investigation and may shed additional light on the meaning of having more sex than one wants. Here, the overall weighted estimate of emergency contraception use in the early pandemic (5%) was within the range of 12-month use estimates (4%) from the population-based National Survey of Family Growth (2017–2019).⁴⁰ For women having unwanted sex early in the pandemic, the rate was 6-fold higher than other women. Although we found no other pandemic study on self-reported emergency contraception use, 2 surveys—one of 1063 US physicians (fall 2020) and

another of 22 pharmacists in California—suggested that interest in and need for emergency contraception may have increased in some populations.^{41,42} Pre-pandemic studies identify unprotected sex, fear that one's regular contraceptive method would not work, and intimate partner violence as positive correlates of emergency contraceptive use.^{43–45} Especially given the strong association with rising socioeconomic vulnerability, the very high rate of emergency contraception use among women having unwanted sex early in the pandemic could reflect barriers to access to other contraceptive methods, including abortion.

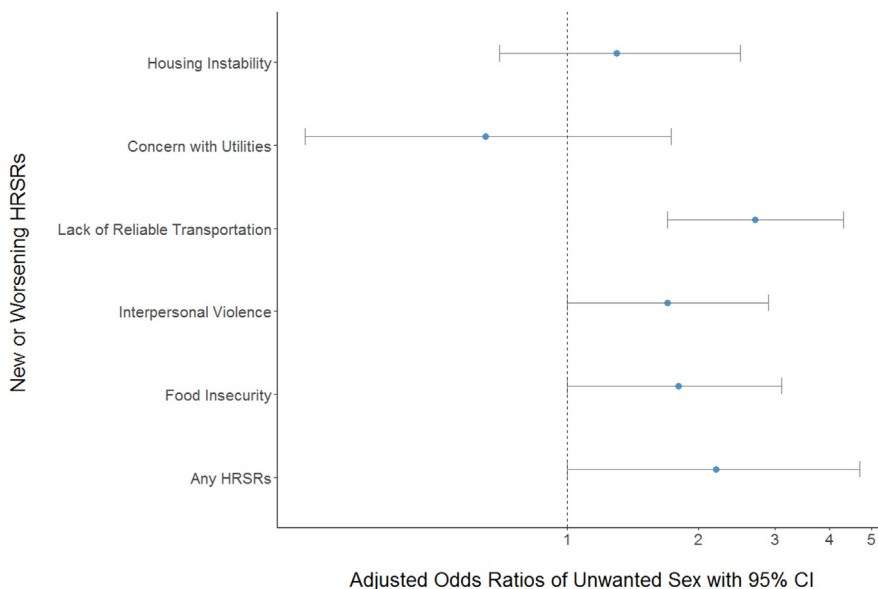
Clinical implications

This study found that socioeconomic vulnerability among women was associated with higher rates of unwanted sexual activity early in the COVID-19 pandemic, independent of pregnancy intention, health, and other sociodemographic factors. The COVID-19 pandemic response and recovery efforts and future public health and other large-scale crises should be informed by the putative health risks associated with unwanted sexual activity among women, including serious mental health symptoms, unplanned or undesired pregnancy, sexual assault, elder abuse, and sexually transmitted infections. Although early evidence suggests that coinfection of SARS-CoV-2 with HIV or chronic hepatitis does not contribute to increased mortality, little is known about the effects of coinfection with the most prevalent sexually transmitted infections seen among women.⁴⁶ All of these conditions, including associated mental health symptoms, create demand for pandemic-strained and scarce medical, public health, and social services resources.

Research implications

The act of participating in or transacting with unwanted sex—even if not overtly coercive—for food or other basic human needs, such as shelter, transportation, or safety raises serious humanitarian, legal, ethical, medical, and public health concerns. During the COVID-19 pandemic, unwanted sexual activity related to rising socioeconomic vulnerability among US

FIGURE 4
Early pandemic odds of unwanted sex by new or worsening HRSRs



Includes sexually active women. Adjusted odds calculated in reference to no new or worsening HRSRs. All analyses were adjusted for partner status, race, ethnicity, age, education level, household income, region, number of people in the household, number of children in the household, comorbid conditions, early pandemic pregnancy intention, anxiety, depression, and traumatic stress symptoms.

CI, confidence interval; HRSR, health-related social risk.

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women could plausibly contribute to the spread of the lethal virus and rising rates of psychiatric symptoms among already vulnerable individuals and communities.¹⁷ Further research on the effects of a major public health crisis on human sexual behavior is warranted. Unwanted sex among older women during the COVID-19 pandemic is a previously undocumented condition that should be understood further in the context of elder abuse prevention and intervention.

Strengths and limitations

The strengths of this study included the large, diverse, national sample; the use of validated and policy-relevant measures of socioeconomic vulnerability and other socioeconomic and health characteristics that harmonize with other COVID-19 studies; and the focus on unwanted sex, an unexamined potential secondary health effect of the COVID-19 pandemic. The findings should be interpreted in light of some limitations.

As is the case for most women's health researchers, we did not have ready access in April 2020 to a probability sample of the US population; even with sampling weights, it is possible that some estimates may not be fully generalizable. However, previously published estimates from this sample in other domains (eg, anxiety, depression, and food insecurity rates) are on par with estimates generated from probability samples.^{17,47–49} In addition, because of budget and time constraints, the survey was only conducted in English, limiting generalizability to non-English-speaking populations, and was cross-sectional, limiting causal inferences. Lastly, the theoretical conceptualization of unwanted sex identifies both coerced and noncoerced types.^{14,37} Qualitative findings provided some insight into the types of unwanted sex experienced by women in our sample, but data were limited. Furthermore, estimates of unwanted sex over a short period early in the pandemic may not be

indicative of unwanted sex over the full course of the crisis.

Conclusions

Clinicians and public health professionals should be aware of unwanted sex as an overlooked factor that may contribute to the spread and secondary health risks of the SARS-CoV-2 virus, especially among socioeconomically vulnerable women. ■

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References

1. Bodenmann G, Atkins DC, Schär M, Poffet V. The association between daily stress and sexual activity. *J Fam Psychol* 2010;24:271–9.
2. Ullah MA, Moin AT, Araf Y, Bhuiyan AR, Griffiths MD, Gozal D. Potential effects of the COVID-19 pandemic on future birth rate. *Front Public Health* 2020;8:578438.
3. Bowling J, Montanaro E, Gattuso J, Gioia D, Guerrero Ordóñez S. "Everything feels risky now": perceived "risky" sexual behavior during COVID-19 pandemic. *J Health Psychol* 2022;27:1498–506.
4. Tenkorang EY. Sexual behaviours in the context of the Ebola virus disease (EVD) in Ghana. *Cult Health Sex* 2018;20:746–60.
5. Chibueze EC, Tirado V, Lopes KD, et al. Zika virus infection in pregnancy: a systematic review of disease course and complications. *Reprod Health* 2017;14:28.
6. Marteleto LJ, Weitzman A, Coutinho RZ, Alves SV. Women's reproductive intentions and behaviors during the Zika epidemic in Brazil. *Popul Dev Rev* 2017;43:199–227.
7. Fahs B, Swank E. Social identities as predictors of women's sexual satisfaction and sexual activity. *Arch Sex Behav* 2011;40:903–14.
8. Dye JL. Fertility of American women: 2008. United States Census Bureau. 2010. Available at: <https://www.census.gov/prod/2010pubs/p20-563.pdf>. Accessed March 4, 2021.
9. Blumenshine P, Egerter S, Barclay CJ, Cubbin C, Braveman PA. Socioeconomic disparities in adverse birth outcomes: a systematic review. *Am J Prev Med* 2010;39:263–72.
10. Dunkle KL, Wingood GM, Camp CM, DiClemente RJ. Economically motivated relationships and transactional sex among unmarried African American and White women:

- results from a U.S. National telephone survey. *Public Health Rep* 2010;125(Suppl4):90–100.
11. Luetke M, Judge A, Kianersi S, Jules R, Rosenberg M. Hurricane impact associated with transactional sex and moderated, but not mediated, by economic factors in Okay, Haiti. *Soc Sci Med* 2020;261:113189.
 12. Kyegombe N, Meiksin R, Wamoyi J, Heise L, Stoebenau K, Buller AM. Sexual health of adolescent girls and young women in Central Uganda: exploring perceived coercive aspects of transactional sex. *Sex Reprod Health Matters* 2020;28:1700770.
 13. Tyler KA, Johnson KA. Trading sex: voluntary or coerced? The experiences of homeless youth. *J Sex Res* 2006;43:208–16.
 14. Kern SG, Peterson ZD. From freewill to force: examining types of coercion and psychological outcomes in unwanted Sex. *J Sex Res* 2020;57:570–84.
 15. Stahlman S, Javanbakht M, Cochran S, Hamilton AB, Shoptaw S, Gorbach PM. Mental health and substance use factors associated with unwanted sexual contact among U.S. active duty service women. *J Trauma Stress* 2015;28:167–73.
 16. Flack WF Jr, Daubman KA, Caron ML, et al. Risk factors and consequences of unwanted sex among university students: hooking up, alcohol, and stress response. *J Interpers Violence* 2007;22:139–57.
 17. Lindau ST, Makelarski JA, Boyd K, et al. Change in health-related socioeconomic risk factors and mental health during the early phase of the COVID-19 pandemic: a national survey of U.S. women. *J Womens Health (Larchmt)* 2021;30:502–13.
 18. Vu M, Makelarski JA, Winslow VA, et al. Racial and ethnic disparities in health-related socioeconomic risks during the early COVID-19 pandemic: a national survey of U.S. women. *J Womens Health (Larchmt)* 2021;30:1375–85.
 19. Guillaume JD, Jagai JS, Makelarski JA, et al. COVID-19-Related food insecurity among households with dietary restrictions: a national survey. *J Allergy Clin Immunol Pract* 2021;9:3323–30.e3.
 20. Kumar S, Lee NK, Pinkerton E, Wroblewski KE, Lengyel E, Tobin M. Resilience: a mediator of the negative effects of pandemic-related stress on women's mental health in the USA. *Arch Womens Ment Health* 2022;25:137–46.
 21. United States Census Bureau. American Community survey 1-year estimates. 2018. Available at: https://www2.census.gov/programs-surveys/acs/summary_file/2018/data/?#. Accessed May 15, 2020.
 22. The American Association for Public Opinion Research. Standard definitions: final dispositions of case codes and outcome rates for surveys, 9th ed. Alexandria, VA: American Association for Public Opinion Research; 2016.
 23. Billioux A, Verlander K, Anthony S, Alley DE. Standardized screening for health-related social needs in clinical settings: the accountable health communities screening tool. National Academy of Medicine. 2017. Available at: <https://nam.edu/wp-content/uploads/2017/05/Standardized-Screening-for-Health-Related-Social-Needs-in-Clinical-Settings.pdf>. Accessed February 8, 2022.
 24. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res* 2005;15:1277–88.
 25. Stoner MCD, Haley DF, Golin CE, Adimora AA, Pettifor A. The relationship between economic deprivation, housing instability and transactional sex among women in North Carolina (HPTN 064). *AIDS Behav* 2019;23:2946–55.
 26. Justman J, Befus M, Hughes J, et al. Sexual behaviors of US women at risk of HIV acquisition: a longitudinal analysis of findings from HPTN 064. *AIDS Behav* 2015;19:1327–37.
 27. Parkinson D. Investigating the increase in domestic violence post disaster: an Australian case study. *J Interpers Violence* 2019;34:2333–62.
 28. Harville EW, Taylor CA, Tesfai H, Xiong Xu, Buekens P. Experience of Hurricane Katrina and reported intimate partner violence. *J Interpers Violence* 2011;26:833–45.
 29. Doctors of the World, Oxfam. Dominican Republic gender analysis: a study of the impact of the Zika virus on women, girls, boys and men. 2017. Available at: <https://oxfamlibrary.openrepository.com/bitstream/handle/10546/620261/rr-dominican-republic-gender-analysis-210417-en.pdf?sequence=1&isAllowed=y>. Accessed September 30, 2020.
 30. Onyango MA, Resnick K, Davis A, Shah RR. Gender-based violence among adolescent girls and young women: a neglected consequence of the West African Ebola outbreak. In: Schwartz DA, Anoko JN, Abramowitz SA, eds. *Pregnant in the time of Ebola: women and their children in the 2013–2015 West African epidemic*. Global Maternal and Child Health. Springer International Publishing; 2019. p. 121–32. Available at: https://link.springer.com/chapter/10.1007/978-3-319-97637-2_8. Accessed September 29, 2020.
 31. Gleason N, Banik S, Braverman J, Coleman E. The impact of the COVID-19 pandemic on sexual behaviors: findings from a national survey in the United States. *J Sex Med* 2021;18:1851–62.
 32. Lin TK, Law R, Beaman J, Foster DG. The impact of the COVID-19 pandemic on economic security and pregnancy intentions among people at risk of pregnancy. *Contraception* 2021;103:380–5.
 33. Micelli E, Cito G, Cocci A, et al. Desire for parenthood at the time of COVID-19 pandemic: an insight into the Italian situation. *J Psychosom Obstet Gynaecol* 2020;41:183–90.
 34. Cito G, Micelli E, Cocci A, et al. The impact of the COVID-19 quarantine on sexual life in Italy. *Urology* 2021;147:37–42.
 35. Li W, Li G, Xin C, Wang Y, Yang S. Changes in sexual behaviors of young women and men during the coronavirus disease 2019 outbreak: a convenience sample from the epidemic area. *J Sex Med* 2020;17:1225–8.
 36. Driscoll A, Osterman M, Hamilton B, Valenzuela C, Martin J. Quarterly provisional estimates for selected birth indicators, Quarter 1, 2019-quarter 2, 2021. National Center for Health Statistics. National vital statistics system. Vital Press Statistics Rapid Release Program; 2021. Available at: <https://www.cdc.gov/nchs/nvss/vsrr/nativity-dashboard.htm>. GFR that quarter was 55.0, down from 2020's national record low of 56.0. Official NVSS report on 2021 births hasn't yet been released, but 2020 report is also available to corroborate: <https://www.cdc.gov/nchs/data/nvsr/nvsr70/nvsr70-17.pdf>. Accessed December 10, 2021.
 37. Peterson ZD, Muehlenhard CL. Conceptualizing the “wantedness” of women's consensual and nonconsensual sexual experiences: implications for how women label their experiences with rape. *J Sex Res* 2007;44:72–88.
 38. Kamndaya M, Kazembe LN, Vearey J, Kabiru CW, Thomas L. Material deprivation and unemployment affect coercive sex among young people in the urban slums of Blantyre, Malawi: a multi-level approach. *Health Place* 2015;33:90–100.
 39. Sexual misconduct in the practice of medicine. Council on Ethical and Judicial Affairs, American Medical Association. *JAMA* 1991;266:2741–5.
 40. Centers for Disease Control and Prevention, National Center for Health Statistics. 2017–2019 National Survey of Family Growth: Public-Use Data Files, Codebooks, and Documentation. 2020. Available at: https://www.cdc.gov/nchs/nsfg/nsfg_2017_2019_puf.htm. Accessed February 8, 2022.
 41. Siddiqui N, Rafie S, Tall Bull S, Mody SK. Access to contraception in pharmacies during the COVID-19 pandemic. *J Am Pharm Assoc (2003)* 2021;61:e65–70.
 42. Zapata LB, Curtis KM, Steiner RJ, et al. COVID-19 and family planning service delivery: findings from a survey of U.S. physicians. *Prev Med* 2021;150:106664.
 43. Hussain R, Kavanaugh ML. Changes in use of emergency contraceptive pills in the United States from 2008 to 2015. *Contracept X* 2021;3:100065.
 44. Daniels K, Jones J, Abma J. Use of emergency contraception among women aged 15–44: United States, 2006–2010. *NCHS Data Brief* 2013;112:1–8.
 45. Gee RE, Mitra N, Wan F, Chavkin DE, Long JA. Power over parity: intimate partner violence and issues of fertility control. *Am J Obstet Gynecol* 2009;201:148.e1–7.
 46. Sarkar S, Khanna P, Singh AK. Impact of COVID-19 in patients with concurrent co-infections: a systematic review and meta-analyses. *J Med Virol* 2021;93:2385–95.
 47. Cai C, Woolhandler S, Himmelstein DU, Gaffney A. Trends in anxiety and depression symptoms during the COVID-19 pandemic: results from the US Census Bureau's household pulse survey. *J Gen Intern Med* 2021;36:1841–3.
 48. Ettman CK, Abdalla SM, Cohen GH, Sampson L, Vivier PM, Galea S. Prevalence of

depression symptoms in US adults before and during the COVID-19 pandemic. *JAMA Netw Open* 2020;3:e2019686.

49. Morales DX, Morales SA, Beltran TF. Racial/ethnic disparities in household food insecurity during the COVID-19 pandemic: a nationally representative study. *J Racial Ethn Health Disparities* 2021;8:1300–14.

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The data underlying this article will be shared on reasonable request to the corresponding author.

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SUPPLEMENTAL TABLE 1

Survey Questions Used from the National Women's Health COVID-19 Study

Question	Answer	Source
What race do you consider yourself to be? Please select one or more.	1, White	1
	2, Black or African American	
	3, American Indian or Alaskan Native	
	4, Asian Indian	
	5, Chinese	
	6, Filipino	
	7, Japanese	
	8, Korean	
	9, Vietnamese	
	10, Other Asian	
	11, Pacific Islander	
	12, Other	
Do you consider yourself to be Hispanic, Latino/a/x or of Spanish origin?	0, No	2
	1, Yes	
What is your age in years?	—	1
In 2019, was your annual household income from all sources...	1, Less than \$25,000	Modified ¹
	2, Between \$25,001 and \$50,000	
	3, Between \$50,001 and \$100,000	
	4, More than \$100,000	
	77, Don't know	
	99, Refuse	
What is the highest grade or year of school you completed?	1 Never attended school or only attended kindergarten	1
	2 Grades 1 through 8 (Elementary)	
	3 Grades 9 through 11 (Some high school)	
	4 Grade 12 or GED (High school graduate)	
	5 College 1 year to 3 years (Some college or technical school)	
	6 College 4 years or more (College graduate)	
Are you currently...	1, Married	1
	2, Divorced / separated	
	3, Widowed	
	4, In an unmarried couple/relationship	
	5, Single / never married	
How many people live in your household, including you?	—	Modified ¹

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(continued)

SUPPLEMENTAL TABLE 1

Survey Questions Used from the National Women's Health COVID-19 Study

(continued)

Question	Answer	Source
How many children less than 18 years of age live in your household?	—	1
In general, would you say your health is:	1, Excellent 2, Very good 3, Good 4, Fair 5, Poor	3
Since the start of the coronavirus pandemic, have you been bothered by feeling very upset when someone reminds you of the pandemic?	1, Not at all 2, A little 3, Somewhat 4, Quite a bit 5, Extremely	4
Since the start of the coronavirus pandemic, have you had repeated disturbing memories, thoughts, or dreams about the pandemic?	1, Not at all 2, A little 3, Somewhat 4, Quite a bit 5, Extremely	4
Over the last 2 weeks, how often have you been bothered by the following problems? - Feeling nervous, anxious, or on edge - Not being able to stop or control worrying - Worrying too much about different things - Trouble relaxing - Being so restless that it's hard to sit still - Becoming easily annoyed or irritable - Feeling afraid as if something awful might happen	0, Not at all 1, Several days 2, Over half the days 3, Every day	5
Over the last 2 weeks, how often have you been bothered by the following problems? - Little interest or pleasure in doing things - Feeling down, depressed, or hopeless	0, Not at all 1, Several days 2, Over half the days 3, Every day	6
We would like to ask you some questions about your sexual relationships. By "sex" or "sexual activity," we mean any mutually voluntary activity with another person that involves sexual contact, whether or not intercourse or orgasm occurs.		

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(continued)

SUPPLEMENTAL TABLE 1

Survey Questions Used from the National Women's Health COVID-19 Study

(continued)

Question	Answer	Source
In the 12 months before the coronavirus pandemic, how often did you have sex with another person?	1, Once a day	Novel
	2, A few times a week	
	3, Once a week	
	4, A few times a month	
	5, Once a month or less	
	6, Not at all	
	77, Don't know	
	99, Refuse	
Since the start of the coronavirus pandemic, how many times have you had sex with another person?	1, Once a day	Novel
	2, A few times a week	
	3, Once a week	
	4, Less than once a week	
	5, Not at all	
	77, Don't know	
	99, Refuse	
Thinking about how often you have had sex with another person since the start of the coronavirus pandemic, has it been...	1, Much more often	Novel
	2, Somewhat more often	
	3, About the same	
	4, Somewhat less often	
	5, Much less often	
	77, Don't know	
	99, Refuse	
Since the coronavirus pandemic, would you say that you had sex with another person...	1, Much more often than you would like	Novel
	2, Somewhat more often than you would like	
	3, About the same as you would like	
	4, Somewhat less often than you would like	
	5, Much less often than you would like	
Tell us about how the coronavirus pandemic is affecting your sex life.	_____	Novel
We'd like to know about specific types of contraception you use. Select all methods you've used in the 12 months before the coronavirus pandemic.	1, Condoms	Modified ⁷
	2, Birth control pills (oral contraceptives)	
	3, Emergency contraception	
	4, Something else	
	5, I have not used contraception in the past 12 months	

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(continued)

SUPPLEMENTAL TABLE 1

Survey Questions Used from the National Women's Health COVID-19 Study

(continued)

Question	Answer	Source
Select all methods you've used since the start of the coronavirus pandemic.	1, Condoms	Modified ⁷
	2, Birth control pills (oral contraceptives)	
	3, Emergency contraception	
	4, Something else	
	5, I have not used contraception in the past 12 months	
Since the start of the coronavirus pandemic, did you have to stop taking birth control pills?	1, Yes	
	2, No	
	77, Don't know	
	99, Refuse	
In the 3 months before the start of the coronavirus pandemic, which one of these statements about pregnancy best describes you?	1, I was trying to get pregnant	Modified ⁷
	2, I was neither trying to get pregnant nor trying to avoid getting pregnant	
	3, I was trying to avoid getting pregnant	
	4, I was pregnant	
	5, Other (e.g., not able to get pregnant, not engaging in sexual activity that could cause pregnancy, etc.)	
Which one of these statements about pregnancy best describes you now?	1, I am trying to get pregnant	Modified ⁷
	2, I am neither trying to get pregnant nor trying to avoid getting pregnant	
	3, I am trying to avoid getting pregnant	
	4, I am pregnant	
	5, Other (e.g., not able to get pregnant, not engaging in sexual activity that could cause pregnancy, etc.)	
Some people have made the following statements about their food situation. Please answer whether the statements were often, sometimes, or never true for you and your household in the 12 months before the coronavirus pandemic.		
In the 12 months before the coronavirus pandemic, you worried that your food would run out before you got money to buy more.	1, Often true	Modified ⁸
	2, Sometimes true	
	3, Never true	
How has your worry about food running out before you got money to buy more changed since the start of the coronavirus pandemic?	1, A lot more worried	Novel
	2, Somewhat more worried	
	3, No change	
	4, Somewhat less worried	
	5, A lot less worried,	
	77, Don't know	
	99, Refuse	

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(continued)

SUPPLEMENTAL TABLE 1

Survey Questions Used from the National Women's Health COVID-19 Study

(continued)

Question	Answer	Source
In the 12 months before the coronavirus pandemic, the food you bought just didn't last and you didn't have money to get more.	1, Often true	Modified ⁸
	2, Sometimes true	
	3, Never true	
What was your living situation before the coronavirus pandemic?	1, I had a steady place to live	Novel
	2, I had a place to live, but I was worried about losing it in the future	
	3, I did not have a steady place to live (I was temporarily staying with others, in a hotel, in a shelter, living outside on the street, on a beach, in a car, abandoned building, bus or train station, or in a park)	
What is your living situation today?	1, I have a steady place to live	8
	2, I have a place to live today, but I am worried about losing it in the future	
	3, I do not have a steady place to live (I am temporarily staying with others, in a hotel, in a shelter, living outside on the street, on a beach, in a car, abandoned building, bus or train station, or in a park)	
In the 12 months before the coronavirus pandemic, did lack of reliable transportation keep you from medical appointments, meetings, work, or from getting things you need for daily living?	1, Yes	8
	0, No	
Since the start of the coronavirus pandemic, is getting reliable transportation...	1, A lot harder than before	Novel
	2, Somewhat harder than before	
	3, No change from before	
	4, Somewhat easier than before	
	5, A lot easier than before	
	77, Don't know	
	99, Refuse	
In the 12 months before the pandemic, did the electric, gas, oil, or water company threaten to shut off services in your home?	1, Yes	Modified ⁸
	0, No	
	2, Already shut off	
Has your electric, gas, oil or water service in your home changed since the start of the coronavirus pandemic?	0, No change	Novel
	1, Yes, one (or more) were turned back on	
	2, Yes, one (or more) were shut off	
	77, Don't know	
	99, Refuse	

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(continued)

SUPPLEMENTAL TABLE 1

Survey Questions Used from the National Women's Health COVID-19 Study

(continued)

Question	Answer	Source
Before the coronavirus pandemic, how often did anyone, including family and friends:	1, Never	Modified ⁸
- Physically hurt you?	2, Rarely	
- Insult or talk down to you?	3, Sometimes	
- Threaten you with harm?	4, Fairly often	
- Scream or curse at you?	5, Frequently	
Has this changed since the start of the coronavirus pandemic?	1, A lot more often	Novel
	2, Somewhat more often	
	3, No change	
	4, Somewhat less often	
	5, A lot less often	
	77, Don't know	
	99, Refuse	

The AHC tool draws on evidence from several need-specific, validated assessments⁹ and was used for this study to harmonize with fast-growing adoption of this tool into clinical practice.^{10,11}

O'Gurek and Henke (2018) provides a list of the assessments from which AHC HRSN items were drawn and the respective validated populations.⁹ Specifically, items assessing food insecurity were validated with caregivers of children in urban medical centers¹² and low-income families and households. Items assessing housing instability were validated with families at risk or experiencing homelessness and veteran populations. Items assessing interpersonal safety were validated with female populations, including female Veterans Health Administration patients¹³ and a sample of predominantly Hispanic women.¹⁴ The item assessing utility needs was validated with families with young children. We are not aware of validated populations for the item assessing transportation difficulties.

Note: BRFSS: Behavioral Risk Factor Surveillance System; NHANES: National Health and Nutrition Examination Survey; SF-12: 12-Item Short Form Survey; CMS AHC HRSN: Center for Medicare & Medicaid Services Accountable Health Communities Health-Related Social Needs

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References

- Centers for Disease Control and Prevention. 2018 BRFSS questionnaire. 2018. Available at: https://www.cdc.gov/brfss/questionnaires/pdf-ques/2018_BRFSS_English_Questionnaire-508.pdf. Accessed March 8, 2021.
- Centers for Disease Control and Prevention, National Center for Health Statistics. NHANES 2017-2018 questionnaire instruments. Centers for Disease Control and Prevention. 2020. Available at: <https://wwwn.cdc.gov/nchs/nhanes/continuousnhanes/questionnaires.aspx?BeginYear=2017>. Accessed XXX.
- Ware J Jr, Kosinski M, Keller SD. A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. *Med Care* 1996;34:220-33.
- Asmundson GJ, Frombach I, McQuaid J, Pedrelli P, Lenox R, Stein MB. Dimensionality of posttraumatic stress symptoms: a confirmatory factor analysis of DSM-IV symptom clusters and other symptom models. *Behav Res Ther* 2000;38:203-14.
- Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med* 2006;166:1092-7.
- Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. *Med Care* 2003;41:1284-92.
- National Center for Health Statistics. 2015-2017 NSFG: public-use data files, codebooks, and documentation. Centers for Disease Control and Prevention. 2021. Available at: https://www.cdc.gov/nchs/nsfg/nsfg_2015_2017_puf.htm. Accessed November 4, 2021.
- Billioux A, Verlander K, Anthony S, Alley DE. Standardized screening for health-related social needs in clinical settings: the accountable health communities screening tool. 2017. Available at: <https://ham.edu/wp-content/uploads/2017/05/Standardized-Screening-for-Health-Related-Social-Needs-in-Clinical-Settings.pdf>. XXX.
- O'Gurek DT, Henke C. A practical approach to screening for social determinants of health. *Fam Pract Manag* 2018;25:7-12.
- Brown JA, Berzin O, Clayton M, et al. Accountable Health Communities (AHC) model evaluation: first evaluation report. 2020. Available at: <https://innovation.cms.gov/data-and-reports/2020/ahc-first-eval-rpt>. Accessed January 29, 2021.
- De Marchis EH, Hessler D, Fichtenberg C, et al. Part I: a quantitative study of social risk screening acceptability in patients and caregivers. *Am J Prev Med* 2019;57(Suppl1):S25-37.
- Hager ER, Quigg AM, Black MM, et al. Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics* 2010;126:e26-32.
- Iverson KM, King MW, Gerber MR, et al. Accuracy of an intimate partner violence screening tool for female VHA patients: a replication and extension. *J Trauma Stress* 2015;28:79-82.
- Chen PH, Rovi S, Vega M, Jacobs A, Johnson MS. Screening for domestic violence in a predominantly Hispanic clinical setting. *Fam Pract* 2005;22:617-23.