Experiences navigating the pregnancy care continuum during the COVID-19 pandemic

Elana F. Jaffe, MPH, Natalie C. Spach, MD, MPH, Kristen A. Sullivan, PhD, MSW, MBA, Anne D. Lyerly, MD, MA, Ilona T. Goldfarb, MD, MPH

PII: S1049-3867(22)00136-0

DOI: https://doi.org/10.1016/j.whi.2022.11.002

Reference: WHI 6893

To appear in: *Women's Health Issues*

Received Date: 8 April 2022

Revised Date: 2 November 2022

Accepted Date: 3 November 2022

Please cite this article as: Jaffe E.F., Spach N.C., Sullivan K.A., Lyerly A.D. & Goldfarb I.T., Experiences navigating the pregnancy care continuum during the COVID-19 pandemic, *Women's Health Issues* (2022), doi: https://doi.org/10.1016/j.whi.2022.11.002.

Experiences navigating the pregnancy care continuum during the COVID-19 pandemic

Elana F. Jaffe, MPH,[a,b] Natalie C. Spach, MD, MPH,[a,b] Kristen A. Sullivan, PhD, MSW, MBA[a,c] Anne D. Lyerly, MD, MA,[a,c] Ilona T. Goldfarb, MD, MPH[d]

a. University of North Carolina School of Medicine, 321 S Columbia St, Chapel Hill, NC 27599

b. University of North Carolina Gillings School of Global Public Health, 135 Dauer Dr, Chapel Hill, NC 27599

c. Center for Bioethics, Department of Social Medicine, University of North Carolina at Chapel Hill, 333 S Columbia, Chapel Hill, NC 27599

d. Department of Obstetrics and Gynecology, Massachusetts General Hospital, 55 Fruit Street, Boston, MA 02114

Key words: pregnancy, labor and delivery, postpartum, coronavirus pandemic, COVID-19

Acknowledgements: The principal investigator (ITG) had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author emails:

elana_jaffe@med.unc.edu; natalie_spach@med.unc.edu; ksullivan@med.unc.edu; alyerly@email.unc.edu; igoldfarb@mgh.harvard.edu

ABSTRACT:

Introduction: The COVID-19 pandemic led to unprecedented changes in care delivery across the pregnancy care continuum. Our primary objective with this research was to characterize the range of ways that the early months of the COVID-19 pandemic impacted pregnancy, childbirth, and postpartum care experiences.

Methods: Pregnant and recently pregnant patients (n=20) from obstetrics and gynecology clinical sites associated with Massachusetts General Hospital were interviewed about their experiences with prenatal care, childbirth, and postpartum care during the first wave of the COVID-19 pandemic. Interview transcripts were analyzed for emergent themes.

Results: This sample included 20 pregnant and postpartum people, including 11 individuals who tested positive for COVID-19 during pregnancy or postpartum and 9 with suspected infection. The ways in which COVID-19 or suspected COVID-19 impacted experiences of prenatal care, childbirth, and postpartum care were complex and varied. Three themes were identified across narratives of pregnancy, birth, and postpartum care: patient perceptions of diminished access to care, stigma due to COVID-19 infection, and limited capacity of providers to honor patient preferences.

Conclusions: A better understanding of pregnant and recently pregnant people's experiences during the early months of the COVID-19 pandemic can inform infection control policies and clinical care delivery practices that are more congruent with the needs and values of pregnant, birthing, and postpartum people as institutions craft responses to future pandemics. Approaches that maximize meaningful access across the pregnancy care continuum, center patients' priorities within adapted care models, and honor patient preferences as much as possible are important aspects of an appropriate response to future waves of COVID-19 and other pandemics.

INTRODUCTION

Access to and engagement with the healthcare system are of heightened importance during pregnancy and childbirth, but the COVID-19 pandemic significantly disrupted care delivery in obstetrics and across medicine. During the initial response to the pandemic when relatively little was known about the virus, patients and providers faced immense uncertainty about a possibly increased risk from COVID-19 infection during pregnancy as well as the potential for vertical transmission and unknown long-term impacts for the developing fetus. Concern about bringing pregnant people and their families to the same locations serving COVID-19 patients and potentially exposing them to the virus added complexity to the provision of maternity care.

Hospitals and clinics rapidly responded to minimize opportunities for viral transmission at the point-of-care and implemented strict infection control policies for prenatal care visits, births, and postpartum appointments. Some hospitals converted prenatal visits to telemedicine appointments or restricted patients from bringing children, partners, or other supportive companions to their care visits (Stuebe 2020). Policies restricting visitors during childbirth were implemented; some institutions allowed no support person for the birthing individual and others allowed one companion (Arora, Mauch, & Gibson, 2020). Many institutions switched from in-person postpartum visits to telehealth appointments (Fryer, Delgado, Foti, Reid, & Marshall, 2020). Throughout the initial wave of the pandemic, public health and professional organizations offered conflicting and sometimes unclear recommendations regarding separation of newborns from mothers with COVID-19.

We sought to understand the ways in which the initial wave of the COVID-19 pandemic — and institutional responses to it — impacted experiences of care during pregnancy, childbirth,

and the postpartum period from the standpoint of childbearing persons. In the first wave of the pandemic, infection control policies were rapidly emerging and evolving, data on risk to pregnant people was limited, and effective vaccines were not available. During this time, we conducted qualitative interviews with pregnant and recently pregnant people to explore the impact of the pandemic and initial infection control policies on patient experiences across the pregnancy care continuum. Findings may help to inform obstetric care adaptations when considering the evolving COVID-19 pandemic and future infectious disease outbreaks.

METHODS

The data for this analysis were collected between April 2020 and August 2020. This study was approved by the Partners Institutional Review Board (IRB) at Massachusetts General Hospital (MGH).

Sample:

We utilized a cross-sectional, convenience sampling approach. All MGH patients with confirmed or suspected COVID-19 infection or exposure to COVID-19 infection are designated patients under investigation (PUI) and entered into a clinical database for regular follow-up with clinic staff to track COVID-19 related symptoms and recovery. English-speaking pregnant or recently pregnant patients between the ages of 18 and 45 on this clinic list were offered participation in this study by MGH clinical staff during clinical follow-up calls. The interview guide was developed with experts in qualitative research methods, obstetrics, and public health.

Process:

All participants provided verbal informed consent. A member of the study team (EJ) conducted semi-structured, in-depth qualitative interviews in English over the phone, asking participants a series of questions about their experiences of COVID-19 symptoms and testing, prenatal care, birth, postpartum care, and breastfeeding (Figure 1) (Guest, Namey, & Mitchell, 2013). Participants provided socio-demographic information at the end of the interview. Interviews lasted approximately one hour and were recorded and transcribed verbatim.

Analysis:

Codebook development was an iterative process, incorporating both a priori codes generated from the interview guide questions as well as inductive codes that were identified when reviewing and discussing the data. Once the codebook was finalized, we coded transcripts with NVivo 12 software. To ensure inter-rater reliability, two members of the study team (EJ and NS) double-coded four transcripts (20%) and resolved discrepancies through discussion. From this analysis, we identified emergent themes that were salient across participant experiences of care (Guest, MacQueen, & Namey, 2012). Findings around participants' daily lives, support systems, household stress and safety, emotional health, and coping mechanisms are reported elsewhere (Spach et al. 2022).

RESULTS

Participants:

Participants ranged in age from 28 to 49 years, with an average age of 34.5 years. The majority of participants were married and had private health insurance (Table 1). Participants varied across gestational age, gravidity, self-described race and ethnicity, and education level.

COVID-19 Characteristics and Experiences:

Eleven participants tested positive for COVID-19, and nine were deemed persons under investigation (PUI). Of the PUI, six were symptomatic but untested given limited test availability and eligibility during the first wave of the pandemic, and the three who tested negative were either symptomatic for COVID-19 illness or had an exposure to a person with known COVID-19 (Table 2). Among those who tested positive for COVID-19, one participant was asymptomatic, while others experienced a range of symptoms from mild illness to critical conditions requiring hospitalization.

Experiences of Care during Pregnancy, Childbirth, and Postpartum:

Three intersecting themes emerged across participant experiences of care during pregnancy, childbirth, and the postpartum period. First, participants described diminished access to care, including cancelled prenatal care appointments, perceived limitations on ability to seek vaginal births, and restricted access to postpartum contraception and consultation. Second, participants relayed how ambiguity about policies led to unclear – and ultimately unmet – expectations about care experiences. Stark disjuncts emerged between the way care during pregnancy, birth, and the postpartum period were "supposed to be" and the ways in which these experiences were disrupted by COVID-19 infection or infection control policies. Instead, participants described ways in which hospital staff were unable to honor their preferences, though many acknowledged that providers were limited by operating within pandemic response policies. Third, participants identified instances of feeling stigmatized while pregnant, giving birth, or postpartum, due to COVID-19 infection or infection control policies.

Decreased access to care

Among pregnant participants with confirmed or suspected COVID-19 infection, clinics cancelling in-person appointments were a source of significant distress, as were long delays between appointments. Some participants perceived their in-person prenatal appointments to be postponed indefinitely.

"They cancelled all my appointments when they found out I had it…So that made my anxiety even more worse because I don't know…what was going on with the baby."

— Kiara, 34, Black, COVID-19 positive, 2nd trimester

Participants expressed concern about impacts of cancelled in-person prenatal care appointments, and fewer ultrasounds meant less reassurance about fetal development.

"I know I'm fine and the baby is fine, but I just want to see it. Seeing is believing."

— Brianna, 32, Black, COVID-19 positive, 3rd trimester

Several participants experienced prolonged COVID-19 illness, which further delayed their access to prenatal care. One participant was instructed to monitor the pregnancy at home, and expressed concern that without medical expertise, it would be impossible to tell if something went wrong.

"I'm tracking her movements and my blood pressure, but I'm not [a] doctor, I hope I'm doing it right."

— Dina, 30, White, PUI tested negative, 3rd trimester

Even for participants who did not test positive for the coronavirus, scheduling changes due to COVID-19 infection control practices at the hospital extended the number of weeks (and in one

case several months) between in-person appointments, and the delay prompted anxiety and concern.

Perceived limitations on access to care also impacted perceptions of care quality. For all ambulatory patients across disciplines with suspected or confirmed COVID-19 infection, care appointments were delayed when appropriate or shifted to a specifically designated COVID-19 clinical site within the hospital. For some, this translated to perceived compromises in the quality of prenatal care. For instance, while obstetric providers and ultrasound equipment were available in these COVID-19 units, a patient-facing ultrasound screen was not. Some participants described a diminished ultrasound experience in non-obstetric units where the sonograms were not visible to the pregnant person.

"I didn't receive the same kind of care that I would have if I didn't have the coronavirus."

— Amelia, 35, White, COVID positive, postpartum

Other participants did not perceive differences in care quality relative to before the pandemic.

"The quality of care has still been very high…I am being taken good care of…if I had any concerns, if something came up tomorrow, I feel like I don't have any hesitation about calling."

— Emma, 37, White, PUI not tested, 3rd trimester

As appointments moved online, participants reflected on the quality of telehealth care: most agreed that provider kindness and attention to their needs was not impacted. One participant acknowledged the comfort of talking to their provider on the phone:

"It makes you feel like somebody cares. [It] feels like, 'Okay, I'm with you. I just can't see you, but I'm with you.'"

— Brianna, 32, Black, COVID positive, 3rd trimester

Others described that telehealth did not offer the same reassurance about how their pregnancies were progressing.

"It's not the same as having them hear the heartbeat and measure my stomach…I don't think it gives you the same validation."

— Dina, 30, White, PUI tested negative, 3rd trimester

Factors that increased distress among participants who were not able to access in-person prenatal care included past experiences of adverse pregnancy outcomes and known exposures to COVID-19. One participant with two recent prior miscarriages experienced bleeding in the first trimester of the current pregnancy; ultrasound appointments to assess the viability of the pregnancy were cancelled and rescheduled multiple times due to suspected COVID-19 infection.

Participants hospitalized for severe COVID-19 also perceived inadequate pregnancy-focused care.

"I was admitted into the hospital. And I was only 11 weeks pregnant when it had happened. And they couldn't send somebody down, like an ultrasound tech, to give me an ultrasound because of the precautions of the coronavirus. So it was just scary."

— Ava, 34, White, PUI not tested, 2nd trimester

Despite expressing trust in providers, participants still felt concerned about issues for which clinicians were not able to offer reassurance, especially the impact of COVID-19 infection on the fetus and potential long-term effects. Additionally, one participant discussed how her racial identity intersected with her perceived risk of harm from COVID-19.

"I'm African American…It just changes the way I think about everything in terms of just general health…it's like everything always impacts you differently just because of your, just because you're Black."

— *Keisha, 35, Black/African American, COVID-19 positive, 2nd trimester*

After birth, intrapartum care experiences were also impacted. Several participants described being offered hospital discharge sooner than ordinarily would have been standard before COVID-19. They described the difficulty in making a decision between limiting perceived COVID-19 exposure in the hospital and limiting access to immediate care in the early postpartum period. Of note, one participant reported being denied planned surgical sterilization postpartum due to a new hospital policy limiting elective procedures during the initial surge of the pandemic.

"*I wanted to get my tubes tied after the birth, but they said due to the virus, they weren't able to do it for me. I would have to wait...I wish they would just do it anyways. So I don't have to worry about it after."*

— *Selina, 33, Latina, COVID-19 positive, postpartum*

Participants reported entirely virtual postpartum care visits. Some felt that virtual visits were less reassuring than an in-person visit for assuaging concern about recovery from childbirth:

"*I had a second-degree tear and just feel like that's something before the doctor says 'go back to working out like normal or having sex,' that seems like something that they would want to look at."*

— *Larissa, 38, White, COVID-19 positive, postpartum*

Participants described not seeking in-person care for a range of postpartum conditions from umbilical hernia to mastitis due to their own concerns and wishes to avoid the hospital environment. Others expressed a desire for in-person postpartum care in order to receive support for breastfeeding, also expressing that they may have been more likely to seek lactation consultant services in the hospital if not for the pandemic.

Limited capacity to honor patient preferences

When participants did access care, they described ways in which infection control policies limited provider capacity to honor their preferences and meet their expectations.

For example, the policy requiring pregnant individuals to attend prenatal care alone was in direct conflict with their preferences and expectations.

"*My boyfriend — he couldn't be there for all my ultrasounds. It feels kind of like — it sucks, cause this is my first baby so like all the experiences you're supposed to have with your partner, and you have to do it on your own."*

— *Rosa, 31, Latina, PUI not tested, 2nd trimester*

For others, this was not only disappointing but a source of stress, particularly for those who had to find COVID-19-safe childcare for the duration of their appointments rather than bringing their children to appointments.

All participants, but especially those who experienced COVID-19 symptoms or tested positive for COVID-19 on admission or during labor, faced unanticipated changes in their birth plans in ways that they felt did not honor their preferences. One participant experienced an elevated temperature and labored with full COVID-19 precautions and personal protective equipment; ultimately, she had negative test results.

"This is not the way it should have been. It kind of took away from my experience."

— *Christine, 38, White, PUI tested negative, postpartum*

Multiparous participants compared giving birth during COVID-19 to past pre-pandemic experiences, describing the birth as emotionally less intimate and physically more difficult, due

to either COVID-19 symptoms or COVID-19 infection control policies, such as wearing a mask during labor.

In many cases, COVID-19 not only impacted the birth experience but the planning for birth, limiting pregnant people's ability to choose — to the extent that they may have been able to pre-pandemic — where and with whom they desired to give birth. While patients we interviewed were permitted a support person in the delivery room per institutional policies, several participants expressed worry that they would labor and give birth alone.

"I'm just not looking forward to going into have the baby by myself, but I hear they're not letting anybody going with the women in labor."

— Viola, 35, Black, PUI tested negative, 2nd trimester

For several participants, the context of COVID-19 raised questions about birth place. Despite concern about risk of COVID-19 exposure in the hospital, most participants interviewed perceived hospital or birthing center births to be the safer option compared to home births. However, one participant was asked by her mother to plan a home birth so that her mother and her partner could attend the birth.

In the postpartum period, expectations around newborn bonding were deeply impacted by infant separation policies and confusion around changes in and implementation of this policy. Many participants had anticipated seeing the infant immediately after childbirth as a joyful and important moment, making separation policies particularly painful, and source of perceived injustice.

"I felt like my — my rights were being violated. You know, I felt like they couldn't tell me that I couldn't hold my own kid."

— Amelia, 35, White, COVID positive, postpartum

Participants also expressed concern that COVID-19 policies may impact bonding with their newborn. For example, doctors recommended one participant keep a mask on around the newborn for multiple weeks after birth, which caused excess distress:

"I realized 10 days in that that I actually hadn't kissed my son."

— Kayla, 43, White, COVID-19 positive, postpartum

Perceived Stigma

Beyond unmet expectations, multiple participants perceived stigma related to COVID-19 infection and policies during pregnancy, birth, and the postpartum period. One participant described the psychosocial costs of being quarantined while pregnant:

"[P]eople think you're like spreading something, that — well it is — it is uncomfortable and it is scary but it makes you feel unwanted, depressed, scared, worried and anxious."

— Kiara, 34, Black, COVID-19 positive, 2nd trimester

The separation of care for pregnant patients with COVID-19 was also perceived as stigmatizing, even if the reasons for separation were understood and acknowledged.

"There was a lot of: 'Don't come in, you can't go with regular people, this is going to be you in a separate room and everyone else is going to be gowned up and super careful touching you.'"

— Isabella, 41, White, COVID-19 positive, 3rd trimester

Interviewed participants who gave birth while infected with COVID-19 also reported perceived stigma while laboring.

"You feel like everybody's like looking at you like, stay away, like you have the plague…it felt like kind of like I have the plague because nobody wanted to come into my room.

Because they were all afraid…There were times where I was hungry and I wouldn't be able to do anything, because they weren't coming into the room."

— Selina, 33, Latina, COVID-19 positive, postpartum

Others experienced stigma when interfacing with intrapartum and postpartum care. Participants described policies to limit maternal exposure to the infant, such as disallowing skin-to-skin contact, recommending newborn separation, and placing restrictions on breastfeeding like asking people to wash their breasts before each feed or have the infant be wrapped fully in a blanket during the feed.

"They usually do skin-to-skin right away and I wasn't allowed to have any of that…the only time I could touch her was breastfeeding but she had to be wrapped up."

— Christine, 38, White, PUI tested negative, postpartum

Others described how the practices differed by providers,

"There was one nurse who bought a face cloth…and tried to tell me that I had to wash my breast…I'm not going to wash myself every time I have to breastfeed my kid…that same nurse, every time she came into the room, even in the middle of the night, she would move the bassinet six feet away from me on the other side of the room."

— Amelia, 35, White, COVID positive, postpartum

In addition to the emotional burden caused by these policies, participants worried about how they would provide care and nutrition for and bond with their newborns if they were advised against being near them.

DISCUSSION

In our study, three overarching themes characterized participant narratives of the pregnancy care continuum during the initial months of the COVID-19 pandemic: (1) perceptions of decreased access to care, (2) a limited capacity for the health system to honor patient preferences, and (3) feeling stigmatized in healthcare settings. Our data highlights the ways in which COVID-19 infection control policies uniquely impact obstetrical care and place particular burdens on pregnant, birthing, and postpartum people.

Consistent with recent literature describing pregnant people's challenges navigating care during the initial wave of the pandemic in the U.S., our data highlight the costs of precautionary policies (Altman et al. 2021; Bayrampour et al. 2022; Combellick et al. 2022; Javaid et al. 2021; Kolker et al. 2021). Similar to findings reported by Dove-Medows et al., decreased access to prenatal "rites of passage" caused distress, anxiety, and sadness for participants, and was viewed as one important way that infection control policies limited the capacity for providers to honor patient preferences (Dove-Medows et al. 2022). There is certainly utility to switching some appointment types — e.g., medication management, psychotherapy — to virtual visits during the pandemic, but our data emphasize the high value placed by patients on in-person services such as prenatal ultrasounds and postpartum physical exams. Our findings are consistent with data describing the experiences of low-income postpartum patients with delays in care and drawbacks of virtual care (Gomez-Roas et al. 2022). Although we are now more than two years into the COVID-19 pandemic, the first few months of future crises may similarly challenge health care delivery. Our findings emphasize the importance of appropriate access to respectful, in-person services even while health systems adapt to pandemic contexts.

Our study adds the troubling finding that pregnant and birthing people experienced perceived stigma due to COVID-19. Several participants in this study reported feeling

"unwanted," feared, and unwelcome in the space where they were to give birth. Participants expressed some anger at their experiences of stigma, but predominantly the stigmatization was isolating and disparaging. Instructions to wash breasts prior to breastfeeding, not hold infants skin-to-skin, wear masks around infants, or keep infants on the other side of the hospital room meant that participants were attempting to reconcile conflicting information about how to provide the best care for their infants. Stigma around maternal infection and blame for ensuing fetal/infant risk has adversely impacted the pregnancy and birthing experiences of many individuals living with infectious diseases, including HIV, Zika Virus, and Ebola Virus (Zorrilla et al. 2016; Strong and Schwartz 2019). Such stigma also fits into the broader concerning trope of "mother-blame," the trend of attributing fetal or infant harm only to maternal behavior without considering external factors (Richardson et al. 2014).

One limitation of this study is that data were collected during the first COVID-19 wave in a city with high caseloads and must be contextualized as such; personal protective equipment and COVID-19 tests were in short supply and institutions all over the country were rapidly developing new policies. At the time of data collection, limited available information suggested an increased risk of severe COVID-19 infection, hospitalization, and invasive ventilation during pregnancy (Ellington et al., 2020). Additional data has since emerged clarifying the increased maternal morbidity and mortality, as well as adverse pregnancy outcomes, associated with COVID-19 infection during pregnancy (McClymont et al. 2022; Chmielewska et al. 2021).

IMPLICATIONS FOR POLICY AND PRACTICE

Our findings carry several implications for infection control policies and clinical practice that may shift throughout the COVID-19 pandemic and future infectious disease outbreaks. First,

findings highlight the opportunity to employ creative ways to meet the needs of pregnant, birthing, and postpartum people, such as using technology to accommodate additional support people into care visits or childbirth. Our data reflect the chaotic scramble of most health institutions to pivot in care delivery while navigating inadequate capacity for increased patient loads and uncertainty about risk, modes of transmission, and the long-term impact of the virus itself. In the time since these data were collected, clear guidance that is more aligned with the care needs expressed by our participants has been issued that recommends, for example, not requiring asymptomatic testing at onset of labor, promoting shared decision-making processes around maternal/infant separation after birth, and utilizing technology to allow additional support persons to be a part of the birthing process (ACOG 2022; CDC 2022). However, recommendations remain in place for increased utilization of telehealth, face-coverings during labor and when interacting with the infant, limitations on birthing companions, and physical distancing from the infant after birth. Institutional preparedness efforts readying for future outbreaks may benefit from a focus on clear communication around care delivery changes and creative ways of utilizing technology to ensure that even when patients must physically navigate care alone, they can receive consistent virtual support. Additionally, interventions to reduce stigma related to infectious disease in health-care settings are effective, and future efforts to adapt care in the face of emerging pathogens may take important lessons from ongoing work investigating ways to reduce HIV-related stigma in the prenatal care context (Stangl et al. 2013; O'Brien et al. 2017). While necessary infection control policies may limit the capacity of providers and the health system more broadly to honor patient preferences, acknowledging the difficulty of these restrictions for patients may mitigate some of their disappointment and

validate their experiences of being pregnant, birthing, and going through the postpartum period during a pandemic.

Finally, inequitable impacts of limited capacity to accommodate patient preference should be further investigated. For example, the shift to only virtual postpartum visits must be contextualized by racial disparities in maternal mortality and the fact that one in three pregnancy-related deaths occurs between one week and one year postpartum (Petersen, Davis, Goodman, Cox, Mayes, et al. 2019; Petersen, Davis, Goodman, Cox, Syverson, et al. 2019). Similarly, the perception of a Latina participant in our study of being denied access to postpartum sterilization echoes a long and problematic history of reproductive coercion in marginalized communities. Participant concern regarding elevated risk from COVID-19 infection due to racial identity is consistent with how the pandemic has both highlighted and compounded racial disparities in access to care, social determinants of health, and health outcomes both within and outside of the obstetrics context. As infection control policies shift, COVID-19 vaccination uptake waxes and wanes, and future variants or novel pathogens emerge, it is critical for institutions and providers to clearly and continuously examine, justify, and communicate changes to prenatal, birth, and postpartum care policies.

CONCLUSION

A better understanding of pregnant and recently pregnant people's experiences during the early months of the COVID-19 pandemic may lead to infection control policies and clinical care delivery practices that are more congruent with the needs and values of pregnant, birthing, and postpartum people as institutions craft responses to future pandemics. Recommendations to ensure meaningful access across the pregnancy care continuum, center patients' priorities within

adapted care models, and promote patient dignity and honor patient preferences during prenatal, birth, and postpartum care are important aspects of any response to COVID-19 and future pandemics.

References

Altman, M. R., Gavin, A. R., Eagen-Torkko, M. K., Kantrowitz-Gordon, I., Khosa, R. M., & Mohammed, S. A. (2021). Where the system failed: The covid-19 pandemic's impact on pregnancy and birth care. *Global Qualitative Nursing Research*, *8*, 23333936211006396. https://doi.org/10.1177/23333936211006397

ACOG. American College of Obstetricians and Gynecologists COVID-19 FAQs for obstetricians-gynecologists, obstetrics. Washington, DC: ACOG; 2020. Available at: Https://www.acog.org/clinical-information/physician-faqs/covid-19-faqs-for-ob-gyns-obstetrics. Retrieved [6/21/2022].

Arora, K. S., Mauch, J. T., & Gibson, K. S. (2020). Labor and delivery visitor policies during the COVID-19 pandemic: Balancing risks and benefits. *JAMA*, *323*(24), 2468–2469. https://doi.org/10.1001/jama.2020.7563

Bayrampour, H., Tamana, S. K., & Boutin, A. (2022). Pregnant people's responses to the COVID-19 pandemic: A mixed-methods, descriptive study. *CMAJ Open*, *10*(1), E146–E154. https://doi.org/10.9778/cmajo.20210136

CDC. (2022, March 3). *Pregnant and recently pregnant people*. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/pregnant-people.html

Chmielewska, B., Barratt, I., Townsend, R., Kalafat, E., van der Meulen, J., Gurol-Urganci, I., O'Brien, P., Morris, E., Draycott, T., Thangaratinam, S., Le Doare, K., Ladhani, S., von Dadelszen, P., Magee, L., & Khalil, A. (2021). Effects of the COVID-19 pandemic on maternal and perinatal outcomes: A systematic review and meta-analysis. *The Lancet. Global Health*, *9*(6), e759–e772. https://doi.org/10.1016/S2214-109X(21)00079-6

Combellick, J. L., Basile Ibrahim, B., Julien, T., Scharer, K., Jackson, K., & Powell Kennedy, H. (2022). Birth during the Covid-19 pandemic: What childbearing people in the United States needed to achieve a positive birth experience. *Birth (Berkeley, Calif.)*, *49*(2), 341–351. https://doi.org/10.1111/birt.12616

Dove-Medows, E., Davis, J., McCracken, L., Lebo, L., Misra, D. P., Giurgescu, C., & Kavanaugh, K. (2022). A mixed-methods study of experiences during pregnancy among black women during the COVID-19 pandemic. *The Journal of Perinatal & Neonatal Nursing*, *36*(2), 161–172. https://doi.org/10.1097/JPN.0000000000000622

Ellington, S., Strid, P., Tong, V. T., Woodworth, K., Galang, R. R., Zambrano, L. D., Nahabedian, J., Anderson, K., & Gilboa, S. M. (2020). Characteristics of women of reproductive age with laboratory-confirmed SARS-COV-2 infection by pregnancy status—United States, January 22-June 7, 2020. *MMWR. Morbidity and Mortality Weekly Report*, *69*(25), 769–775. https://doi.org/10.15585/mmwr.mm6925a1

Fryer, K., Delgado, A., Foti, T., Reid, C. N., & Marshall, J. (2020). Implementation of obstetric telehealth during COVID-19 and beyond. *Maternal and Child Health Journal*, *24*(9), 1104–1110. https://doi.org/10.1007/s10995-020-02967-7

Gomez-Roas, M. V., Davis, K. M., Leziak, K., Jackson, J., Williams, B. R., Feinglass, J. M., Grobman, W. A., & Yee, L. M. (2022). Postpartum during a pandemic: Challenges of low-income individuals with healthcare interactions during COVID-19. *PloS One*, *17*(5), e0268698. https://doi.org/10.1371/journal.pone.0268698

Guest, G., MacQueen, K., & Namey, E. (2012). *Applied thematic analysis*. SAGE Publications, Inc. https://doi.org/10.4135/9781483384436

Guest, G., Namey, E. E., & Mitchell, M. L. (2013). *Collecting qualitative data: A field manual for applied research*. SAGE Publications, Ltd. https://doi.org/10.4135/9781506374680

Javaid, S., Barringer, S., Compton, S. D., Kaselitz, E., Muzik, M., & Moyer, C. A. (2021). The impact of COVID-19 on prenatal care in the United States: Qualitative analysis from a survey of 2519 pregnant women. *Midwifery*, *98*, 102991. https://doi.org/10.1016/j.midw.2021.102991

Kolker, S., Biringer, A., Bytautas, J., Blumenfeld, H., Kukan, S., & Carroll, J. C. (2021). Pregnant during the COVID-19 pandemic: An exploration of patients' lived experiences. *BMC Pregnancy and Childbirth*, *21*(1), 851. https://doi.org/10.1186/s12884-021-04337-9

McClymont, E., Albert, A. Y., Alton, G. D., Boucoiran, I., Castillo, E., Fell, D. B., Kuret, V., Poliquin, V., Reeve, T., Scott, H., Sprague, A. E., Carson, G., Cassell, K., Crane, J., Elwood, C., Joynt, C., Murphy, P., Murphy-Kaulbeck, L., Saunders, S., … CANCOVID-Preg Team. (2022). Association of SARS-COV-2 infection during pregnancy with maternal and perinatal outcomes. *JAMA*, *327*(20), 1983–1991. https://doi.org/10.1001/jama.2022.5906

O'Brien, N., Greene, S., Carter, A., Lewis, J., Nicholson, V., Kwaramba, G., Ménard, B., Kaufman, E., Ennabil, N., Andersson, N., Loutfy, M., de Pokomandy, A., Kaida, A., & CHIWOS Research Team. (2017). Envisioning women-centered HIV care: Perspectives from women living with HIV in Canada. *Women's Health Issues: Official Publication of the Jacobs Institute of Women's Health*, *27*(6), 721–730. https://doi.org/10.1016/j.whi.2017.08.001

Richardson, S. S., Daniels, C. R., Gillman, M. W., Golden, J., Kukla, R., Kuzawa, C., & Rich-Edwards, J. (2014). Society: Don't blame the mothers. *Nature*, *512*(7513), 131–132. https://doi.org/10.1038/512131a

Spach, N. C., Jaffe, E. F., Sullivan, K. A., Feltner, C., Lyerly, A. D., & Goldfarb, I. T. (2022). Emotional experiences of pregnant and postpartum people with confirmed or suspected COVID-19 infection during the initial surge of the pandemic. *Women's Health Reports (New Rochelle, N.Y.)*, *3*(1), 405–413. https://doi.org/10.1089/whr.2021.0143

Stangl, A. L., Lloyd, J. K., Brady, L. M., Holland, C. E., & Baral, S. (2013). A systematic review of interventions to reduce HIV-related stigma and discrimination from 2002 to 2013: How far have we come? *Journal of the International AIDS Society*, *16*(3 Suppl 2), 18734. https://doi.org/10.7448/IAS.16.3.18734

Strong, A. E., & Schwartz, D. A. (2019). Effects of the West African Ebola epidemic on health care of pregnant women: Stigmatization with and without infection. In D. A. Schwartz, J. N. Anoko, & S. A. Abramowitz (Eds.), *Pregnant in the Time of Ebola* (pp. 11–30). Springer International Publishing. https://doi.org/10.1007/978-3-319-97637-2_2

Stuebe, A. (2020). Should infants be separated from mothers with COVID-19? First, Do No Harm. *Breastfeeding Medicine: The Official Journal of the Academy of Breastfeeding Medicine*, *15*(5), 351–352. https://doi.org/10.1089/bfm.2020.29153.ams

Zorrilla, C. D., Mosquera, A. M., Rabionet, S., & Rivera-Viñas, J. (2016). HIV and zika in pregnancy: Parallel stories and new challenges. *Obstetrics & Gynecology International Journal*, *5*(6), 180. https://doi.org/10.15406/ogij.2016.05.00180

Table 1. Demographic information

Characteristic		N	%
Age	Mean (+/- SD)	35.6 (+/-5)	
Self-described race	Black	4	20%
and ethnicity	Latina	3	15%
	White	13	65%
Gestational age	1st Trimester	1	5%
	2nd Trimester	7	35%
	3rd Trimester	6	30%
	Postpartum	6	30%
Gravida	Primigravida	8	40%
	Multigravida	12	60%
Education	High School/GED/Associate Degree	7	35%
	Bachelors	8	40%
	Masters	5	25%
Employment	>1 full or part time job	2	10%
	1 full or part time job	13	65%
	Unemployed	5	25%
Insurance	Through own/partner employment	15	75%
	Medicaid (MassHealth)	5	25%
Marital status	Married	16	80%

Table 2. COVID-19 Symptoms & Status

COVID status	N	%
Tested positive	11	55%
Suspected COVID-19 infection: tested negative	3	15%
Suspected COVID-19 infection: not tested/ unknown test result	6	30%

Figure 1. Standard In-depth Interview Questions

SECTION 1: PREGNANCY HISTORY	I'm going to start out with a few questions about your pregnancy. 1. Are you currently pregnant? IF YES: when is your due date? IF NO: can you tell me when you delivered? 2. Do you have other children?
SECTION 2: COVID STATUS	1. Coronavirus has affected our lives in many ways. Can you tell me about how it's been for you as a [PREGNANT OR POSTPARTUM] person during this outbreak? Probe: what has been most challenging for you? What are you most worried about? Probe: your health, baby's health, access to healthcare, birth experience? 2. **COVID Test:** Have you ever been tested for coronavirus? IF YES: Have you gotten your results yet? If yes, what was your result? IF NO: did you talk to your doctor about coronavirus related symptoms? 3. **COVID symptoms:** IF COVID + or PUI (Yes to test or yes to symptoms): Could you describe any coronavirus related symptoms you have experienced? IF YES SYMPTOMS: How long did your symptoms last? What have you been doing to relieve these symptoms? IF COVID – Would you say you are worried about the coronavirus? Was there ever a time that you thought that you had coronavirus? IF YES: Could you tell me about that time and what made you think that?
SECTION 3: IMPACT ON PHYSICAL HEALTH AND ACCESS TO CARE	1. **Underlying conditions:** Do you have any underlying medical conditions, e.g. diabetes, hypertension, anxiety, depression? IF YES: Does coronavirus change how you have thought about your [condition] during pregnancy? 2. **Access to care:** How has coronavirus impacted your access to healthcare, such as how often you talk to your doctor? IF PREGNANT: Specifically, have you continued to receive prenatal care and talk to your pregnancy provider? Are these visits more or less frequent than before? Are they different? IF POSTPARTUM: can you tell me about your contact with your healthcare provider since delivery? 3. **Childbirth/parenting preparedness:** Did coronavirus change how prepared you feel/felt for giving birth? Were you taking childbirth/parenting/breastfeeding lessons? If so, how did these change? 4. **Delivery:** IF PREGNANT: Can you tell me about your plans for delivery? How has coronavirus changed your delivery plans?

	Probe: who you planned to have in the delivery room before coronavirus, if/how that has changed. IF POSTPARTUM: Can you tell me about your delivery experience? How did coronavirus change your delivery? Probe: who was in the room, where you delivered and gave birth, medication 5. **Postpartum quarantine for COVID+:** IF POSTPARTUM AND COVID+ or PUI: Due to changing CDC recommendations, some people may be separated from their babies after birth. Did you experience this? IF YES: Can you tell me about what happened and what this was like for you? 6. **Breastfeeding:** IF PREGNANT: Do you plan to breastfeed? Was this plan changed by coronavirus? IF POSTPARTUM: Are you currently or do you plan to breastfeed? Was this impacted by coronavirus?

Elana Jaffe MPH (she/hers) is a second year medical student at the University of North Carolina School of Medicine and a graduate research assistant in the Department of Social Medicine.

Natalie Spach MD, MPH (she/hers) graduated from University of North Carolina School of Medicine in 2022 and is a resident physician in Obstetrics and Gynecology at Stanford University.

Kristen A. Sullivan, PhD, MSW, MBA (she/hers) is a Research Scientist in the Department of Social Medicine at the University of North Carolina at Chapel Hill.

Anne D. Lyerly, MD, MA (she/hers) is a Professor of Social Medicine and Research Professor of Obstetrics and Gynecology at the University of North Carolina at Chapel Hill.

Ilona T. Goldfarb, MD, MPH (she/hers) is a board-certified maternal fetal medicine specialist at the Massachusetts General Hospital and an Assistant Professor in Obstetrics, Gynecology, and Reproductive Biology at Harvard Medical School.