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Pregnant in the United States in the COVID-19 pandemic: A collision of crises we cannot ignore

Pamela Stratton, Elena Gorodetsky, Janine Clayton

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Abstract: NO abstract intended, Introduction is listed here The COVID-19 pandemic and call for social justice is occurring when the United States, unlike its peer countries, has already experienced a steady 20-year rise in maternal morbidity and mortality with pregnant women today facing a 50 percent higher risk of mortality than their mothers. 1 Most vulnerable are women of color, black and American Indian/Alaska Native women, who have experienced longstanding disparities in access to and quality of healthcare and may begin pregnancy with hypertension, diabetes, and obesity, complications known to be more common in women enduring segregation. 2-4 Initially, the race-related health disparities and resultant disproportionately higher rates of COVID-19 cases and mortality in indigenous communities and black, latinx, or other communities of color were mistakenly considered innate racial differences. More recently, these higher rates have been attributed to underlying social, structural, and environmental determinants of health including resource inequities, inadequate housing, and occupational and environmental hazards that result in greater exposure to and less protection from COVID-19. 5,6 Augmented by the added physiologic stress of pregnancy, these comorbidities and disparities compound the risk of pregnancy-associated cardiomyopathy, thromboembolism, and hemorrhage, often resulting in lasting physical and mental health consequences.

Keywords: Maternal morbidity and mortality ■ Social justice ■ COVID-19 pandemic ■ Racial disparities ■ Medical comorbidities

Author affiliations: Pamela Stratton Scientific Consulting Group, Inc., Gaithersburg, MD, United States; Office of the Clinical Director, Intramural Research Program, National Institute of Neurological Disorders and Stroke, Bethesda, MD, United States; Elena Gorodetsky Office of Research on Women's Health, National Institutes of Health, Bethesda, MD, United States; Janine Clayton Office of Research on Women's Health, National Institutes of Health, Bethesda, MD, United States

Corresponding author at: National Institutes of Health, Building 10, Room 7-4647, 10 Center Dr. Bldg 10, room 7-4647, Bethesda 20892, MD, United States.email: strattop@mail.nih.gov

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The COVID-19 pandemic and call for social justice is occurring when the United States, unlike its peer countries, has already experienced a steady 20-year rise in maternal morbidity and mortality with pregnant women today facing a 50 percent higher risk of mortality than their mothers.¹ Most vulnerable are women of color, black and American Indian/Alaska Native women, who have experienced longstanding disparities in access to and quality of healthcare and may begin pregnancy with hypertension, diabetes, and obesity, complications known to be more common in women enduring segregation.²⁻⁴ Initially, the race-related health disparities and resultant disproportionately higher rates of COVID-19 cases and mortality in

indigenous communities and black, latinx, or other communities of color were mistakenly considered innate racial differences. More recently, these higher rates have been attributed to underlying social, structural, and environmental determinants of health including resource inequities, inadequate housing, and occupational and environmental hazards that result in greater exposure to and less protection from COVID-19.^{5,6} Augmented by the added physiologic stress of pregnancy, these comorbidities and disparities compound the risk of pregnancy-associated cardiomyopathy, thromboembolism, and hemorrhage, often resulting in lasting physical and mental health consequences.^{7,8}

Structural healthcare and sociocultural disparities perpetuate and magnify these risks for women of color and indigenous communities.^{3,9} For example, in “obstetric deserts” (some urban centers and half of the rural counties without obstetrical delivery services or obstetricians), pregnant women lack nearby, basic healthcare to address common comorbidities.^{10,11} In these obstetric deserts, typically areas of racial and ethnic residential segregation, nearly half of childbearing women rely on Medicaid for maternity coverage.^{12,13} Women gain coverage only after becoming pregnant and lose Medicaid about 2 months after giving birth. Medicaid disproportionately pays for a greater share of births in latinx, black and indigenous women, rural areas, young women under age 19, and those with lower levels of educational attainment.¹⁴ These pregnancy disparities constitute a form of structural racism and worsen maternal outcomes.^{12,15}

National efforts began to address these disturbing maternal mortality rates by coupling state-led maternal mortality surveillance to interventions targeted to reduce maternal morbidity, often using resources created by the Alliance for Innovation on Maternal Health.^{11,16} While such efforts decreased maternal morbidity in California, they did not reduce overall race-related disparities there.¹⁷ Importantly, a recent large-scale quality improvement collaborative has significantly reduced racial disparities in severe maternal morbidity from hemorrhage.¹⁸ Last spring, the National Institutes of Health (NIH) sought research applications to develop evidence and improve understanding of the biological, behavioral, sociocultural, and struc-

tural factors contributing to maternal morbidity and mortality, recently awarding about \$7.2 million in grant supplements to projects supported by institutes across NIH. This work is the foundation for the Implementing a Maternal health and PRegnancy Outcomes Vision for Everyone (IMPROVE) initiative.¹⁹

The increasing maternal mortality rate constitutes an alarm that calls for increased attention to the health of all reproductive aged women. Nationally, women are in poorer health before they become pregnant and increased female mortality rates in over 40% of US counties (compared to 4% for males) portend declining health of American women.^{20,21} The COVID-19 pandemic has exposed health system fault lines leading to circumstances where an emerging infection risks decimating the most vulnerable, especially pregnant women.^{22,23} In short, this deadly, unpredictable infectious disease has demonstrated just how precarious US community health is and why public health should be of concern to everyone. Highest case fatality ratios are observed among older, obese, hypertensive, and diabetic adults (men > women), with individuals of color most at risk.²⁴⁻²⁷ Women represent the majority of essential workers, especially in healthcare and face additional, disproportionate burdens caregiving and coordinating distance learning on top of domestic duties, compromising their resilience and mental health.²⁸⁻³⁰ Many endured the stress of job loss, domestic violence, or risk experiencing homelessness.^{31,32}

Maternal morbidity and mortality from COVID-19 appears less severe than observed in MERS and SARS-Cov-1.^{33,34} COVID-19-infected pregnant and nonpregnant reproductive-aged women in the United States have similarly low mortality rates.^{35,36} However, infected pregnant women are more likely to be hospitalized, admitted to intensive care, intubated, receive extracorporeal membrane oxygenation, and die with women of color and indigenous communities most affected.³⁶ Compared to those who gave birth without COVID-19, infected women experienced a considerably higher risk of in-hospital death, thrombotic events, preterm birth and preeclampsia, with the highest risk experienced by black and latinx women.³⁷ Whether these higher rates are due to lack or avoidance of in-person prenatal care, effects of racial or ethnic bias in care, complications of COVID-19 infection or known higher rates of these complications arising in obese black and indigenous women is not known. Long-term symptoms have been reported by COVID-19-infected individuals with young women around age 40 and no relevant medical history more affected (sex ratio 4:1) than men.^{38,39} Whether COVID-19 infection during pregnancy or postpartum poses a greater risk of acute complications like stroke or long-term complications like

myofascial pain syndrome or chronic fatigue syndrome in women is unknown and underscores the need to follow women for up to a year postpartum. Initially, most pregnant women with COVID-19 in Asia gave birth by cesarean section (C-section) to lessen the maternal-fetal transmission risk and optimize maternal health.⁴⁰ Women have suffered mid-trimester losses and given birth to preterm, growth-restricted infants, unsurprising given inflammatory, thrombotic changes reported in placentas from infected women, signs associated with these outcomes.^{41,42} While vertical transmission is infrequently reported among infected women delivering near term, whether infants born to those infected earlier in pregnancy are at increased risk is unknown.

Worldwide, regional surges requiring testing, hospitalization and care for severely ill individuals disrupted reproductive health services.^{43,44} Women forego visits due to lack of transportation, personal fears of the virus, familial pressure to isolate, and confusion about service delivery.⁴⁵ An estimated 8–39% increase in maternal deaths per month may result from COVID-19-related reductions in prenatal care with predictions of higher rates of maternal morbidity.⁴³ Frequently, even high-risk prenatal visits occur via telehealth which may be unequally distributed to those more affluent.^{46,47} As pregnant women and their providers struggle to ensure maternal-fetal health and safely deliver babies while minimizing risk of infection, universal screening on hospital admission in geographic hotspots showed that many infected pregnant women are asymptomatic.⁴⁸⁻⁵⁰

Unintended consequences for both COVID-19-infected and uninfected women adversely impact the health of mothers and babies. Access to antenatal care resources is limited, care of women and newborns may be disrespectful, and perinatal anxiety, depression, distress and thoughts of self-harm is heightened.^{45,51} Where women test positive or testing is unavailable, infants are sequestered to reduce mother-to-child transmission risk, precipitating severe post-partum depression for some women.⁵² Hospitals limit family and birth attendants during labor, support known to improve maternal outcomes, help ensure quality care and lessen serious complications as well as microaggressions.^{50,53,54} Low-risk candidates for vaginal delivery may undergo C-section intending to improve maternal safety, increasing the complication risk, especially for obese, hypertensive or diabetic women.⁵⁵ Preterm, “elective” C-sections may compromise neonatal health.

During this pandemic, women fearful that they or their newborn become infected during hospital deliveries are seeking alternate birth settings. According to the National Academy of Sciences, Engineering, and Medicine’s report on Birth Settings in America, women want safety,

respectful treatment, and choice among care practices, birth settings and providers.¹⁴ Women may opt for home or birthing center births to avoid microaggressions or racially biased care during a hospital birth, yet these settings are not generally covered by Medicaid.^{56,57} This significant financial barrier to maternal choice, an example of health-care inequity, affects nearly half of the births in America.¹³

Participation in clinical trials, the standard of care for hospitalized nonpregnant COVID-19 patients, has resulted in data-driven interventions and guidelines. Despite rapidly increasing numbers of clinical trials, pregnant women are not consistently included. To date, nearly half of studies have excluded pregnant women and others failed to address pregnancy.⁵⁸ Even without vaccine efficacy or safety data in pregnancy, both the Centers for Disease Control and the American College of Obstetricians and Gynecologists both recommend discussion and shared decision-making for COVID-19 vaccination of pregnant and lactating women.^{59,60} As with other vaccines, we will likely have a pregnancy registry to follow maternal and birth outcomes. Arguably, pregnancy-related changes in drug or vaccine metabolism justify studying pregnant women to guide treatments, dosing, and safety.^{61,62} The gold-standard randomized clinical trial to test therapeutics may not be feasible during pregnancy. Participation of pregnant women in clinical trials increases complexity posing additional scientific considerations and necessitating procedures for monitoring safety.

In 2018, the Task Force on Research Specific to Pregnant Women and Lactating Women (PRGLAC)'s report described obstacles and research recommendations for including these women in clinical studies.⁶³ In 2020, PRGLAC has promulgated implementation plans.⁶⁴ Alternative trial designs that include pregnant and lactating women could be explored.⁶¹

The same intractable factors contributing to substantially higher maternal risks by women of color and indigenous communities may also be fueling disturbing trends in the disproportionate impact of the COVID-19 pandemic in minority communities. These race-related disparities in health and outcomes of COVID+ pregnant women can only be determined with sex, race and ethnicity disaggregated data for pregnancy and health outcomes that include treatments and vaccines.⁶⁵ Whether disease severity, postpartum complications or risk of long-term symptoms is higher among those with pre-existing or gestational comorbidities of hypertension, diabetes and obesity warrants study.³ Racial bias in maternal care during COVID-19 can be investigated through use of clinical checklists prompting providers to act and implicit bias training and education.⁶⁶ Strategies to improve perinatal mental health can be tested.⁶⁶ Investigations into COVID-19-specific issues

during pregnancy including cytokine storm, coagulopathy or elevated lupus anticoagulant are urgently needed to identify and manage potentially life-threatening complications.^{67,68} Research comparing how women engage with reproductive-health services during crises and normal periods can help determine fertility rates or barriers to healthcare.²² Importantly, the fetal origins of disease arising from births during this pandemic, where in utero exposures “program” fetal characteristics that can lead to future disease, proposed by Barker, strongly merits prospective study.⁶⁹

We are at a watershed moment. COVID-19 has unprecedentedly accelerated research collaboration and innovation worldwide, expediting study initiation and research discoveries. Given the collision of the crises of maternal health and the COVID-19 pandemic both disproportionately affecting women of color and indigenous communities, we face an opportunity to consider the health not only of COVID-19-positive pregnant women, but all pregnant women and to tackle intransigent health disparities experienced by underrepresented racial and ethnic populations in the United States by amplifying and building on the IMPROVE initiative.⁷⁰ A pregnant woman delivering a baby cannot opt out of a childbirth experience, but many lack affordable access to high-quality services or research, or experience discrimination during obstetric care. Current circumstances have changed maternity and reproductive healthcare short-term; understanding the consequences of this transformative moment can be leveraged to precipitate long-term improvements in healthcare equity, quality and outcomes for all pregnant women. A strategy focused on the high-risk status conferred by pregnancy that encompasses social determinants of health, addresses structural racism, and seeks to interrupt chronic disease onset and progression within a life-course perspective is sorely needed. We cannot wait.

DECLARATIONS OF COMPETING INTEREST

None.

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