

Obstetrics

Worldwide maternal deaths due to COVID-19: A brief review

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After initial studies suggested that pregnant women were not at a higher risk of complications due to COVID-19 infection,¹ recent investigations from Sweden and the US have indicated that pregnant and postpartum women are at increased risk of severe complications associated with COVID-19.^{2,3} In an analysis of 8207 cases of COVID-19 in the obstetric population, the Centers For Disease Control and Prevention (CDC) reported a higher risk of ICU admission and mechanical ventilation compared to non-pregnant women, although no higher risk of mortality was identified.³

We searched PubMed/MEDLINE, EMBASE, SciELO and LILACS for documented COVID-19-related maternal deaths from December 2019 until July 1, 2020. After removal of duplicates, our results showed that six countries had reported maternal deaths due to COVID-19 by July 1, 2020: three high-income countries (France, UK, and US)³⁻⁵ and three middle-income countries (Brazil, Iran, and Mexico).⁶⁻⁸ The total number of reported maternal deaths was 160 (Table 1). Twenty-two maternal deaths were documented in high-income countries, and 138 in middle-income countries (124 from Brazil, representing 77.5% of all maternal deaths reported in the literature). It is reasonable to assume that worldwide figures of maternal deaths due to COVID-19 are even higher. We did not identify published cases from low-income countries, which may reflect underreporting rather than absence of cases. The number of deaths, overall and in the obstetric population, is still rising in some countries such as Brazil and the USA, and the time gap between actual events and their reporting in peer-reviewed publications is bound to result in underestimations in literature reviews on COVID-19.

Notably, the combined population size of the three high-income countries reporting maternal deaths is slightly larger than that of the

middle-income countries. Therefore, the incidence of maternal mortality in the latter seems at least six times higher than the figures in high-income countries. As expected, the impact of COVID-19 maternal deaths on the maternal mortality ratio tends to be proportionally higher in countries where such events are less frequent outside of the pandemic context, as seen in the UK.

Comparability of available data is impaired due to methodological differences in studies. For example, Iran⁸ reported critical cases only and denominators differ among other studies, such as mixed-severity hospitalized cases (UK and France),^{4,5} acute respiratory distress syndrome cases (Brazil),⁶ and COVID-19 pregnant women in general (US and Mexico).^{3,7} These preliminary data, however, expose the weaknesses of maternity services in middle-income countries. Mortality among pregnant women diagnosed with COVID-19 in Mexico is 10 times higher than the reported mortality in the US (using similar methods) and France (reporting only hospitalized cases). The same pattern occurs when comparing mortality risk among pregnant women with severe COVID-19 features in Brazil and in France.

Additionally, we identified significant barriers to accessing critical care in Brazil and in Mexico. In Brazil, only 72% of fatal cases among pregnant or postpartum women with COVID-19 were admitted to ICU and 15% of them received no ventilatory support.⁶ In Mexico, only 2 out of 7 women who died were admitted to ICU and received invasive respiratory support. On the other hand, it is worth mentioning that in high-income countries such as the UK and US, black women and women from ethnic minorities were disproportionately affected by severe complications associated with COVID-19.^{3,5}

TABLE 1 COVID-19-related maternal death cases reported in the literature.

Country (First author, year)	Population (2019)	Gini index (World Bank)	Birth rate (per 1000) (2018)	MD per year (2017)	MMR (per 100 000 LB) (2017)	Absolute number of COVID-19 cases		COVID-19 mortality rate among obstetric cases		Expected % increment on yearly MD due to COVID-19	Commentary	
						All severity levels	ARDS or critical cases	Among positive cases	Among ARDS or critical care cases			
Brazil (Takemoto, 2020) ⁶	211 049 527	53.9 (2018)	13.9	1,700	60	N/A	978 (ARDS)	124	N/A	12.7%	7.3%	Database analysis of ARDS COVID-19 cases among pregnant and postpartum women
Iran (Hantoushzadeh, 2020) ⁸	82 913 906	40.8 (2018)	18.8	250	16	N/A	N/A	7	N/A	N/A	2.8%	Case series of near miss and death cases
Mexico (Lumbreras-Marquez, 2020) ⁷	127 575 529	45.4 (2018)	17.6	740	33	308	N/A	7	2.3%	N/A	0.95%	Database analysis of COVID-19 cases among pregnant and postpartum women, regardless of severity
UK (Knight, 2020) ⁵	66 834 405	34.8 (2016)	11.0	52	7	427	41 (Level III critical care)	5	1.2%	12.2%	9.6%	Case series of hospitalized COVID-19 cases among pregnant and postpartum women, regardless of severity
France (Kayem, 2020) ⁴	67 059 887	31.6 (2017)	11.3	56	8	617	128 (respiratory support)	1	0.2%	0.8%	1.8%	Case series of hospitalized COVID-19 cases among pregnant and postpartum women, regardless of severity
USA (Ellington, 2020) ³	328 239 523	41.4 (2016)	11.6	720	19	8207	N/A	16	0.2%	N/A	2.2%	Database analysis of COVID-19 cases among pregnant and postpartum women, regardless of severity

Abbreviations: ARDS, acute respiratory disease syndrome; MD, maternal death; MMR, maternal mortality ratio.

International efforts to reduce maternal mortality have been steadily applied in recent years, including a new global pact through the Sustainable Development Goals (SDG) for 2030.⁹ The COVID-19 pandemic may represent a major obstacle to realizing the SDG by 2030, especially in middle- and low-income countries, where the pandemic seems to be leading to a significant increase in cases of both maternal near miss and mortality.

AUTHOR CONTRIBUTIONS

MNP and MLST equally contributed to study conception and design, data collection, data analysis, and data interpretation. MNP wrote the first draft of the paper and incorporated substantial contributions from CBA, MOM, RK and MLST after critical revision. All authors reviewed and approved the final manuscript.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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Psychological impact of the COVID-19 pandemic among pregnant women in Sri Lanka

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Psychological disturbance among pregnant women is an important health parameter.¹ There is a dearth of studies assessing the

psychological impact of the COVID-19 pandemic on the pregnant population. The present descriptive, cross-sectional study evaluated