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Title: The health, economic, and social effect of COVID-19 and its response on gender and sex: a literature review

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Abstract

Large-scale emergencies, like the ongoing COVID-19 pandemic, demonstrate pervasive effects across multiple sectors. There is a continually growing body of evidence demonstrating gender and sex differences in COVID-19 disease, as well as its health, social, and economic impacts. While online resources have worked to compile this evidence, there is a need to evaluate and synthesize the available gender- and sex-disaggregated data related to COVID-19. This literature review will systematically assess and compile current literature and evidence from different disciplines. We will include peer reviewed articles, clinical studies and reports, and relevant working papers using secondary data analyses and primary research methodologies. We will synthesize and describe the evidence on multiple outcomes of interest, including gender and sex differences in mortality, severity, treatment outcomes, exposure to violence, mental health and psychosocial support needs, and economic insecurity with COVID-19. These results can be used to inform policy, identify research gaps, and support recommendations for priority interventions.

BACKGROUND

Lessons from past disease outbreaks, such as Zika and Ebola, illustrate the importance of incorporating a gender lens into disease response and prevention (1, 2). Public health emergencies can exacerbate existing inequalities and reveal how gender influences the health system and group vulnerabilities related to mortality, exposure, and access to care (3-5). There continues to be a missing gender lens in evidence and

response related to the ongoing COVID-19 pandemic. Gender and sex differences can emerge in both direct consequences of disease (e.g., death, severity, and treatment outcomes) and indirect consequences due to disease response (e.g., loss of income, exposure to violence, and difficulty accessing resources). Understanding how these differ by gender and sex is essential in addressing needs and creating equitable interventions. To this end, it is vital to ensure collection and accessibility of gender- and sex-disaggregated data. Of the available data and literature found across multiple sectors (i.e., health, social, and economic), no one has collectively synthesized this body of evidence on the impacts of COVID-19 by gender and sex.

Research is rapidly emerging on sex and gender differences in relation to COVID-19. Global Health 50/50 is one resource tracking COVID-19 sex-disaggregated data, including mortality and diagnosed cases. While differences in prevalence appear to vary, a higher number of deaths from COVID-19 are occurring in males (6). This difference in mortality may represent sex-based biological differences or gendered differences (e.g., smoking practices) (3). Evidence is still developing on how hospitalizations, severity of disease, and treatment outcomes with COVID-19 differ by sex and gender. Data from Wuhan has suggested that men are at higher risk for severe cases with COVID-19 (7). Empirical evidence has also previously demonstrated that treatment outcomes with immunotherapies differ by sex, with immunotherapy notably being investigated in treatment of COVID-19 as it has been effective in managing infections like SARS-CoV and MERS-CoV in the past (8, 9).

On the other hand, women are at risk of frequent exposure as they make up approximately 70% of the frontline health and social sector workforce (3-5, 10-12). Women providing informal care within households may face additional exposure risk when caring for ill or elderly family members (3, 12, 13). School closures are also expected to impact informal caregivers, where this additional responsibility may result in a loss of income and work outside the home (3). Household economic opportunity can be limited by travel restrictions and stay-at-home orders. As women are disproportionately represented in lower-paid, part-time, and informal work, loss of income may differ by gender due to these restrictive measures (3, 12-15).

Instances of violence, such as gender-based violence (GBV) or intimate partner violence (IPV), typically increase during and after emergencies (3, 5, 13, 17). Cases rise as people experience heightened stress related to economic security and safety, in combination with being isolated due to quarantine or stay-at-home orders (15). Reports of IPV have increased in several countries since responding to COVID-19 (5). France has reported a 30% increase in domestic violence cases since initiating lockdown on March 17th (15), and during the month of February cases in China were three times higher compared to the prior year (18). People experiencing violence will have fewer options for support and additional challenges in access due to COVID-19 restrictions (15, 19). Groups that already report increased occurrence of IPV may be placed at further risk during this crisis. The lifetime risk of IPV for transgender people is estimated at 31-50% (20). COVID-19 may further increase this risk in a community that already has difficulty in accessing help and is underrepresented in data. The emotional, psychological, and physical burdens of a pandemic can negatively impact population wellbeing and increase need for mental health and psychosocial support. However, gendered differences in mortality, exposure to violence, and experiences of frontline health workers may alter the distribution of this burden and need for supportive services (10, 13, 16).

If sexual and reproductive health (SRH) resources are redirected for other emergency measures, this can further restrict access to essential resources (e.g., contraceptives, termination services) (5, 10, 15, 21). This is especially relevant in settings that already have difficulty ensuring these services (14). In past

outbreaks, strained access to SRH care has contributed to increased child and maternal mortality (22). During the 2014-2015 Ebola outbreak, delays in care for pregnancy complications resulted in increased spontaneous abortions and hemorrhaging, among other negative outcomes (14). Supply chains for SRH and other hygiene items (e.g., menstrual health and hygiene management) can also be impeded during pandemics (10, 16). Accessibility of information on disease and prevention can differ by gender, related to literacy, educational attainment, internet access, and cell-phone ownership (12, 16). Rapid surveys from the UN have reported that women in Bangladesh and Pakistan are less likely to receive information about COVID-19 compared to men (16).

There have been many commentaries and perspective pieces on the gendered effects of COVID-19 and its response. Research and data are quickly being generated to inform policies, as well as social and health services, to address these differential impacts. Several online resources, such as the UN Women's Data Hub, Global Health 50/50, Data2X, and the Gender and COVID-19 Working Group from John Hopkins University, have worked to curate data and literature related to gender and sex during this pandemic. However, no collective synthesis of the current data has been done. In this review, we seek to understand available gender- and sex-disaggregated data and integrate current studies on the multisectoral impacts of COVID-19. By compiling and evaluating this information in one resource, we aim to create a resource that can be utilized by multiple disciplines and decisionmakers, periodically updated as evidence emerges, and referenced for insight on future policies and research in promoting health and gender equity.

OBJECTIVE

In this review, we will assess and synthesize currently available literature and data on the gender and sex differences of COVID-19, as well as impacts of this disease and its response measures across multiple outcomes, including health, social, economic, wealth, and education.

In evaluating this body of evidence, we aim to present findings that can be of use across multiple disciplines, identify current gaps in research, and identify priority interventions.

METHODS

Selection Criteria

We will be selecting peer-reviewed publications of secondary data analyses and primary quantitative, qualitative, and mixed methods research. Clinical studies and case reports in peer-reviewed journals on symptoms, treatment response, and hospitalizations will be included if data is gender- or sex-disaggregated. We will not be including studies or reports involving treatment with hydroxychloroquine. Due to the multidisciplinary lens of this review, we will also include published working papers in the selection process. Commentaries and perspective pieces will be excluded.

Publications must be COVID-19 specific and so, based on the timeline of this disease, publications prior to 2019 will be automatically excluded. Studies will not be limited based on language. Participants will consist of individuals of any gender, in all settings and across all ages, with no limitations on location or other demographic information.

Outcomes of Interest

This review will be focusing on the gendered impacts of COVID-19 across health, economic, and social factors. Outcomes of interest include but are not limited to:

- Mortality
- Morbidity
- Risk of disease exposure
- Hospitalization
- Treatment response
- Reproductive health outcomes
- Exposure to violence
- Economic insecurity
- Disruption of education
- Psychosocial and mental health needs

Search Strategy

Our search will be conducted using the following electronic databases: PubMed/Medline, CENTRAL, PsycINFO, and Google Scholar. We will perform a hand search of sex-disaggregated data found in the Global Health 50/50 database, and resources compiled by the Gender and COVID-19 Working Group from John Hopkins University. In addition, we will hand search reference lists from selected studies and systematic reviews identified in our search for other potentially eligible literature. Dates of studies will be constrained to 2019 and onwards based on emergence of COVID-19. Search terms may be modified as the body of evidence on COVID-19 grows (see table 1 for a draft of search terms).

Table 1. Key search terms		
covid-19 or coronavirus or CoV or SARS-CoV-2 or “covid-19 response*” or “coronavirus response*” or “SARS-CoV-2 response*”	AND	sex or gender or wom!n* or m!n* or transgender or male or female or “sex-disaggregated” or “gender-disaggregated” or “gender analys*” or “gender equity” or “health equity”
		“gender-based violence” or GBV or “intimate partner violence” or IPV or “domestic violence”
		“psychosocial” or “mental health” or “stress”
		“treatment” or “symptom*” or “mortality” or “morbidity” “hospitalization” or “clinical management” “clinical outcomes” or “exposure risk”
		“economic securit*” or “economic status” or “income loss” or “income securit*” or “job security*” or “wealth”
		“school closure*” or “education* disruption”

Methods for Selection

Once potential studies are identified from the above search and any duplicate articles are removed, the residual titles and abstracts will be evaluated for relevance to our objective. We will obtain the full-texts of all potentially eligible studies, corresponding with study researchers when necessary. All decisions for selecting or excluding studies will be documented and outlined using a PRISMA diagram.

Data Extraction

Screening and data extraction will be performed by one reviewer, who will consult with a second reviewer based on concerns or deliberations. Disagreements will be resolved through discussion. Any

gender- or sex-disaggregated data related to our outcomes of interest from selected studies will be collected. We will also extract data related to research design, location, participant characteristics, and other key study features.

Assessing Study Quality

Clinical, epidemiological and social science research studies will be evaluated and categorized as high, medium, or low quality based on the following criteria:

1. Clear research question(s)
2. Research methods consistent with standard practices
3. Sample size and justification
4. Appropriate analytic methods to answer research question(s)
5. Recommendations are clearly made based on analysis and findings from study

Studies will be considered high quality if they meet 4-5 of the above criteria, medium quality if they meet 3, and low quality if they meet 2 or less. Clinical case reports and communications will be exempt from quality assessment based on the novel nature of COVID-19.

Data Analysis and Synthesis

We will present outcomes and relevant findings from selected studies using descriptive synthesis, noting common themes and recommendations from included literature. We will also be noting apparent gaps and ongoing needs in research, based on outcomes that are and are not being assessed in the selected articles. Our study limitations include a potential lack of uniformity for included methodology and outcome measures, given the broad nature of our objective.

RESULTS

Proposed Tables and Figures

Figure 1. Outline of study selection for literature review on the health, economic, and social effects of COVID-19 on gender and sex (adapted PRISMA flow diagram)

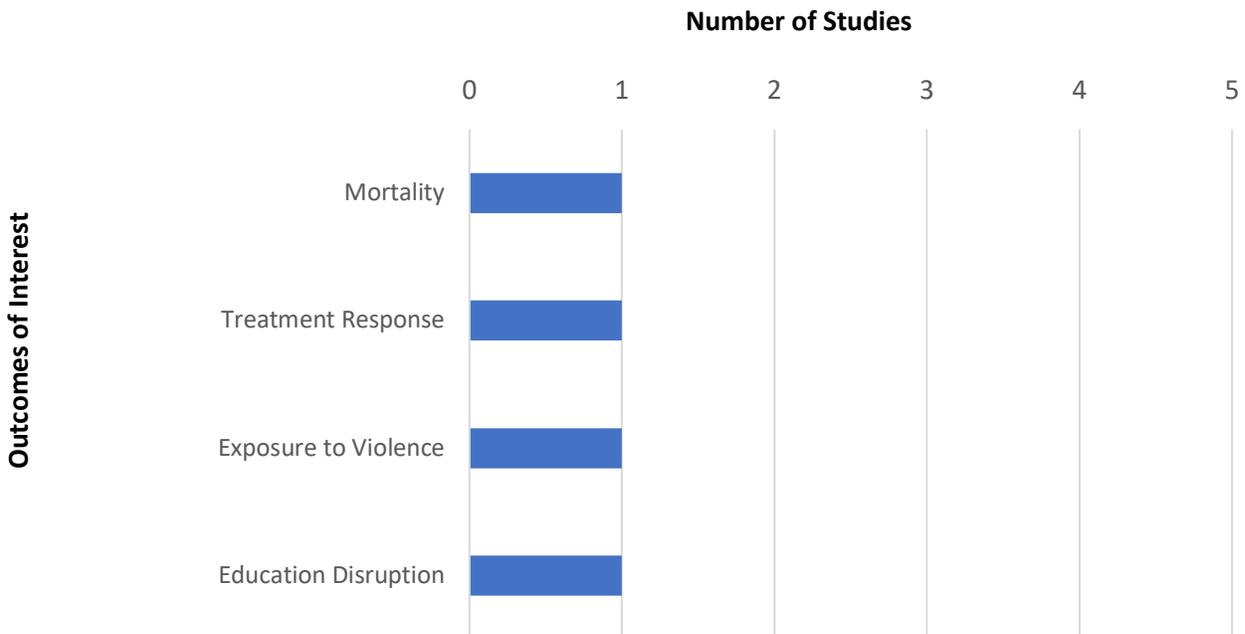
Sample Table 2. Overview and characteristics of included studies

Study	Country/Region	Participants & Methods	N	Study Quality
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Sample Table 3. Summary of included studies with outcomes assessed and description of relevant findings related to COVID-19 and gender

Study	Outcomes	Relevant Findings
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Sample Figure 2. Distribution of outcomes of interest across selected studies on COVID-19 with gender- and sex-disaggregated data



IMPLICATIONS

Gender continues to be a crucial influence in health, economic, and social outcomes. Global emergencies, like COVID-19, threaten to exacerbate and perpetuate gender inequalities, and require a gender lens for equitable response and interventions. This review synthesizes currently available gender- and sex-disaggregated data and evidence on COVID-19 and its impacts. We aim to periodically update this review as evidence continues to emerge. These results will have implications for policy recommendations and ongoing research in identifying priority issues, what gaps in knowledge remain, and recommendations for promoting health and gender equity in the midst and aftermath of COVID-19.

Declarations of Interest:

The authors declare no potential conflict of interest.

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