

COVID-19 Impact ON What to Expect Pregnant AND Postpartum Consumers AGED 18 – 45 YEARS



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NACCHO
National Association of County & City Health Officials

what to
expect
project

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EXECUTIVE SUMMARY

To better understand the experience of birthing people, parents, and children during the COVID-19 pandemic, three needs assessments were developed for What to Expect consumers and three listening sessions were facilitated among local health department staff.

KEY FINDINGS FROM THE NEEDS ASSESSMENTS

- Respondents reported distress among pregnant and postpartum people because of the implication of the pandemic, such as the loss of a job or increased level of anxiety.
- Regardless of race, urbanicity, income, or age, pregnant people exhibited hesitancy and concern around receiving the COVID-19 vaccine and its impact on themselves and their infants.
- Pregnant and postpartum respondents from rural areas were much less trusting of federal agencies and local public health officials as reliable sources of information regarding COVID-19 vaccines for children compared to respondents residing in urban and suburban areas.

KEY FINDINGS FROM THE LISTENING SESSIONS

- Local Health Department (LHD) staff ensured they met the needs of the community during the pandemic through reliance on partnerships, working outside normal business hours, and creative problem solving.
- LHDs identified new communication methods including a breastfeeding app to improve access to care.
- There is a need to recognize mental health concerns of both the Maternal Child Health (MCH) population and LHD staff during the pandemic.

FUTURE DIRECTIONS

The results of the needs assessments and listening sessions demonstrate the need to prioritize MCH populations' integrations into emergency preparedness planning efforts and to utilize a health equity framework to ensure that historically marginalized communities, communities in rural areas, and low-income communities have access to services amidst a public health threat. Furthermore, it highlights the need for LHDs to strengthen partnerships with community partners such as local clinics, schools, and faith-based organizations to reach the MCH populations during a public health threat, as well as the need to center mental health concerns for this population. As LHDs continue to serve MCH populations, it is vital to support LHDs and the mental health needs of LHD staff to avoid burnout, especially during a public health emergency.

The full report will detail the results and key findings of the three needs assessments and listening sessions.

BACKGROUND

Pregnancies, deliveries, postpartum journeys, and navigating the needs of children and families during COVID-19 have been characterized by reduced support during labor and delivery, increased anxiety around birthing and the health of children, and changes in prenatal and postpartum appointments due to efforts to increase physical distancing in offices. In addition, data shows that COVID-19 puts pregnant people at increased risk of severe complications and even death. A [Morbidity and Mortality Weekly Report \(MMWR\) looking at COVID-19 and stillbirth risks](#) found that pregnant people infected with COVID-19 were at an increased risk of stillbirth in the U.S. compared to pregnant people without COVID-19, with a stronger association during the period of Delta variant predominance. Although stillbirth was a rare outcome overall, these findings highlight the importance of COVID-19 prevention strategies, including vaccination before or during pregnancy. Given the adverse impact of COVID-19 on pregnant and postpartum people it is essential for the public health and medical workforce to prioritize pregnant and postpartum people when planning for public health emergencies.

Furthermore, while young children are less likely to experience severe COVID-19 infections than adolescents and adults, there have been increases in infections and hospitalizations due to the Delta and Omicron variants. In addition, children can spread COVID-19 to other vulnerable groups of individuals. Some children who have had COVID-19 may later develop [Multisystem Inflammatory Syndrome in Children \(MIS-C\)](#), a rare but serious condition associated with COVID-19.

In July 2021, the American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal-Fetal Medicine (SMFM) released a [joint statement](#) recommending that all pregnant individuals be vaccinated against COVID-19. In August 2021, the U.S. Centers for Disease Control and Prevention (CDC) issued their own recommendation and released an [urgent health advisory](#) To increase COVID-19 vaccination among pregnant and lactating people to prevent serious illness, deaths, and adverse pregnancy outcomes. Despite the recommendations from ACOG, CDC and ACIP, only about 70% of pregnant individuals are fully vaccinated with COVID-19 vaccine as of May 14, 2022. In addition,

significant disparities exist in vaccination coverage by race and ethnicity, with vaccination coverage being the lowest (53.9%) for non-Hispanic Black pregnant people.¹ Furthermore, although vaccination is one of the most effective ways to ensure children can continue in-person learning and participation in extra-curricular activities, vaccine hesitance among parents continues to present a challenge in vaccinating the younger population. As of November 2021, everyone 5 years and older is eligible to receive a COVID-19 vaccine, yet vaccination coverage among children and adolescents is lower than in older groups, with only 6.8% of children ages 12-17 and 3.9% of children ages 5-11 receiving at least one dose.²

To better understand the experience of pregnant and birthing people during the COVID-19 pandemic, NACCHO, in partnership with the What to Expect Project and through funding from CDC's Division of Reproductive Health, developed three needs assessments for What to Expect consumers. The assessments collected information on how COVID-19 has impacted reproductive health decision-making, parental decision-making, mental health during pregnancy, and pregnancy and birth-related health-seeking behaviors. Additionally, NACCHO conducted listening sessions with LHD staff that continued to support the MCH population during the pandemic. To ensure public health is ready for future public health emergencies, it is essential to understand the experiences and lessons of COVID-19.

The needs assessments covered the following objectives:

- To optimize vaccine uptake, understand pregnant and postpartum individuals' perceptions of and attitudes toward COVID-19 vaccination in pregnancy and their children.
- Explore the impact of the COVID-19 pandemic on pregnant and postpartum individuals' mental health and identify factors most strongly associated with greater changes in anxiety and depression.
- Understand the impact of COVID-19 on pregnant and postpartum individuals, especially related to accessing healthcare, vaccination, family planning, and mental health.
- The listening sessions covered the following objective:
- Understand LHD staff's perspectives on needs among pregnant and postpartum persons and parents of young children during COVID-19.

METHODS

Data were collected via 1) needs assessments for pregnant, postpartum people, and parents and 2) through listening sessions for LHD staff who support MCH populations. Three separate needs assessments were administered through brief questionnaires using the Qualtrics platform between March and August 2021. Data were collected via links on WhatToExpect.com channels, including the mobile app feed and subscribers. The target audience included U.S. residents between 18 and 45 years old that were either currently pregnant or had at least one infant less than 12 months old.

NEEDS ASSESSMENT QUESTIONNAIRE METHODS

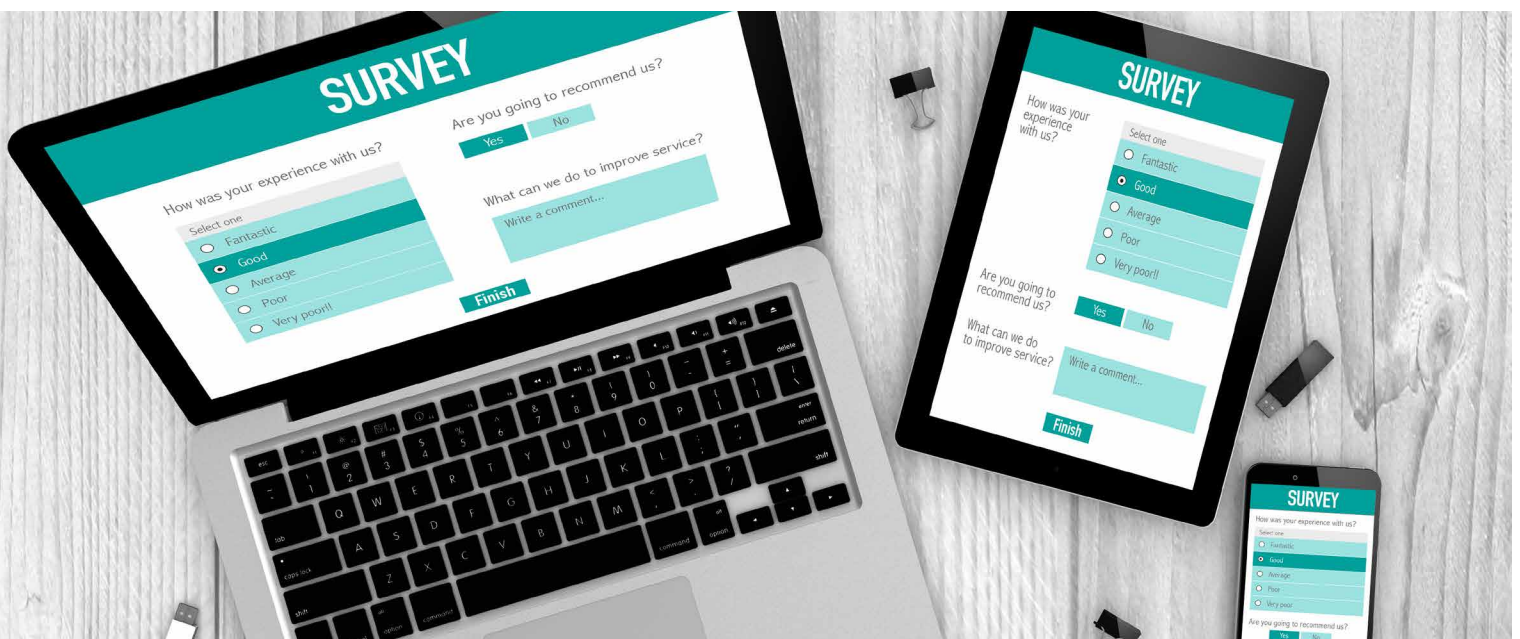
Wave I of the needs assessment was conducted from 3/22/21-4/5/21. This needs assessment covered a range of topics that pregnant and postpartum people experienced during the pandemic including pregnancy intention, change in medical appointments, mental health status, and changes in programming, resources, and medical services. Wave II of the needs assessment was conducted from 7/27/21-8/3/21. This assessment covered topics including COVID-19 vaccines for pregnant and postpartum people and their children and family planning. Wave III of the needs assessment was conducted from 8/17/21-8/24/21. The purpose of this needs assessment was to identify concerns, information gaps, and experiences related to mental health needs among pregnant and postpartum individuals.

Wave I was administered as an opportunity to inform content and assessments for Wave II and Wave III. Thus, a simple comparative analysis was done to assess the

characteristics of Wave I data. Priority areas identified in Wave I informed the creation of Wave II and III. Univariate and bivariate visual comparisons were done to assess characteristics of Wave II and Wave III data. Family planning, pregnant and postpartum vaccination, and child vaccination outcomes for Wave II, and depression, anxiety, reasons for feeling depressed and anxious, coping mechanisms, and mental health resource outcomes for Wave III were visually compared with demographic and maternal descriptor variables. Statistical methods were not used to test for associations in the data, and therefore, no statistical significance is reported. Tableau Desktop version 2020 was used for all visual comparisons.

For all three needs assessments, the multi-categorical race variable was condensed into a dichotomous variable of “white” and “BIPOC.” “White” included respondents that identified as Caucasian/White and Non-Hispanic. “BIPOC” included respondents that identified as Asian or Pacific Islander, Black or African-American, Native American or Alaskan Native, Multi-Racial, or Other reported race. “BIPOC” also included Caucasian/white respondents that reported ethnicity of Hispanic. This combining was done due to low disproportionate numbers reported among “BIPOC” respondents. Further breakdown of measures by the original categories of race were performed where large differences were seen between “white” and “BIPOC”, specifically with the Black or African-American category.

A dichotomous *Pandemic Pregnancy* variable was created



for all waves of data including “Currently Postpartum” and “Currently Pregnant” categories. “Currently Postpartum” was defined as those respondents with a 0-12-month-old infant at the time of the needs assessment. “Currently Pregnant” was defined as those who reported to be currently pregnant regardless of whether the pregnancy started prior to May 2021 or not. Respondents that met both criteria for “Currently Pregnant” and “Currently Postpartum” were placed in the “Currently Postpartum” category.

The standardized Patient Health Questionnaire-9 (PHQ-9) and General Anxiety Disorder-7 (GAD-7) scales were utilized in Wave III to assess depression and anxiety, respectively, in respondents. Items for each scale were assigned a value based on the response and summed independently to determine a final depression and anxiety score. The summed scores were then placed in a value range to determine depression and anxiety severity. The validated methods and severity categories were used for both the PHQ-9 and GAD-7.^{3,4} In addition to depression and anxiety severity scores, the relative difference was calculated to show the percent increase in the number of respondents reporting any depression or anxiety symptoms (independent of severity) during the pandemic, relative to pre-pandemic.

Some limitations should also be considered. The needs assessments were only distributed to What to Expect consumers in an online format, resulting in a small and limited representation of the national birthing population. The majority of the respondents were white and highly educated. Each needs assessment was only put out in the field for two weeks, which may have limited the number of respondents.

LISTENING SESSION METHODS

The Center for Public Health Innovation at CI International (CPHI) conducted three listening sessions for NACCHO. The goal was to understand participant perspectives on needs among pregnant and postpartum persons and parents of young children during COVID-19. A total of 18 public health workers representing 13 LHDs actively participated in virtual listening sessions held using Zoom Video Communications, Inc. (“Zoom”). Thirty-two public health workers expressed an interest in being part of the listening session. These 32 potential participants were asked to self-describe the size of the LHD using the definition provided by NACCHO: (1) Small LHD (<50,000 people in their community), (2) Mid-sized LHD (50,000-499,000 people), and (3) Large LHD (>500,000 people). A total of 18 people took part in the listening sessions. There were:

- 7 participants in the Small LHD session. Two of these participants identified themselves as being from a Mid-Sized LHD.
- 6 in the Mid-sized LHD session.
- 5 in the Large LHD session. One of these participants identified as being from a Mid-Sized LHD.

All listening sessions were recorded using Zoom and the audio files were transcribed. Two coders independently coded the transcripts to identify themes using NVivo.⁵ While the conversations within the listening sessions were robust and insightful, only three listening sessions were held, and each group had participants from different sized LHDs. As a result, one limitation of the listening session is that we were unable to reach saturation of themes. In this report, we include themes that support or could provide insight into the needs assessment findings and themes that are supported through a literature review.



RESULTS

A total of 5,783 What to Expect needs assessments were received across all three assessments. Results reported in the sections below were chosen based on the most relevant stories that appeared during visual comparisons of the data. Some detail in the results may be lost due to rounding.

NEEDS ASSESSMENT - WAVE I

Of WTPE’s consumership, a total of 2,879 respondents submitted a complete Wave I questionnaire. Respondents were mostly aged 26-35 years old (63%), 52% lived in a suburban area, and 71% were white. Forty-eight (48%) of respondents were pregnant and 52% of respondents were postpartum (had a child within the last 12months). See Chart 1 below

Category	Sub-Category	Frequency (N)	Percentage %
Pregnancy Status	Pregnant	1388	48
	Postpartum (has a baby <12)	1491	52
Urbanicity	Urban	657	23
	Suburban	1495	52
	Rural	705	25
Age	18 – 25	697	24
	26 - 35	1818	63
	36 - 45	364	13
Race/Ethnicity	Asian	97	3
	Black	252	9
	White	2042	71
	NA/PI	19	1
	Mixed	263	9
	Hispanic	459	15
	Prefer not to answer	134	5
	Other	72	2

*For all waves, the multi-categorical race variable was condensed into a dichotomous variable of “white’ and “BIPOC”. “White” included respondents that identified as Caucasian/white and Non-Hispanic. “BIPOC” included respondents that identified as Asian or Pacific Islander, Black or African American, Native American or Alaskan Native, Multi-Racial, or Other reported race. “BIPOC” also included Caucasian/White respondents that reported an ethnicity of Hispanic. This combining was done due to low disproportionate numbers reported among “BIPOC” respondents.

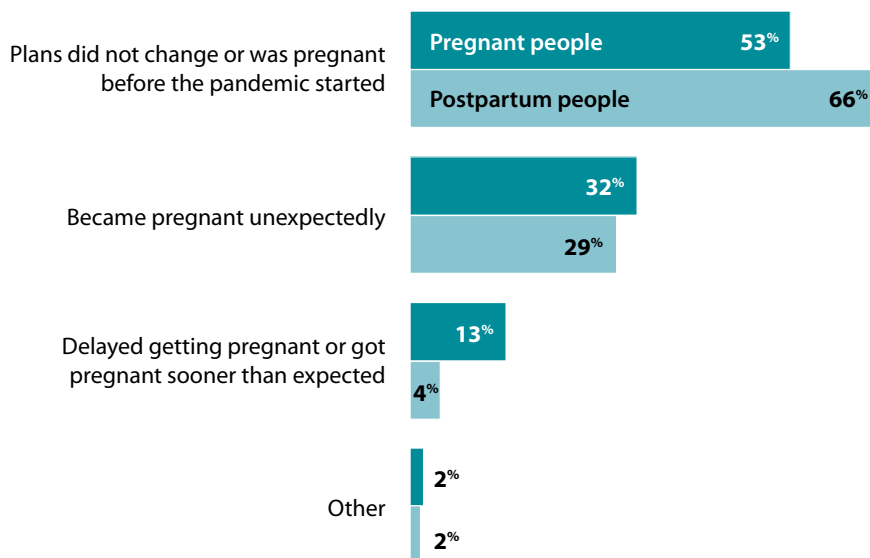


Change in Pregnancy Plans because of COVID-19

A majority of pregnant (53%) respondents indicated that the pandemic did not change their pregnancy plans while some (32%) indicated that they became pregnant unexpectedly, (15%) chose to delay pregnancy or became pregnant sooner than expected. However, changes in pregnancy plans differed by demographics. Among those that became pregnant unexpectedly, more BIPOC and “other” race pregnant people and Hispanic people indicated getting pregnant unexpectedly when compared to white pregnant people.

For postpartum people, 34% indicated that the pandemic did not change their pregnancy plans. Thirty-two (32%) became pregnant before the pandemic started and twenty-nine percent (29%) became pregnant unexpectedly with fifteen (15%) delaying pregnancy, becoming pregnant sooner or selected “other”. More young postpartum people (18-25) (50%) indicated getting pregnant unexpectedly during the pandemic. More BIPOC people were more likely to have gotten pregnant unexpectedly, followed by their plans not changing. For Hispanic postpartum respondents 46% got pregnant unexpectedly, and 30% were pregnant when the pandemic started. Postpartum people who lived in urban areas were more likely to get pregnant unexpectedly or were pregnant before the pandemic. *See Figure 1 below*

Figure 1. Changes in pregnancy plans because of the COVID-19 pandemic
Percent of respondents



n(pregnant)=1,388
n(postpartum)=1,491



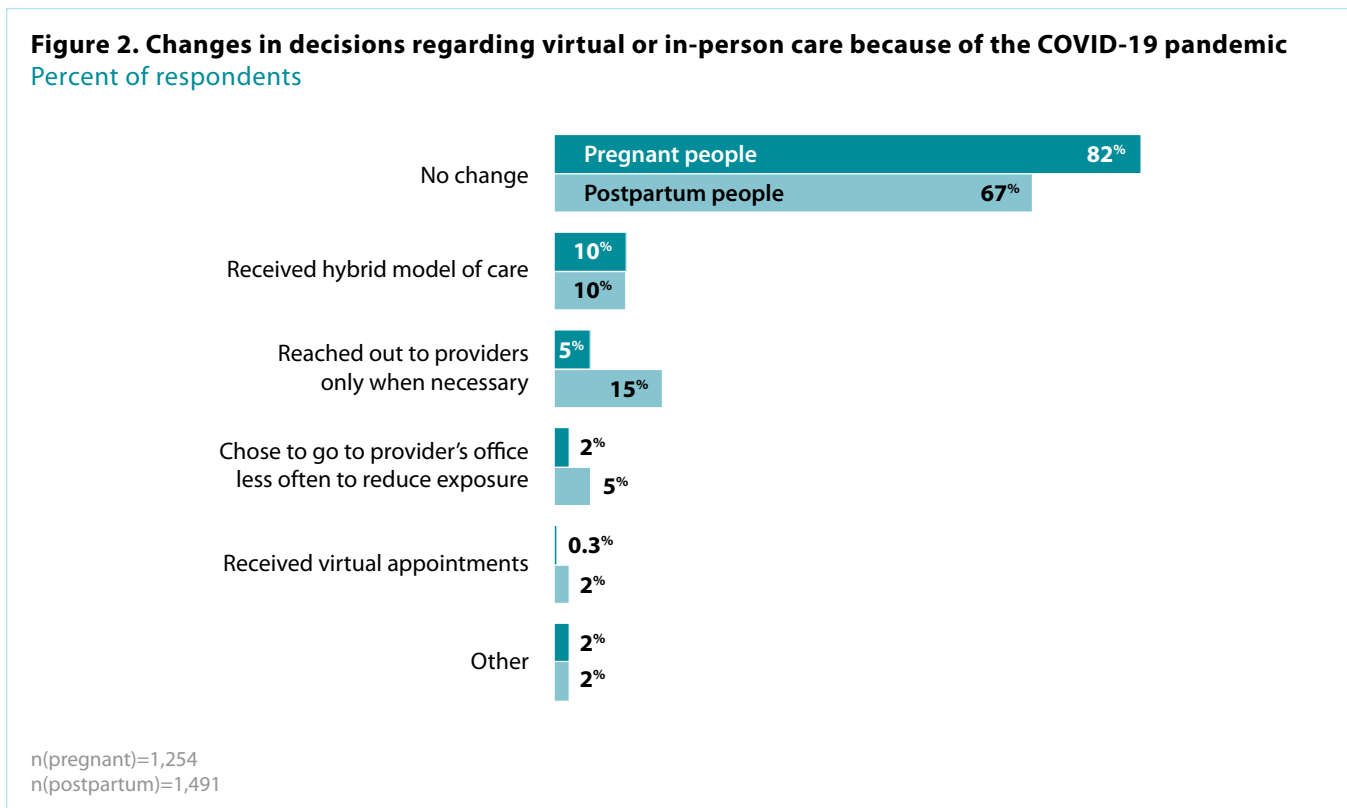
The impact of the pandemic on opting for virtual or in-person prenatal care

When asked how the pandemic has changed decisions regarding virtual or in-person care, approximately 82% of pregnant respondents indicated that the pandemic did not change their decisions regarding virtual or in-person care compared to 18.5% of pregnant respondents that indicated that it did—with the most common changes being deciding to receive a hybrid model of care (i.e., mix of in-person or virtual appointments) (10%) and reaching out to providers only when necessary, such as in an emergency or pregnancy concerns (5%).

Comparatively, 66.5% of postpartum respondents indicated that the pandemic did not change their decisions regarding virtual or in-person care; 15% indicated that they only reached out to their provider when necessary (e.g., emergency or postpartum concerns); and 10% indicated they received a hybrid model of care (mix of in-person and virtual appointments).

Other less common changes that pregnant people and postpartum respondents made to their virtual or in-person care included choosing to go into their provider's office less often to reduce exposure (2% and 5%, respectively), receiving virtual appointments for their care (0.3% and 2%), and some other change (2% for both groups).

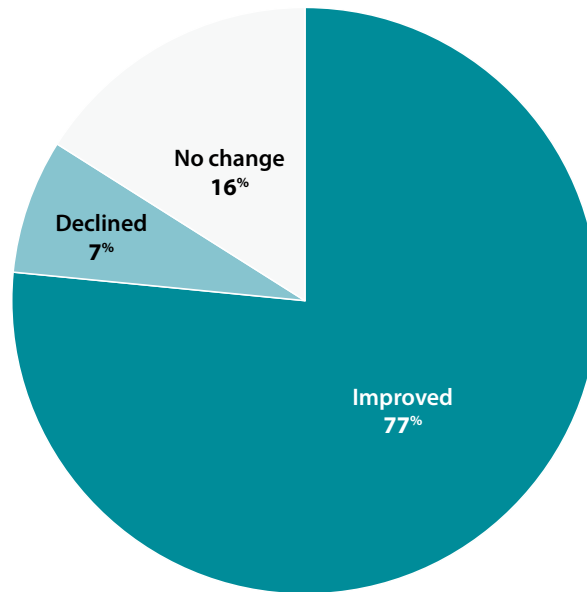
For some respondents, the decision making on virtual, or in-person appointments were based on external factors such as medical care policies, COVID-19 protocols, stage of pregnancy, etc., thus skewing this data. See Figure 2.



Satisfaction Level of Prenatal and Postpartum Care During the Pandemic

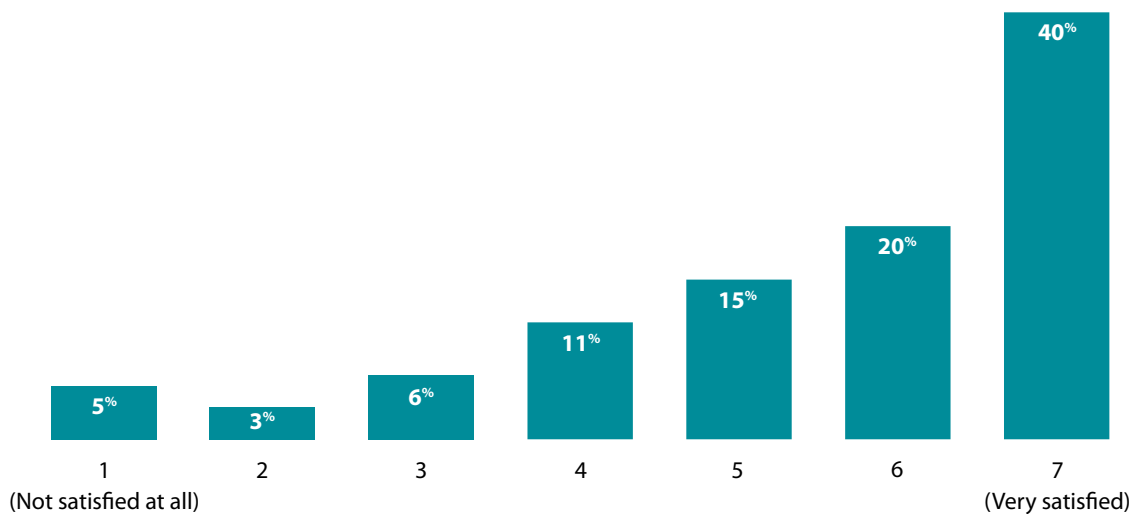
Respondents rated their satisfaction with care on a 7-point scale from 1 being not satisfied at all to 7 being very satisfied. To calculate satisfaction change, the satisfaction of the care they received during the pandemic was subtracted from the care they received pre-pandemic. Pregnant people reported an improvement in care from before to during the pandemic (Figure 3), while postpartum respondents were satisfied by the care they received during the pandemic (Figure 4).

Figure 3. Changes in satisfaction of care pregnant people received the COVID-19 pandemic
Percent of respondents



n=1,254

Figure 4. Level of satisfaction of care postpartum people received the COVID-19 pandemic
Percent of respondents

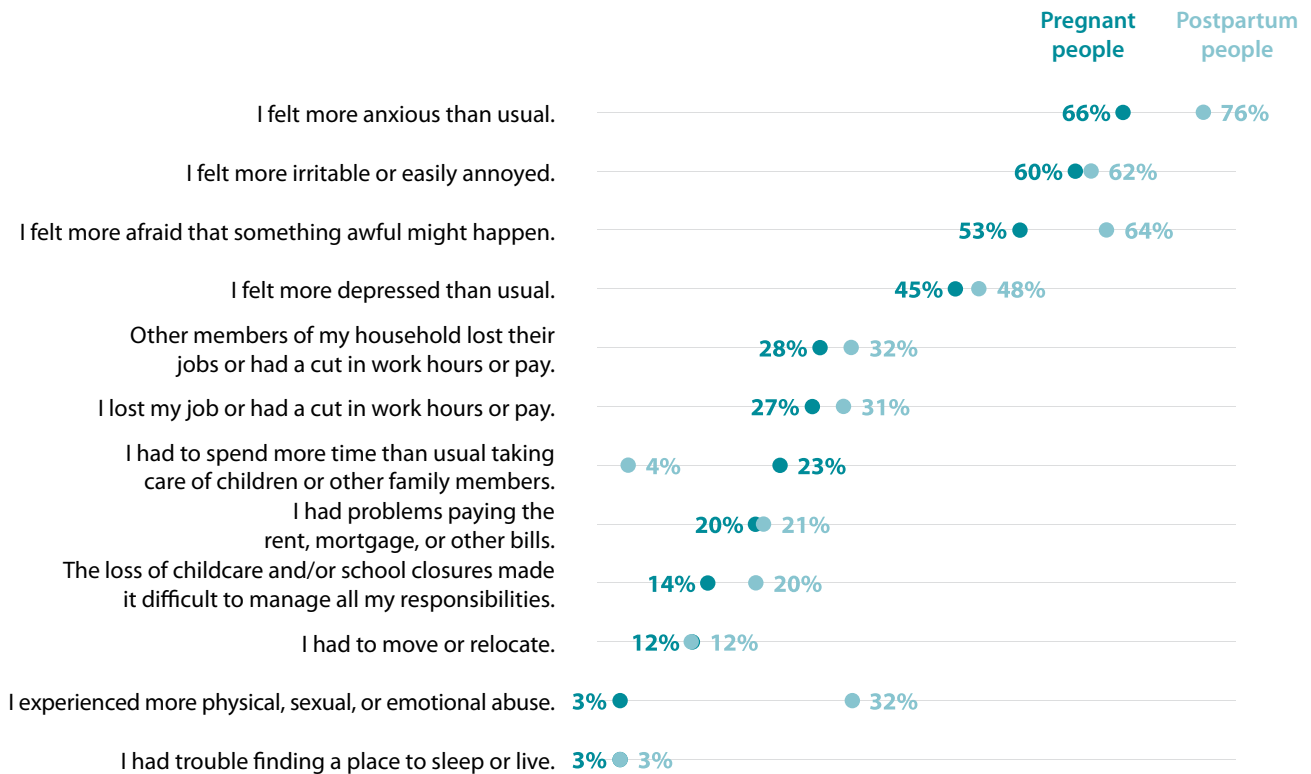


n=1,491

The Impact of Distress on Pregnant and Postpartum People During the Pandemic

For the purposes of this needs assessment, distress is defined as an unpleasant emotion, feeling, thought, condition, or behavior. Both pregnant and postpartum people experienced increased levels of distress during the pandemic. Job loss or decrease in pay contributed to higher distress level. Additionally, pregnant (66%) and postpartum (76%) people indicated high levels of anxiety because of the pandemic. For both pregnant and postpartum people, distress levels varied greatly among racial and ethnic groups. BIPOC respondents are more likely to experience specific experiences during the pandemic, including loss of own or family member's job, spent more time taking care of children/family members, and trouble paying bills. See figure 5-6 below

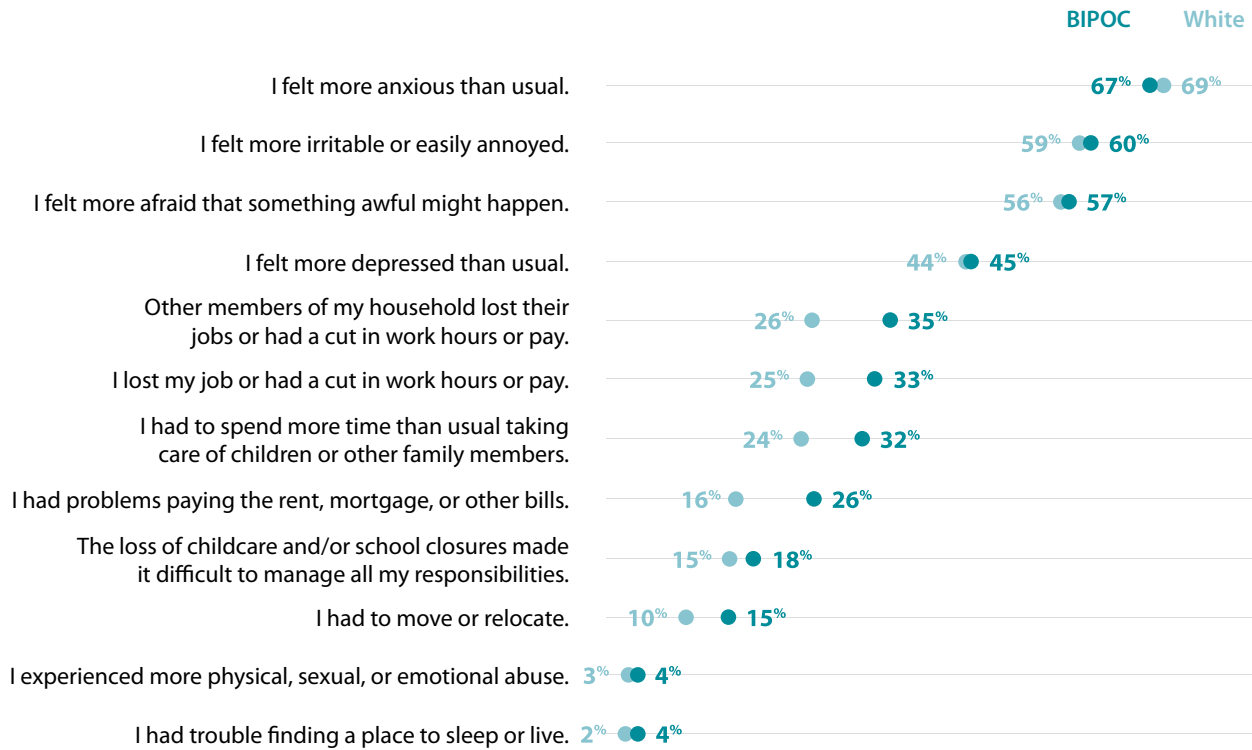
Figure 5. Experiences of distress during the COVID-19 pandemic
Percent of respondents



n(pregnant)=1,389
n(postpartum)=1,491



Figure 6. Experiences of distress during the COVID-19 pandemic, by racial/ethnic identity
Percent of respondents



n(white)=1,851-1,852
n(BIPOC)=958



NEEDS ASSESSMENT - WAVE II

Of WTEP’s consumership, a total of 1,183 respondents submitted a complete Wave II questionnaire. Respondents were predominantly 26 – 35 years of age (61.2%), currently pregnant (69.4%), and raising at least one child (56.9%). In addition, most respondents were white/Caucasian (76.2%) of non-Hispanic descent (85.5%), who were highly educated with a college degree or better (64.3%) with a full-time job (61.5%) earning an annual household income of greater than or equal to \$75,000 (54.7%) and living in a suburban area (49.2%).

Category	Sub-Category	Frequency (N)	Percentage %
Pregnancy Status	<i>Pregnant</i>	658	55.6
	<i>Postpartum (has a baby <12)</i>	424	35.8
Urbanicity	<i>Urban</i>	273	23.1
	<i>Suburban</i>	582	49.2
	<i>Rural</i>	323	27.3
Age	<i>18 - 25</i>	238	20.1
	<i>26 - 35</i>	713	60.3
	<i>36 - 45</i>	232	19.6
Race/Ethnicity	<i>Asian</i>	49	4.1
	<i>Black</i>	119	10.11
	<i>White</i>	901	76.2
	<i>NA/PI</i>	32	2.7
	<i>Mixed</i>	83	7.0
	<i>Hispanic</i>	162	13.7
	<i>Prefer not to answer</i>	49	4.1
	<i>Other</i>	32	2.7
Annual Household Income	<i>< \$25,000</i>	125	10.6
	<i>\$25,000 - \$34,999</i>	87	7.4
	<i>\$35,000 - \$49,999</i>	110	9.3
	<i>\$50,000 - \$74,999</i>	161	13.6
	<i>\$75,000 - \$99,999</i>	179	15.1
	<i>\$100,000 - \$149,999</i>	212	17.9
	<i>>= \$150,000</i>	192	16.2
Education Level	<i>Some High School</i>	30	2.5
	<i>High School Graduate</i>	150	12.7
	<i>Some College</i>	234	19.8
	<i>College Graduate</i>	432	36.5
	<i>Some Postgraduate</i>	58	4.9
	<i>Postgraduate Degree</i>	271	22.9

*NA/PI = Native American/Pacific Islander



Family Planning

Of those surveyed, 67.6% reported that the pandemic had no impact on their access to family planning services. When assessing how the pandemic impacted family planning decisions, white respondents were more likely to report no change in family planning decisions (41.2%) compared to BIPOC respondents (31.3%), and BIPOC respondents were more likely to have become pregnant unexpectedly (38%), compared to white respondents (18.4%). However, overwhelmingly, respondents reported that the pandemic has not impacted their decision to expand their family (79.1%), with only 6.9% wanting to have fewer children than previously planned (Figure 7 below).

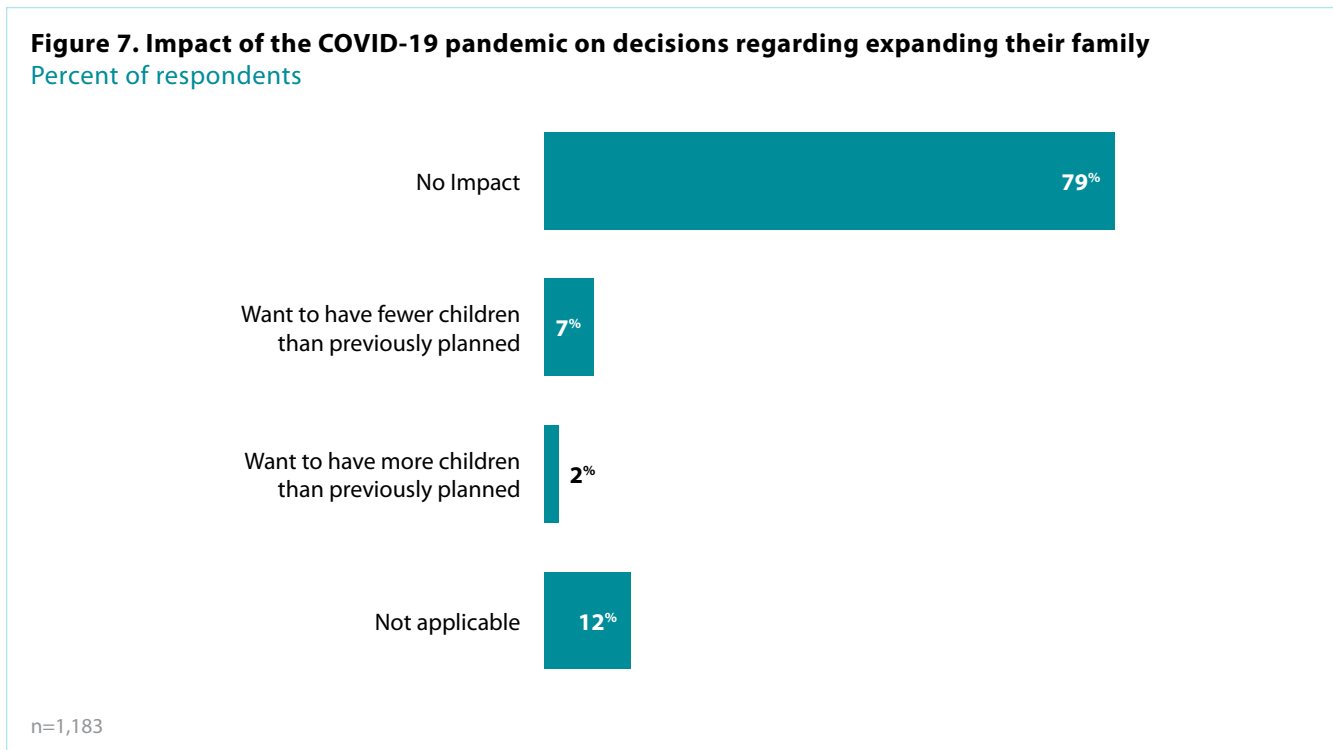
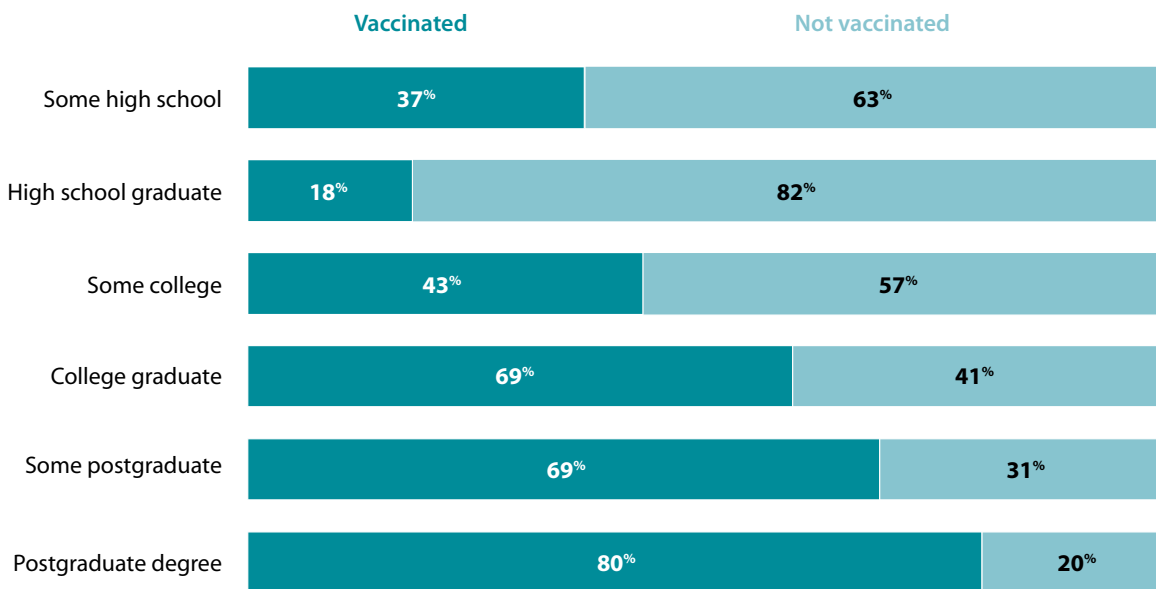


Figure 7: Pandemic has mostly not impacted decisions to expand families.

COVID-19 Vaccination Status

At the time the survey was administered, 55% of respondents reported being fully vaccinated for COVID-19. A higher percentage of vaccinated respondents reported receiving COVID-19 vaccine information from doctors and healthcare providers (75.6%), federal agencies (73.1%), and local public health officials (42.4%), while a higher percentage of non-vaccinated respondents reported receiving vaccine information from friends or family (23.3%), social media (9.3%), or other undefined sources (15.7%). Respondents living in suburban (64.1% vaccinated) and urban (57.5% vaccinated) areas were more likely to be vaccinated compared to respondents living in rural areas (38.4% vaccinated). Respondents defined as currently in postpartum were also more likely to be vaccinated (64.4%), compared to currently pregnant respondents (48%). Additionally, vaccination status changed based on education levels (Figure 8). Respondents that had some graduate level schooling or a graduate degree were more likely to be vaccinated (78.1% vaccinated) compared to respondents with an undergraduate degree or some college experience (53.8% vaccinated), and both groups were more likely to be vaccinated than respondents with only a high school education (21.1% vaccinated).

Figure 8. COVID-19 vaccination status, by level of education completed
Percent of respondents



n=1,183





COVID-19 Vaccines during Pregnancy and Postpartum

The perception of whether the vaccine was the best method for protecting themselves and their babies from COVID-19 varied between respondents based on residential area and pregnancy status. One in four respondents living in rural areas strongly disagreed with the vaccine being the best method for protecting themselves and their babies from contracting COVID-19, versus one in eight respondents living in suburban or urban areas. Pregnant respondents, compared to postpartum respondents, were more than twice as likely to strongly disagree that the COVID-19 vaccine is the best method for protecting themselves and their babies from contracting COVID-19 (Currently Pregnant = 20.3% vs. Current Postpartum = 8.8%). BIPOC, currently pregnant, and rural respondents were more likely to report possible harmful side effects as being very important in making the decision whether to receive the vaccine including side effects on the unborn baby, on the mother’s body, on the ability to breastfeed, and the possibility of having a miscarriage (Figure 9).

Figure 9. Impact of perceptions about potential harmful side effects on decisions regarding receiving the COVID-19 vaccine

Percent of respondents reporting factor as “very important”

Potential harmful effects on:	My unborn baby	My body	My ability to breastfeed	My chances of a miscarriage
By race				
White	58%	38%	35%	48%
BIPOC	67%	50%	49%	58%
By pregnancy status				
Pregnant people	65%	47%	42%	58%
Postpartum people	64%	38%	43%	48%
By residence				
Urban	62%	41%	39%	50%
Suburban	59%	38%	40%	49%
Rural	65%	49%	42%	57%

n=1,183

Figure 9: Percentage of respondents that rated the listed factors as “Very Important” in making their decision whether or not to receive the COVID-19 vaccine.

COVID-19 Vaccines for Children

COVID-19 vaccinations for children ages 12 to 15 became available two months prior to the dissemination of this needs assessment, and vaccinations for children ages 5 to 11 were not yet approved. Of the 76 respondents with a child aged 12-15 years old, 65% did not yet have their child vaccinated, and of those, only 14% said they planned to have their 12–15-year-old vaccinated at some point.

There were 727 respondents with a child under 12 years of age. When asked if they would vaccinate their children if a COVID-19 vaccine became available for children under 12, only 22.3% living in rural areas said they would, versus 38.8% living in suburban areas, and 42.1% living in urban areas.

Respondents of the Wave II needs assessment residing in rural areas reported much less trust in federal agencies and local public health officials as reliable sources of information regarding COVID-19 vaccines for children (Figure 10). The listening sessions also detailed similar responses related to the negative public perception of the public health COVID-19 response.

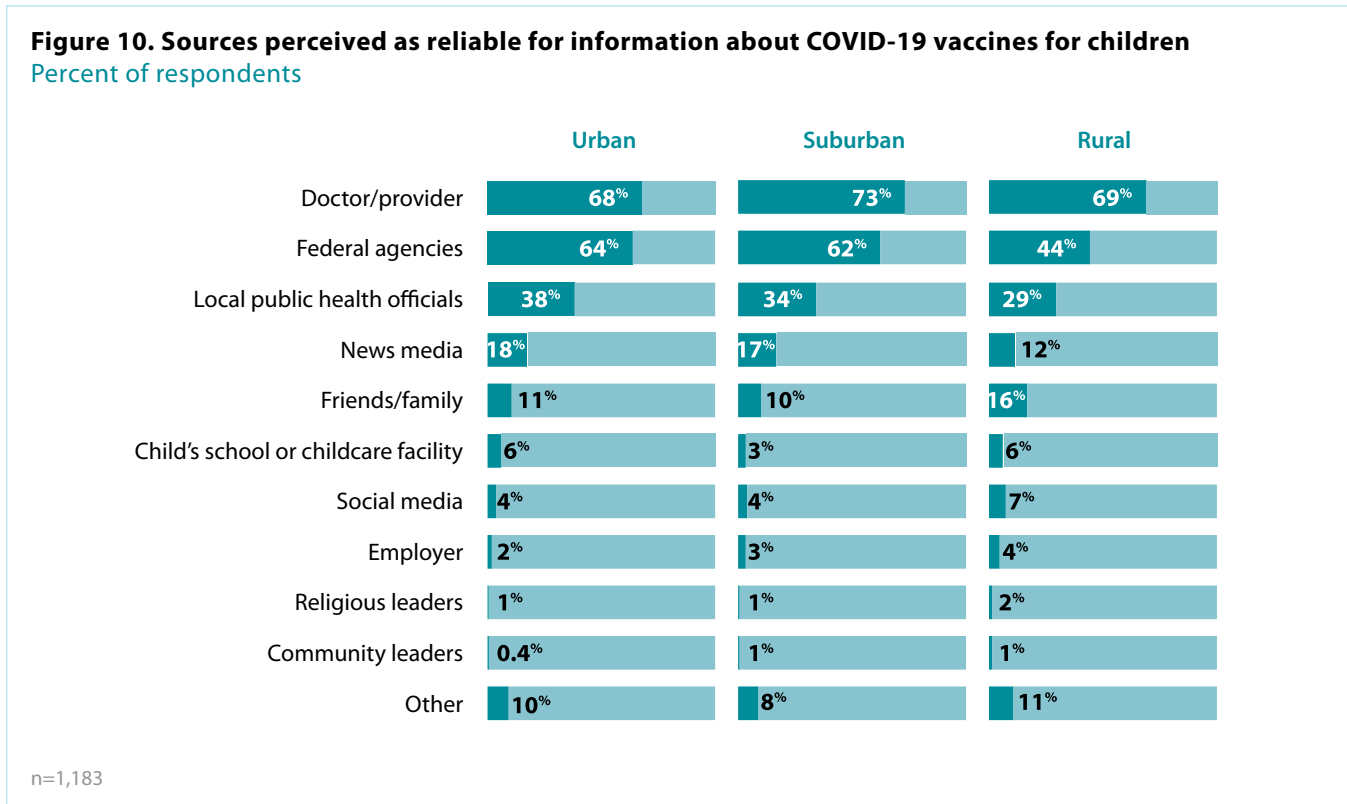


Figure 10. Participants from rural areas are much less trusting of federal agencies and local public health officials as reliable sources of information regarding COVID vaccines for children.



NEEDS ASSESSMENT - WAVE III

A total of 1,721 respondents submitted a complete Wave III questionnaire. Respondents were defined as female mothers or expecting mothers predominantly 26 – 35 years of age (61.2%), currently pregnant (56.6%), and already raising at least one child (64.4%). Most respondents were White/Caucasian (72.9%) of Non-Hispanic descent (85.5%), who were highly educated with a college degree or higher (60.4%) with a full-time job (59.9%) earning an annual household income of less than \$75,000 (51.3%) and living in a suburban area (49.2%).

Category	Sub-Category	Frequency (N)	Percentage %
Pregnancy Status	<i>Pregnant</i>	1,107	64.3
	<i>Postpartum (has a baby <12)</i>	488	28.4
Urbanicity	<i>Urban</i>	444	25.8
	<i>Suburban</i>	846	49.2
	<i>Rural</i>	418	24.3
Age	<i>18 - 25</i>	383	22.3
	<i>26 - 35</i>	1,054	61.2
	<i>36 - 45</i>	284	16.5
Race/Ethnicity	<i>Asian</i>	77	4.5
	<i>Black</i>	226	13.1
	<i>White</i>	1,255	72.9
	<i>NA/PI</i>	36	2.1
	<i>Mixed</i>	112	6.5
	<i>Hispanic</i>	272	15.8
	<i>Prefer not to answer</i>	64	3.7
	<i>Other</i>	61	3.5
Annual Household Income	<i>< \$25,000</i>	214	12.4
	<i>\$25,000 - \$34,999</i>	178	10.3
	<i>\$35,000 - \$49,999</i>	170	9.9
	<i>\$50,000 - \$74,999</i>	244	14.2
	<i>\$75,000 - \$99,999</i>	196	11.4
	<i>\$100,000 - \$149,999</i>	286	16.6
	<i>>= \$150,000</i>	281	16.3
Education Level	<i>Some High School</i>	46	2.7
	<i>High School Graduate</i>	243	14.1
	<i>Some College</i>	386	22.4
	<i>College Graduate</i>	568	33
	<i>Some Postgraduate</i>	67	3.9
	<i>Postgraduate Degree</i>	404	23.5



Self-Reported Depression

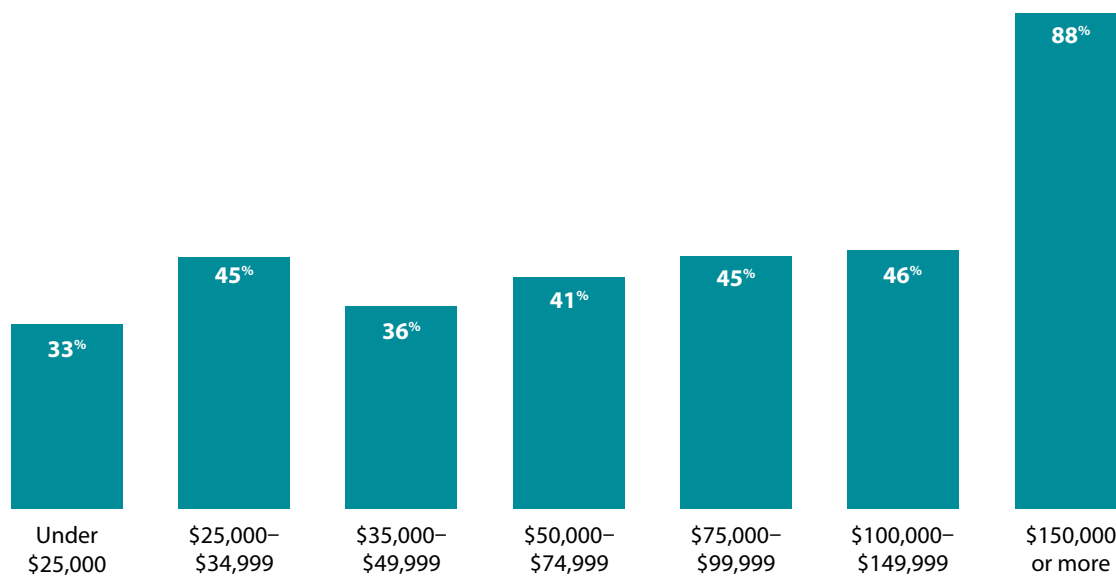
The median depression severity score from the PHQ-9 was 5 (IQR: 2 – 8) indicating no worse than mild depressive symptoms for the cohort, on average. However, severity of depressive symptoms was higher for mothers or expecting mothers that were younger, making a lower annual income, or unemployed. Respondents aged 18 – 25 years of age reported, on average, mild depressive symptoms (Median = 7, IQR: 4 – 11) compared to minimal or no depressive symptoms reported by respondents 26 to 45 years of age (Median = 4, IQR: 2 – 8). Respondents earning less than \$50k annually also reported having mild depressive symptoms (Median = 7, IQR: 3 – 11) compared to minimal or no depressive symptoms in respondents earning greater than or equal to \$50k annually (Median = 4, IQR: 2 – 7). Figure 11 shows the distribution of PHQ-9 scores across all income categories reported.



Figure 11: Median and distribution of depression severity scores increases as annual income decreases. Though the severity of reported depressive symptoms were greater among lower income respondents, the greatest percent increase in the number of respondents reporting any level of depressive symptoms during the pandemic, relative to pre-pandemic, occurred in the highest income level bracket (>=\$150k) at 87.7% (Figure 12). This increase is nearly twice as high as the as the next highest income level bracket.

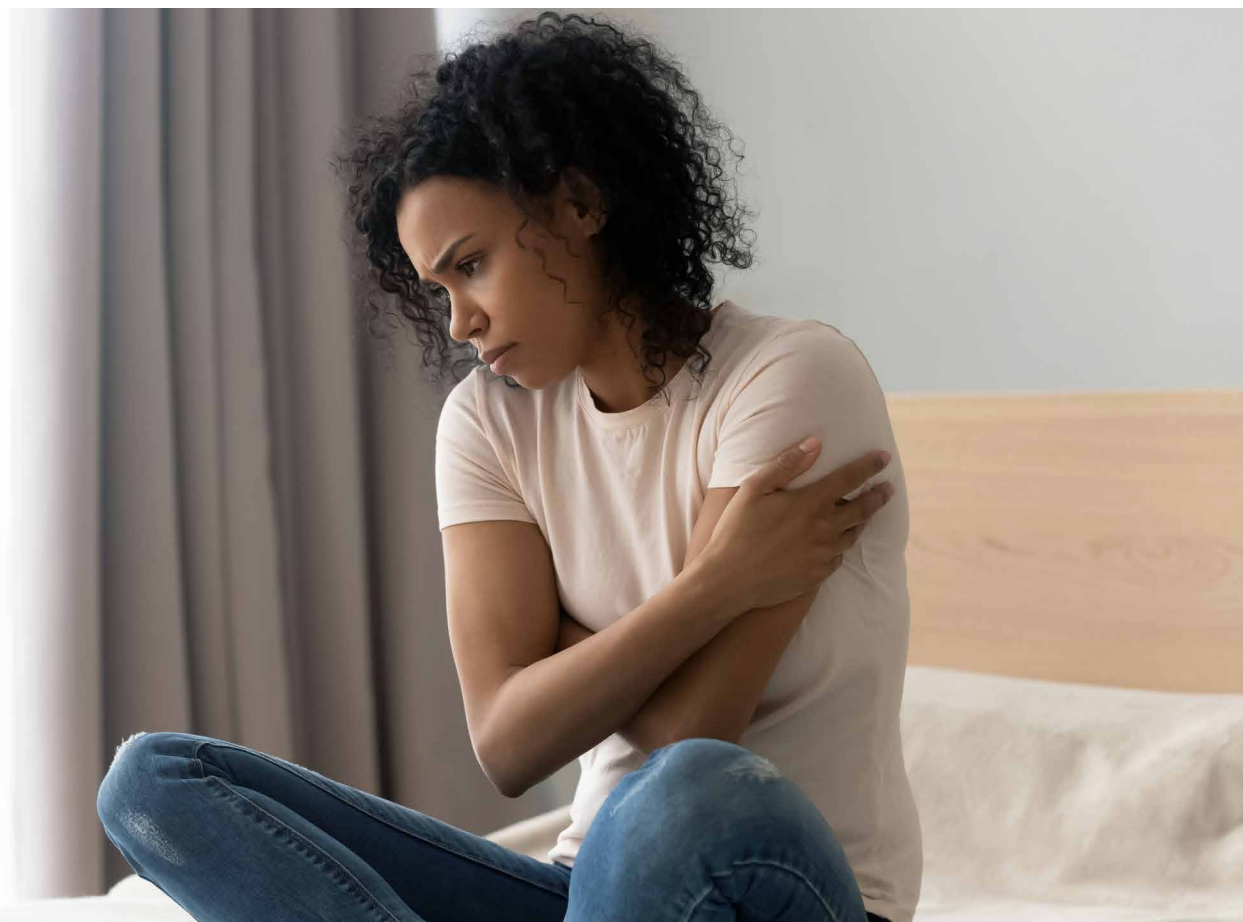
Figure 12. Changes in number of respondents with depressive symptoms from before to during the pandemic, by gross annual income

Percent of respondents



n=1,721

Figure 12: The number of participants reporting any level of depressive symptoms during the pandemic increased by 87.7% for individuals earning an annual income of \$150,000 or higher.



Self-Reported Anxiety

The median anxiety severity score from the GAD-7 was 5 (IQR: 2 – 9) indicating no worse than mild anxiety symptoms for the cohort, on average. However, severity of anxiety symptoms was higher for mothers or expecting mothers that were younger, making a lower annual income, or unemployed. Respondents aged 18 – 25 years of age reported, on average, mild anxiety symptoms (Median = 7, IQR: 3 – 12) compared to minimal or no anxiety symptoms reported by respondents 26 to 45 years of age (Median = 4, IQR: 2 – 8). Respondents earning less than \$50k annually also reported having mild anxiety symptoms (Median = 6, IQR: 3 – 12) compared to minimal or no anxiety symptoms in respondents earning greater than or equal to \$50k annually (Median = 4, IQR: 2 – 7). Similarly, unemployed respondents reported mild anxiety symptoms (Median = 6, IQR: 3 – 11) compared to minimal or no anxiety symptoms for respondents working full time or part time (Median = 4, IQR: 2 – 9).

Though there was no difference in the severity of anxiety symptoms reported between white and BIPOC respondents, the number of respondents reporting any level of anxiety symptoms during the pandemic, relative to pre-pandemic, increased by 40% for BIPOC respondents, which was nearly twice the increase for white respondents. When broken down further by race categories, the increase in Asian or Pacific Islander respondents reporting anxiety symptoms was three times the increase for white respondents (Figure 13).

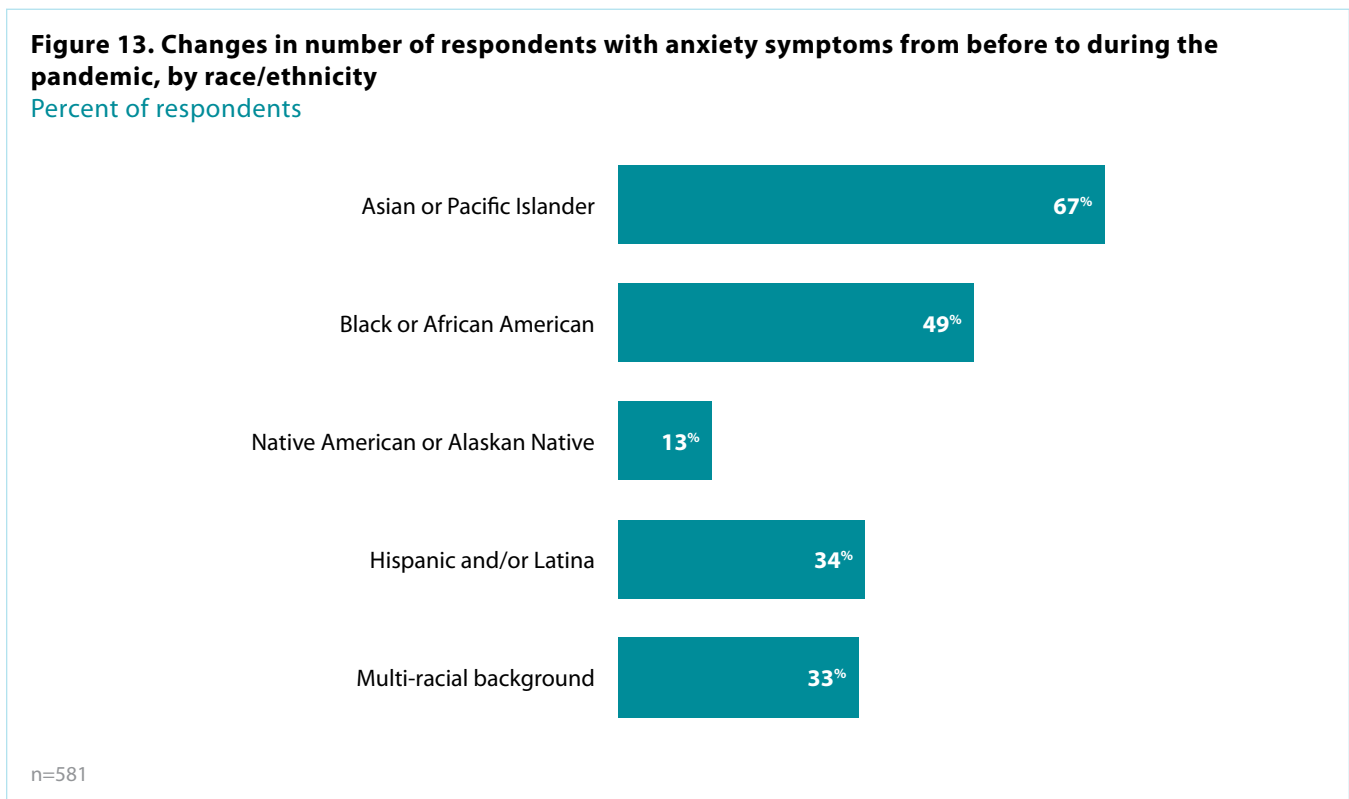


Figure 13: The number of participants reporting any level of anxiety symptoms during the pandemic increased by 67% for Asian or Pacific Islander participants and by 47% for Black or African American participants.



Mental Health Resources, Services, and Treatment

Among the respondents, 786 reported needing mental health services during the pandemic. Of those 786 respondents, those living in urban areas were less likely to receive needed mental health services (54.8%) than those living in suburban (60.4%) or rural areas (61.6%). Similarly, BIPOC respondents were less likely to receive needed mental health services (51.4%) than white respondents (64.1%). When asked for reasons why needed mental health services were not received, the most frequent answers reported when stratified by residential area were that treatment could not be afforded and that they didn't have time to receive treatment. When stratified by race, the most frequent reasons given were that they could not afford treatment and that they did not know where to go to receive services.

Listening Sessions with LHD Staff

A total of 18 public health workers representing 13 LHDs actively participated in virtual listening sessions held using Zoom. The goal was to understand participant perspectives on needs among pregnant and postpartum persons and parents of young children during COVID-19. Since it is not feasible to report on all data points received, results reported in the sections below were chosen based on the most relevant stories that appeared during visual comparisons of the data. Some detail in the results may be lost due to rounding.

Findings on Needs of the MCH Population During COVID-19

Public health practitioners in at least two listening sessions felt their communities needed to acquire basic family needs (e.g. food, child-care, internet connectivity, employment), get medical care in-person or online for themselves and/or their children, access basic baby supplies (e.g. clothing, formula, car seats), and receive accurate COVID-19 information. Data from the WTE needs assessments reinforces that these needs were important to community members and the concerns about the ability to meet these needs contributed to the anxiety and depression felt by pregnant/postpartum people. Specifically, concern about the health of children and family was the most reported factor contributing to anxiety and depressive symptoms for white and BIPOC respondents alike, as well as for pregnant and postpartum respondents. Inability to access medical care can make it difficult to ensure the family is getting their health needs met. One research study found first antenatal visits dropped 26% during COVID-19.⁶ Listening session participants explained that the difficulty getting to medical care online goes back to the need for internet connectivity and phone/texting minutes, while the difficulty getting to medical care in-person was just that providers were not seeing in-person patients during COVID-19 or transportation difficulty. Two participants in one listening session mentioned the difficulty in getting needed medical care was related to families not understanding the process for scheduling follow-up visits after a virtual appointment; something that was traditionally done in the office after a physical visit to the doctor.

In addition, experiencing a hardship, including a job loss or financial instability, was the most commonly reported factor contributing to symptoms of anxiety and depression among those with a household income less than \$75,000 annually and among 18–25-year-olds. The need for accurate COVID-19 information, as perceived by LHD listening session participants, is also evident in the WTE data where parents report the availability of data and information on COVID-19 vaccines for children as a very important factor in deciding whether or not to vaccinate their children.

Example of Different Responses to One MCH Issue – Supporting Breastfeeding

The issue about breastfeeding education highlighted the vastly different approaches LHDs took during their COVID-19 response to meet the needs of their MCH population during the listening sessions. Some LHDs stopped their breastfeeding program (small LHD group & mid-sized LHD group) because lactation consultants were deployed to the COVID-19 response or could not reach new mothers due to COVID-19 restrictions. *“We were not able to capture [mothers who just gave birth] as much and because I wasn’t able to go to the hospitals like I was previously, I wasn’t able to catch them early on, so it was a lot of just people giving up [on breastfeeding] because what’s the point?”* (Small LHD group). According to [NACCHO’s 2020 Forces of Change survey](#), 60% of LHDs reduced their provision of MCH services during COVID-19 and 43% reassigned MCH staff from their regular duties to perform duties in support of COVID-19 response.⁷

One participant said she really regretted her decision to move from breastfeeding education to the COVID-19 response. As she explained, *“Can we talk about the perfect time to help people with breastfeeding when they have to be at home with their kids all the time? It’s like the perfect time for it”* (mid-sized LHD group). This belief that the lockdown made it easier to breastfeed was supported by participants whose breastfeeding programs continued. *“I saw a lot of families who were still breastfeeding past one [year] because they were able to be home with their babies and to kind of be more present and not stress about pumping and things that normally would have been an issue. So, I feel like there was some success in areas . . . [that] didn’t do well in the past, they were doing really well because they were able to be home . . .”* (small LHD group).

Participants in the listening sessions also differed on the delivery methods for breastfeeding support – in-person, virtual, and hybrid. One small LHD group participant said she met in-person with the mothers at the health department after hours when no one else was there so the mothers felt secure. Others said they referred their community members to community breastfeeding support groups for in-person breastfeeding support. Virtual one-on-one breastfeeding support was yet another approach to provide support to new mothers during COVID-19. This approach was mentioned by participants in the small LHD and large LHD listening sessions. One participant in the large LHD listening session talked about a hybrid approach she used. *“Moms that I would talk to, we would do a [video call]. [If] they’re still having issues, I would then call Black Mother’s Breastfeeding Association. . . and I was able to just directly send the moms there ASAP. . . sending them to these various places so that things could stay in good standing with breastfeeding and them feeding their child, them not becoming depressed because they can’t breastfeed their child, things like that it’s a lifesaver, lifeline.”*

Finally, one participant said their team was inspired to create an app to help deliver breastfeeding education *“. . . thinking outside the box and how could we continue to deliver services, but in a different manner. . . [our LHD] created a virtual lactation app that we use, and many families have utilized”* (small LHD group). While there were some issues with the app, launching and using it during COVID-19 was helpful, and this LHD continued breastfeeding support.

The range of responses around this one issue highlights that dedicated individuals will find different solutions to serving their communities in a crisis. It is an important reminder that there is not a one-size-fits-all response. There may be a benefit in bringing together LHDs to discuss their approaches so professionals from different regions can think through the issue of service delivery together.





Community Partnerships

In the listening sessions, a frequently mentioned approach to addressing the needs of the MCH population was working with community organizations. Small LHDs relied more heavily on community agencies, while participants in the mid-sized and larger LHD groups may have tapped more into government-supported agencies. Small/rural agencies are therefore encouraged to leverage partnerships with community agencies to help disseminate COVID-19 data and information to their MCH population who, according to WTE needs assessment data, are less likely to trust federal agencies, local public health or news media as reliable sources of such information. Larger LHDs are likely to have more success disseminating information through public health agencies and other government channels. According to one participant in the large LHD listening session, the city was helpful in disseminating vaccine information and dispelling myths. *“The city really tried to make sure everybody [had access to the COVID-19 vaccine] . . . and they’re still listening and hearing, ‘Oh, we didn’t get here, we didn’t do this, okay we’re coming’. . . we offered vaccine information sessions where our clients could ask whatever myths they thought, questions they had, and we had an expert come in and just talk to them . . .”* (Large LHD group)

Mental Health Needs

Concerns related to client mental health needs were persistent across listening sessions, even for questions not directly related to mental health. The mental health needs specifically identified were substance use, child neglect, social isolation and postpartum depression, and depression in general. Listening session participants stated they tried to identify mental health needs by asking questions when delivering public health services (e.g., PHQ-9 screen for depression). They then made referrals to mental health programs, helped families overcome barriers (e.g., insurance coverage, technology needs) or ensured LHD services such as substance use treatment and need exchanges continued throughout COVID-19.

Listening Session Findings on Negative Perception of LHD Response

One concern that came up at least once in the listening session is the negative public perception of the public health COVID-19 response. *“I also feel like community response . . . which I have to say one of the impacts for me and rural public health and a small place where everybody knows each other, is that the divisiveness over the issue of the pandemic and how to do things to help curve it are very violent here. It’s very, it’s very polarized. We’ve had our health officer threatened. She’s also a single mother, fairly young position. . . . So it’s not been easy”* (small LHD group). This did not come up often in the listening sessions, but stories of this type of response are widespread in the media. According to [NACCHO’s 2020 Forces of Change survey](#), 41% of LHDs have had health officers/agency leadership receive direct threats to their or their family’s physical safety, and 14% of LHDs have staff that experienced these threats.⁷ This aligns with WTEP data which shows participants from rural areas are less likely to trust federal agencies, local public health, and news media as reliable sources of information regarding COVID-19 vaccines for children.

Listening Session Findings on the Needs of Public Health Staff

Although the listening session participants were not directly asked about their own needs, it emerged as a common theme. The biggest concern was being deployed to the COVID-19 response and, as a result, not working on their programs and with their populations as usual. In some cases, this meant stopping program activities (e.g., car seat programs, breastfeeding programs, MCH programs) or limiting their usual services to clients, even if the MCH program was not officially closed. *“That’s what I ended up doing. I ended up running the hotline instead of being a lactation consultant. So, I was not helping people, not in the way I’m used to”* (mid-sized LHD group). Minimizing the MCH programs increased the stress of the MCH staff. A few respondents mentioned that they took it upon themselves to do their MCH work in addition to the COVID-19 work, often after hours. *“Lactation never went away, I was one of the only people that never missed a day and was going 15 days straight at times and it didn’t matter if I was going to see that person at seven o’clock at night because I was still at work, working on contact tracing and I was going to meet them when nobody else was in the health department so that they felt secure.”* (small LHD group). A few participants provided insight into why public health programs and program staff were treated differently. These included statutory requirements and perceived impact on the population when prioritizing programs and services that would continue as usual during the LHD’s COVID-19 response.

Research has begun highlighting that the COVID-19 pandemic has had an unprecedented impact on the mental health and well-being of public health workers⁸ resulting in anxiety, depression, burnout, and poor physical health.⁹ When our listening session participants were asked “what one word would you use to describe how you felt as you were supporting pregnant and postpartum people during the pandemic?” more than half of words provided were negative (purple) (Figure 14). Overwhelmed was mentioned a total of three times and by two groups.

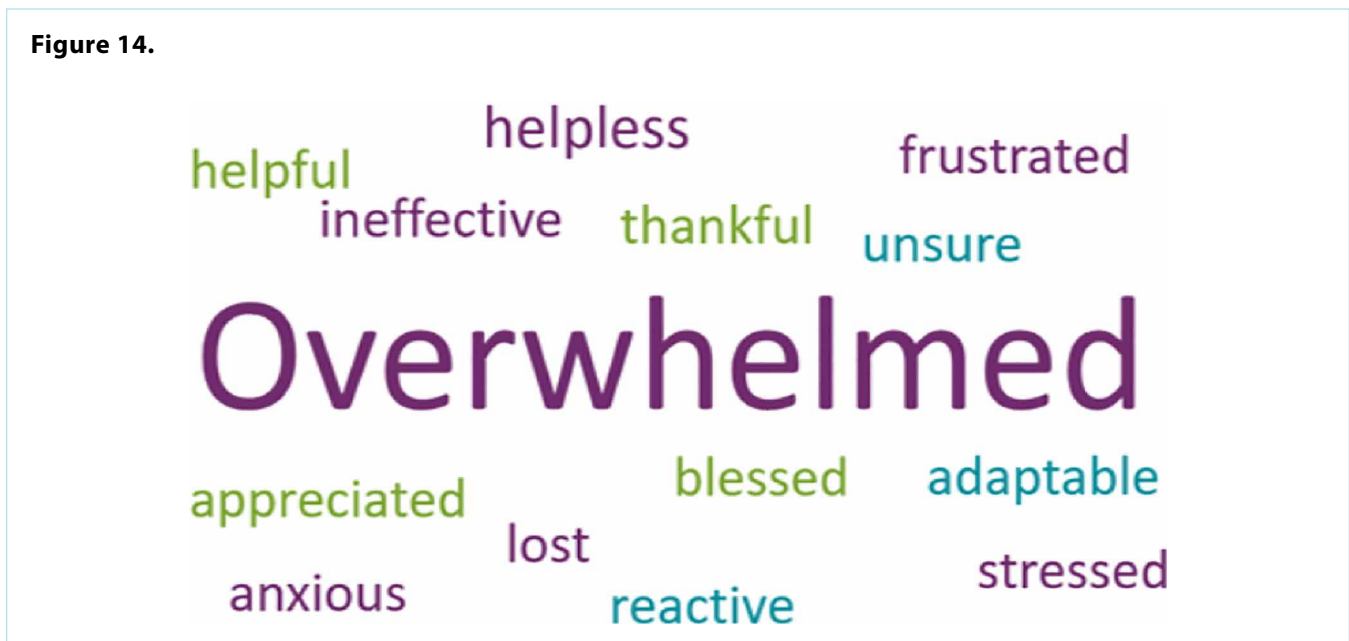


Figure 14: Word cloud showing the one-word listening session participants used to describe how they felt while supporting pregnant and postpartum people during the pandemic. (PURPLE font indicates negative connotation, GREEN font indicates positive, and BLUE reflects neutral terms)

DISCUSSION

The needs assessments and listening sessions assessed health-seeking behaviors of pregnant and postpartum people faced with an unprecedented pandemic, and to understand LHD staffs' perspectives on needs among this population during COVID-19.

The three needs assessments were distributed between March-August 2021, about one year after the start of the worldwide pandemic. The strictest COVID-19 protocol counter measures (e.g. lockdowns) had been mostly lifted in the United States, vaccines started becoming available for pregnant people and the general public ages 18 and over, and vaccines for children were on the way.

Although the needs assessments aimed to assess the health-seeking behaviors of pregnant and postpartum people during the pandemic, many people in this population were not autonomous in their decision-making. Health decisions were mainly dependent on COVID-19 protocols and the availability of medical staff, maternal health care providers and reproductive health services. For example, some responded that they became pregnant because they were unable to access contraceptives during this time. On the contrary, others had to delay family planning because IUD removal appointments were not deemed an emergency service. Furthermore, some COVID-19 protocols, and availability of services were dependent on state policies.

Within this sample, we found that duress and distress levels were a focal point for this population during the pandemic. Both pregnant and postpartum people experienced increased levels of duress and distress during the pandemic. Job loss or decrease in pay contributed to a

higher duress level. Additionally, pregnant and postpartum people indicated high levels of anxiety because of the pandemic. For both pregnant and postpartum people, duress and distress levels varied greatly among racial and ethnic groups. However, BIPOC, other races, and Hispanics are more likely to experience duress (threats, violence, constraints) during the pandemic. This falls in line with other studies in the field that show BIPOC communities are more adversely impacted by the pandemic, such as their increased likelihood of losing employment during the pandemic.^{10,11} These findings should encourage detection and appropriate management of mental health for this population, with a specific focus to better support the BIPOC community.

Among the LHD staff that participated in the listening sessions, there are many lessons from the LHDs' response to COVID-19 that can be adapted for future public health threats and emergencies, including when public health programs lose funding or governmental agencies must make difficult decisions about program prioritization inclusive of population health and equity. While LHD staff identified their commitment to serving their MCH communities despite being deployed to the COVID-19 response, this commitment yielded longer work hours, increased physical and mental stress, and burnout. It is vital to support MCH providers in avoiding compassion fatigue and burnout, especially during a public health crisis. Furthermore, the identified lessons learned can inform a response to a pandemic or local public health crisis and any situation that calls for the reorganization of staff in a way that threatens MCH programming.



CONCLUSION & RECOMMENDATIONS

COVID-19 has impacted people in a multitude of ways. In addition to social isolation, the pandemic has brought about a variety of stressors for pregnant individuals. Many pregnant and postpartum people reported challenges accessing mental health care services and disruptions to their prenatal and/or postpartum care.

Furthermore, LHDs have been on the front lines of the COVID-19 pandemic since the beginning, and throughout, they have remained a constant source of information and resources to keep communities safe and informed. While LHD staff identified their commitment to serving their MCH communities despite being deployed to the COVID-19 response, this commitment yielded longer work hours, increased physical and mental stress, and burnout. In July of 2021, CDC [released results of a survey](#) of more than 26,000 state, tribal, local, and territorial public health workers. That survey found that 53% of respondents reported symptoms of at least one mental health condition in the past two weeks, including depression (32%), anxiety (30%), PTSD (36%), or suicidal ideation (8%). It is vital to support MCH providers in avoiding compassion fatigue and burnout, especially during a public health crisis.

As LHDs continue to play a pivotal role in supporting pregnant and postpartum people access services and resources, it is critical for local health officials to:

Support Vaccination for Pregnant People and Children

- Promote vaccination to all people, especially pregnant people, in addition to the co-administration of the COVID-19 vaccine, influenza, and other vaccines, when appropriate.
- Use [CDC's COVID-19 Vaccines While Pregnant or Breastfeeding](#) guidance and [ACOG's COVID-19 Pregnancy and Breastfeeding: A Message for Patients](#) FAQs to help plan and promote the COVID-19 vaccine in your community.
- Collaborate with pre/postnatal care providers, including Doula, IBCLCS; community partners, news media outlets, and other trusted messengers to share available data on this population and the COVID-19 vaccine and provide messaging related to the effectiveness and safety of the vaccines for pregnant and postpartum people
- Prioritize pregnant and postpartum people who belong to BIPOC communities, non-English speaking communities, and rural communities.
- Use CDC's [Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States](#) and ACOG's [COVID-19 Vaccination Considerations for Obstetric–Gynecologic Care](#) to help plan and promote the COVID-19 vaccine in your community.

Support the Mental Health Needs of Pregnant and Postpartum People

- Utilize CDC's [HEAR HER](#) campaign resources and tools to recognize maternal warning signs during and after pregnancy and improve communication between clients and their healthcare providers.
- Encourage, promote, and communicate the importance of attending all prenatal and postpartum care visits (whether in person or hybrid) as important opportunities for mental health referrals.

Support the Needs of LHD Staff

- Recognize the mental health needs of LHD staff and identify practices that support the well-being of staff. Review [NACCHO's Public Health Resiliency Library](#).

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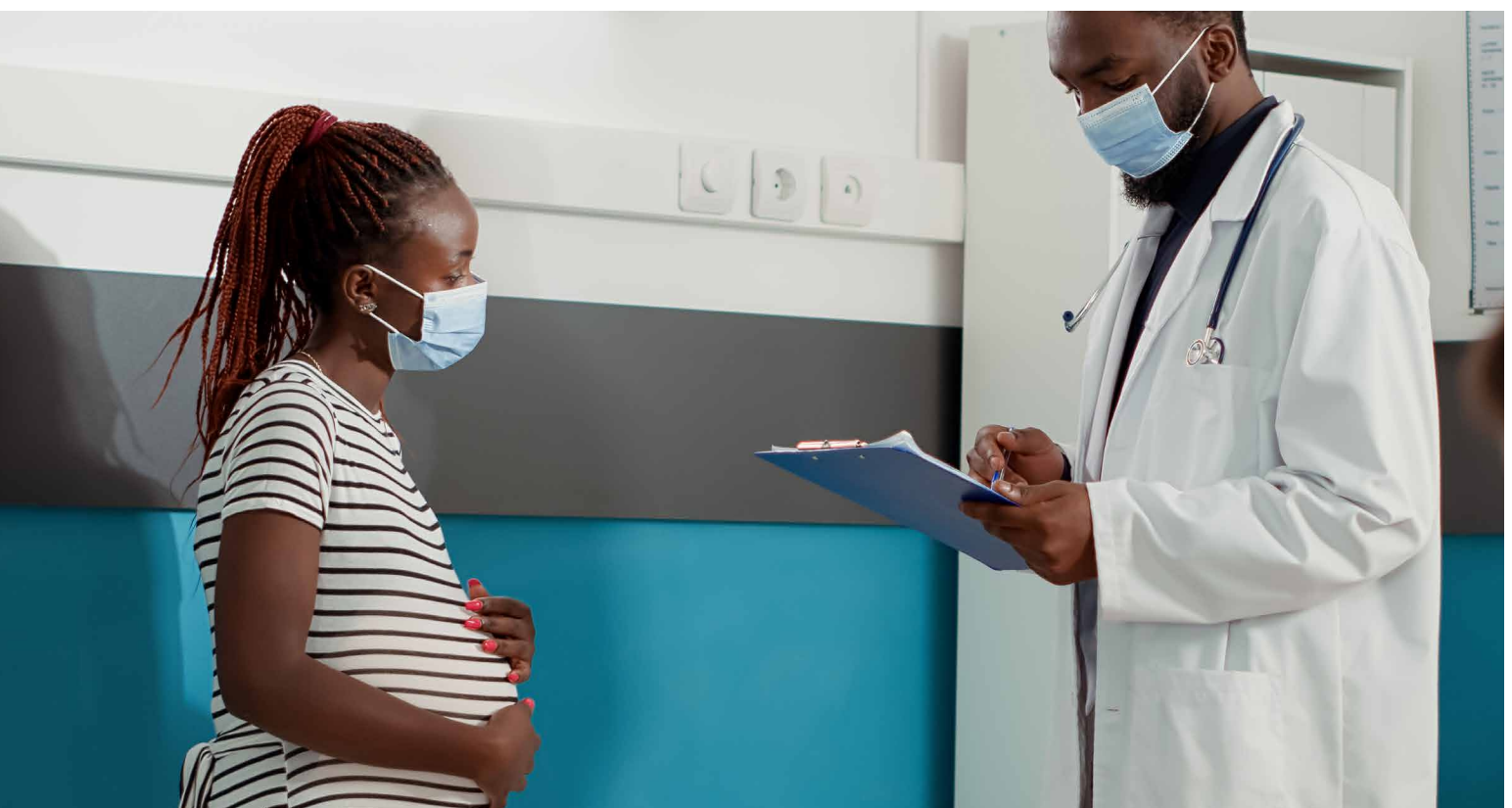
Thank you to all of the LHD staff for volunteering their time to participate in the listening sessions to understand LHD perspectives on needs among pregnant and postpartum persons and parents of young children during COVID-19. Thank you for your commitment and dedication to protecting the health of your community and for taking the time to share your experiences.

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REFERENCES

1. COVID Data Tracker. [Vaccinations Among Pregnant People](#). (accessed January 27, 2022)
2. COVID Data Tracker. [Demographic Characteristics of People Receiving COVID-19 Vaccinations in the United States](#). (accessed January 27, 2022)
3. *Center for Epidemiologic Studies Depression Scale (CES-D)*. (n.d.). Retrieved January 27, 2022, from <https://www.apa.org/depression-guideline/epidemiologic-studies-scale.pdf>
4. Spitzer, R. L., Williams, J. B. W., Kroenke, K., et al. (n.d.). *Generalized anxiety disorder 7-item (GAD-7)*. National HIV Curriculum. Retrieved January 27, 2022, from <https://www.hiv.uw.edu/page/mental-health-screening/gad-7>
5. QSR International Pty Ltd. (2020) NVivo (released in March 2020), <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>
6. Das Neves Martins Pires, P.H., Macaringue, C., Abdirazak, A. et al. Covid-19 pandemic impact on maternal and child health services access in Nampula, Mozambique: a mixed methods research. *BMC Health Serv Res* 21, 860 (2021). <https://doi.org/10.1186/s12913-021-06878-3>
7. 2020 Forces of Change Survey. NACCHO Retrieved May 4, 2022 from https://www.naccho.org/uploads/downloadable-resources/2020-Forces-of-Change-The-COVID-19-Edition.pdf?utm_campaign=2020+FOC+report
8. Sovold, L.E et al. (May 7, 2021). Prioritizing the mental health and well-being of healthcare workers: An urgent global public health priority. *Frontiers in Public Health*. <https://doi.org/10.3389/fpubh.2021.679397>
9. Stone, K. W., Kintziger, K. W., Jagger, M. A., & Horney, J. A. (2021). Public Health Workforce Burnout in the COVID-19 Response in the U.S. *International journal of environmental research and public health*, 18(8), 4369. <https://doi.org/10.3390/ijerph18084369>
10. Robert Wood Johnson Foundation, Harvard T.H. Chan School of Public Health, NPR. The Impact of Coronavirus on Households, By Race/Ethnicity. (September 2020). <https://www.rwjf.org/en/library/research/2020/09/the-impact-of-coronavirus-on-households-across-america.html>
11. KFF (Kaiser Family Foundation), Racial Disparities in COVID-19: Key Findings from Available Data and Analysis. (Accessed March 1, 2022) Retrieved from: <https://www.kff.org/report-section/racial-disparities-in-covid-19-key-findings-from-available-data-and-analysis-issue-brief/>

APPENDIX

- [Listening Session Report](#)
- [Infographics](#)

ABBREVIATIONS

- CDC: Centers for Disease Control and Prevention
- NACCHO: National Association of County and City Health Officials
- WTEP: What to Expect Project
- MMWR: Mortality and Morbidity Weekly Report
- LHD: Local Health Department
- CPHI: Center for Public Health Innovation
- MCH: Maternal and Child Health
- ACOG: American College of Obstetricians and Gynecologists
- SMFM: Society for Maternal-Fetal Medicine
- ACIP: Advisory Committee on Immunization Practices

¹ COVID Data Tracker. [Vaccinations Among Pregnant People](#). (accessed May 4, 2022)

² COVID Data Tracker. [Demographic Characteristics of People Receiving COVID-19 Vaccinations in the United States](#). (accessed May 4, 2022)

³ *Center for Epidemiologic Studies Depression Scale (CES-D)*. (n.d.). Retrieved January 27, 2022, from <https://www.apa.org/depression-guideline/epidemiologic-studies-scale.pdf>

⁴ Spitzer, R. L., Williams, J. B. W., Kroenke, K., et al. (n.d.). *Generalized anxiety disorder 7-item (GAD-7)*. National HIV Curriculum. Retrieved January 27, 2022, from <https://www.hiv.uw.edu/page/mental-health-screening/gad-7>

⁵ QSR International Pty Ltd. (2020) NVivo (released in March 2020), <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>

⁶ das Neves Martins Pires, P.H., Macaringue, C., Abdirazak, A. et al. Covid-19 pandemic impact on maternal and child health services access in Nampula, Mozambique: a mixed methods research. *BMC Health Serv Res* 21, 860 (2021). <https://doi.org/10.1186/s12913-021-06878-3>

⁷ NACCHO. 2020 Forces of Change: The COVID-19 Edition. (accessed May 4, 2022)

⁸ Sovold, L.E et al. (May 7, 2021). Prioritizing the mental health and well-being of healthcare workers: An urgent global public health priority. *Frontiers in Public Health*. <https://doi.org/10.3389/fpubh.2021.679397>

⁹ Stone, K. W., Kintziger, K. W., Jagger, M. A., & Horney, J. A. (2021). Public Health Workforce Burnout in the COVID-19 Response in the U.S. *International journal of environmental research and public health*, 18(8), 4369. <https://doi.org/10.3390/ijerph18084369>

¹⁰ The Impact of Coronavirus on Households, by race/ethnicity. Robert Wood Johnson Foundation

¹¹ Racial Disparities in COVID-19: Key Findings from Available Data and Analysis. Kaiser Foundation.