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Commentary

COVID-19 poses alarming pregnancy and postpartum mortality risk in Brazil

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As of April 14, 2021, there have been over 2-9 million COVID-19-related deaths worldwide; a disproportionate number of these are among socially marginalized populations. The combined risk of COVID-19 and pregnancy is a concern, particularly for racial and ethnic groups that experience worse outcomes from both conditions due to upstream social determinants of health and systemic racism. [1]

While early on in the pandemic, pregnancy was not considered a risk factor, research is evolving and recent studies have demonstrated that pregnant people with COVID-19 are at increased risk for adverse outcomes, including death. [2-4] Furthermore, previous research from Brazil showed racial inequalities in maternal mortality, with deaths among Black women documented at almost two times higher than White women as of July 2020. [5] Brazil reported a disproportionately large number of maternal deaths attributed to COVID-19, particularly during the postpartum period. Data from the Brazilian Ministry of Health's Influenza Epidemiological Surveillance Information System (SIVEP-Gripe, publicly available at https://opendatasus. saude.gov.br/dataset/bd-srag-2020), showed that, as of December 6, 2020, there were 160 notified deaths associated with COVID-19 among pregnant and 106 deaths among postpartum hospitalized women (Table 1). Furthermore, when combining pregnant and postpartum deaths, the in-hospital fatality rate was 8.3% (6.7% among White women, and 11.1% among Black women).

These findings are stark in comparison to the U.S. data on hospital deaths, intensive care unit (ICU) admissions, and invasive mechanical ventilation according to limited data presented in a Centers for Disease Control and Prevention (CDC) report (Table 1). [6] Black women fare worse in Brazil and the U.S. than their White counterparts, however, maternal outcomes are overall worse in Brazil regardless of race. In Brazil, racial disparities in maternal mortality existed even

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before the pandemic, where deaths among Black, Brown, and Indigenous women accounted for a disproportionate amount of maternal deaths, [7] and these women also received worse prenatal care. [8]

Brazil's high maternal in-hospital fatality rates need to be mitigated. As demonstrated in Table 1, postpartum women in Brazil with COVID-19 have died at even higher rates than pregnant women, yet this population remains understudied. The high maternal death rates in Brazil are accompanied by large racial, geographic, and socioeconomic disparities. Within Brazil, special attention needs to be given to pregnant and postpartum people and particularly those who are Black, Indigenous, and People of Color. Both upstream social and economic policies, as well as downstream hospital care, would benefit from adopting this contextual lens.

It is important to note that the hospitalized deaths account for only a portion of the impact that COVID-19 will have on maternal mortality. Previous research has demonstrated the number of reported severe acute respiratory illness (SARI) maternal deaths classified as non-defined in the *SIVEP-Gripe* system in 2020 is 1.5 times that of SARI maternal deaths due to all respiratory causes in 2016. [4] Additionally, the data presented in Table 1 does not include maternal deaths among those who do not have COVID-19 but whose care is compromised or limited by overstretched health system capacity. [2] Finally, the mental and physical stress of remaining at home during lockdowns and increased social isolation that occurred in many countries may compromise mental health and increase rates of intimate partner violence. [2]

It is unknown if these trends of postpartum deaths are truly specific to Brazil or if other countries may also be experiencing such alarming outcomes among COVID-19 positive patients. When evidence is sparse, policymaking is compromised. Current understanding of the relationship between COVID-19 and pregnancy is informed by evidence from single- or multi-site studies where pregnancy/postpartum status of cases is reported, with varied quality, and population-level insights cannot be made. Consequently, incomplete data may have contributed to the delay in identifying pregnancy as a risk factor for severe illness with COVID-19. Detailed data availability across a variety of global contexts is imperative, as health systems that do not consistently collect pregnancy and postpartum status on COVID-19 case reports are likely to undercount adverse maternal outcomes.

The United Nations Sustainable Development Goal 3 includes a target of reducing global maternal mortality to less than 70 per

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Table 1Outcomes^a of Black and White pregnant & postpartum women hospitalized with laboratory-confirmed COVID-19 in the U.S. and Brazil^b.

	Total (Black, White, Other, and NR) ^c	Black ^d	White ^d
Postpartum			
Brazil – December 6	n = 685	n = 36	n = 195
Death	106 (15.5%)	10 (27.8%)	28 (14-4%)
ICU Admission	228 (33.3%)	17 (47-2%)	57 (29-2%)
Invasive Ventilation	119 (17-4%)	9 (25.0%)	26 (13.3%)
Pregnant			
Brazil – December 6	n = 2522	n = 146	n = 822
Death	160 (6.3%)	10 (6.9%)	40 (4.9%)
ICU Admission	490 (19-4%)	32 (21.9%)	171 (20.8%)
Invasive Ventilation	178 (7.1%)	11 (7.5%)	54 (6.6%)
U.S. – June 7	n = 2587	n = 461	n = 492
Death	16 (0.6%)	6 (1.3%)	$<5(<1.1\%)^{e}$
ICU Admission	120 (4.6%)	28 (6.1%)	12 (2.4%)
Invasive Ventilation	42 (1.6%)	9 (2.0%)	<5 (<1·1%) ^e
Non-Pregnant/Non-Postpartum			
Brazil – December 6	n = 34,469	n = 1590	n = 13,410
Death	4812 (14.0%)	294 (18.5%)	1554 (11-6%)
ICU Admission	8548 (24.8%)	423 (26-6%)	3440 (25.7%)
Invasive Ventilation	3763 (10.9%)	212 (13.3%)	1406 (10.5%)
U.S. – June 7	n = 4808	n = 1119	n = 803
Death	208 (4.3%)	74 (6.6%)	37 (4.6%)
ICU Admission	757 (15.7%)	194 (17-3%)	158 (19.7%)
Invasive Ventilation	225 (4.7%)	48 (4.3%)	44 (5.5%)

^a These results should be interpreted with caution, due to the high rate of incomplete reporting in the U.S.

100,000 live births by 2030. [9] We are at further risk of not meeting this goal if we fail to identify and mitigate the intersecting effects of COVID-19 and racism on maternal health inequities.

Declaration of Competing Interest

The authors have nothing to disclose.

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For the U.S., we conservatively included data on all deaths (hospitalized or not) because the report did not differentiate between them. [6] We assume that most cases that resulted in death would have been severe enough to be hospitalized. For the denominator, we consider only the cases that were hospitalized. For Brazil, we present only hospitalizations with a recorded outcome (discharged or death). However, data from the U.S. include those missing an outcome (which constitutes almost half of pregnant women and 21% of nonpregnant women, who were assumed to have survived). [6] Missingness of this variable is improving and was reduced to 22% for pregnant women and 17% for nonpregnant women in an updated report released in November. [3] This updated report was not included in the table because although it included the number of deaths, it did not disaggregate cases by hospitalization status, and therefore we were not able to calculate rates comparable with Brazil's inhospital case-fatality. The Centers for Disease Control and Prevention (CDC) indicates as of April 12, 2021, there have been 95 deaths among pregnant women and 14,434 hospitalizations; data were not available to distinguish between hospitalizations indicated by respiratory illness and labor/delivery. [10]

^c NR = not reported. Other race in CDC data includes Hispanic or Latino, Asian non-Hispanic, American Indian, Alaskan Native, Native Hawaiian, and Other Pacific Islander. In Brazil, it includes Indigenous, Brown, and Asian. Comparable information is not widely available in the U.S.

^d For the U.S. data, Black categories represent Black, non-Hispanic and the White category represents, White, non-Hispanic.

^e Cell counts <5 were suppressed.