COVID-19

COVID-19 Sex Differences in the Americas

January 2020 to January 2021

February 1, 2021

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1. Introduction

The first cases of Coronavirus disease (COVID-19) was reported in Wuhan, China on 31 December 2019. Eventually, SARS-CoV-2 virus that can cause a range of illness from mild cough and shortness of breath to severe pneumonia spread uncontrollably from continent to continent. By 30 January 2020, the World Health Organization (WHO) officially declared the SARS-CoV-2 outbreak as a Public Health Emergency of International Concern (PHEIC) after meeting all of the International Health Regulation (IHR) guidelines (1). On 11 March, WHO characterized COVID-19 as a global pandemic and called for aggressive response measures to control its spread (2). One year later on 31 January 2021, there have been approximately 102 million cases of COVID-19 including over 2.2 million deaths globally. The pandemic accelerated in the Region of the Americas as the epicenter moved from Europe to the Americas by May, 2020. As of 31 January 2021, there were more than 45.6 million cases including 1 million deaths in the region. The crude case fatality ratio in the Region of the Americas for COVID-19 was 2.3% (3).

At the dawn of the COVID-19 pandemic, Region of the Americas had shown important advances in health conditions and outcomes. Life expectancy had increased 7 years over the past two decades, maternal mortality had decreased, and several communicable diseases were approaching elimination as governments embraced universal access to health (4). There was investment in emergency preparedness and disaster risk reduction to handle current and future threats to health. Despite the recent progress, the pandemic amplified existing health inequities and exposed cracks in the health system that are linked to wider socio-economic inequalities that disproportionately affect disadvantaged groups (5). Gender is one such key determinant of health, and has become an important driver of health outcomes for both men and women during the pandemic (6).

Although importance of incorporating gender equality into health emergency and disaster response is well recognized, there are frequent failures in activating a timely gendered approach to emergencies and disaster response (7). Member States in the Region remain committed to make advances towards gender equality in health. Data provided by Ministries of Health and analysis of the Region of the Americas on COVID-19 health outcomes by gender, sex, age, ethnicity and other demographic factors are presented here to highlight the uneven impacts of the pandemic. Importance of placing a gender perspective on the COVID-19 response will continue as more research and analysis comes to light.

2. Gender considerations associated with COVID-19

Gender dynamics in disease outbreaks and differing health outcomes include both physical mechanism (sex-based biological factors underlying host immune response) and socially constructed components (social, behavioral, and lifestyle factors). The coronavirus pandemic is no exception when it comes to gender differences in its association with susceptibility and severity of the disease, and access to health services. To realize a pandemic response that integrates a gender-responsive approach while considering social, economic, environmental, geographic, ethnic, and cultural factors, a deeper understanding of how the disease impacts individuals, gender-diverse groups, and populations, and their barriers to access needed health services is imperative.

Association between severe clinical characteristics and outcomes and age, sex, and underlying health conditions are well documented (8). In a meta-analysis of existing data, it was found that males might be more at risk of having a severe SARS-CoV-2 infection, with 50% more males hospitalized compared to females (9, 10). When considering the higher likelihood of males having more severe manifestations of COVID-19, the differences between biological pathways of how males and females fight off viruses have been examined. In general, females tend to produce a more effective and adaptive immune responses to viruses, which factors into the less severe cases of COVID-19 (11). Although children and young adults specific case fatality ratio is low, children are at risk of developing a complication related to COVID-19 known as Multisystem Inflammatory Syndrome (MIS) (12).

Due to women's caring roles and responsibilities, their livelihoods, their exposure to domestic violence and, their unequal participation in decision making at the higher levels of governance, there are less visible impacts of the pandemic that are not routinely quantified the way infections are counted. The Economic Commission for Latin America and the Caribbean (ECLAC) reports that especially in lower income countries, women are largely engaged in informal work and other vulnerable forms of employment (e.g. self-employment in small subsistence businesses, domestic work), which often leaves them out of formal social protection measures targeted to workers impacted economically by COVID-19 pandemic (13). Under these circumstances, gender inequality has been exacerbated by the pandemic, since women in the region have been disproportionately affected by increase in unemployment and poverty. The economic impact of the pandemic must also contemplate the gender gap in work hours increased during the COVID-19 pandemic, as mothers with young children were more likely than their male counterparts to reduce work hours (14).

This report will serve to review existing data on the sex differences in COVID-19 from the beginning of the pandemic in the Region up to January 31st, 2021, consciously unpacking available health and health related data. The intention is to draw attention to the way that the emergency has exposed gender gaps and to offer concrete opportunities to improve equitable response to the pandemic. There are currently 63 vaccines in clinical development and 174 in pre-clinical development (15). As we prepare to mount the the SARS-CoV-2 vaccination campaign, understanding vulnerabilities and contributions by age and sex will help us incorporate this key determinant of health in the largest public health response in our lifetime.

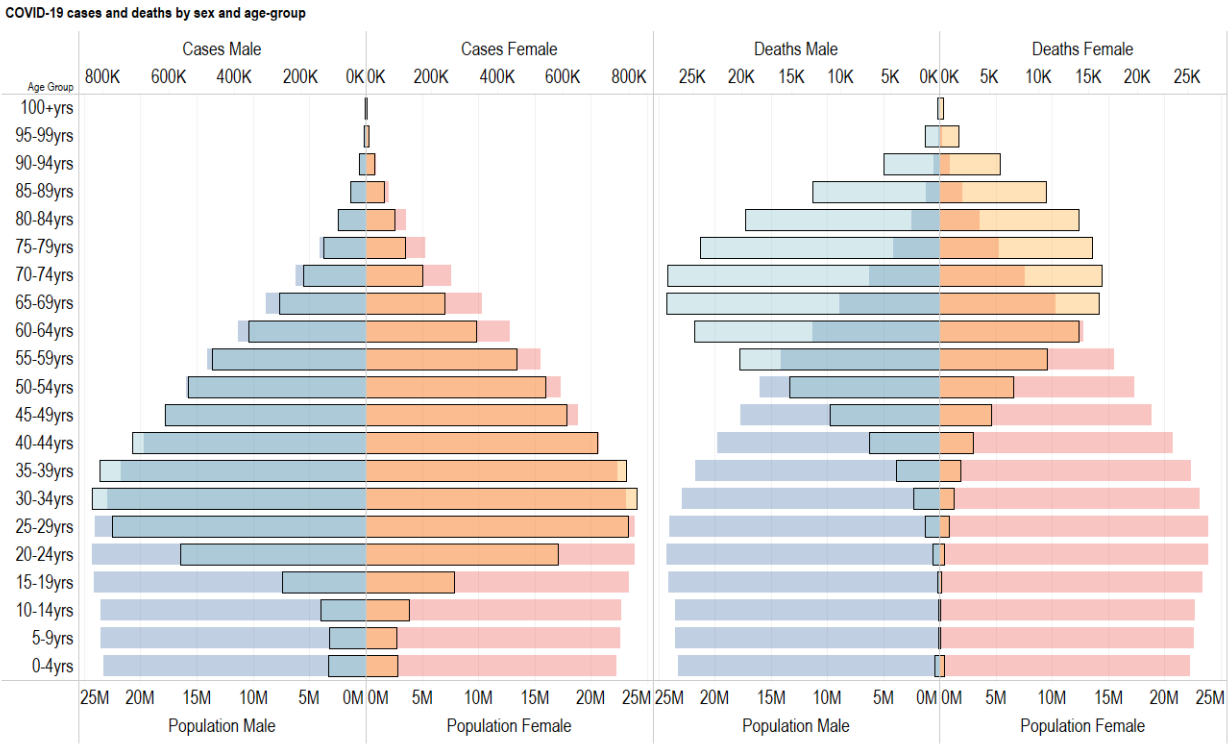
3. Analysis of sex differences related to the COVID-19 pandemic in the Region of the Americas

The Pan American Health Organization have implemented COVID-19 surveillance since the first case was detected in the Region of the Americas on 21 January. The surveillance efforts have enabled the Organization to monitor epidemiologic trends and evolution of COVID-19 virus, evaluate the impact of the pandemic on health-care systems, detect and contain outbreaks among vulnerable populations, and guide the implementation of control measures. Among the Organization's surveillance efforts, the COVID-19 Case Report Form collects key demographic, clinical, and epidemiological information on COVID-19 cases. This data is used to better understand the virus and its impact on health outcomes. The following section presents the age and sex distribution of COVID-19 cases and deaths in the Region.

3.1 Regional overview: Age and sex distribution

The region of the Americas has a total population of 1.02 billion of which 51% are female (16). Since the start of the COVID-19 pandemic, the region has recorded 45.6 million cases and 1.1 million deaths as of 31 January 2021. Case based report by Ministries of Health of 26 countries in the Americas contained sex and age information for 20 million cases (43% of all reported cases). The distribution of these cases are analyzed below (Graph 1).

Graph 1. COVID-19 cases and deaths by sex and age-group compared to base population in 26 countries and territories in the Region of the Americas



In the Region of the Americas, no major sex difference in the absolute number of cases is reported with 50% female cases. A small increase in proportion of COVID-19 diagnosis in men in older age groups is observed (Table 1). Males consist of 52% of cases reported among 60 to 69 years old, but decreases to 47.5% of cases among 70 years old and older. Nevertheless, comparable absolute numbers of cases in women and men indicates a higher incidence rate of men in older age groups. There is a larger baseline population of older women due to their longer life expectancy compared to older men. Incidence of COVID-19 cases among males 60-69 years and over 70 years is 23.1 per 1,000 population and 24.97 per 1,000, respectively. For age-group 60-69 years old, males have 3.89 cases per 1,000 population more than females.

Table 1. Percent of total cases and case rates per 1,000 population stratified by age and sex

Age Group	% Male	% Female	IR Male per 1,000 population	IR Female per 1,000 population
0-9yrs	53.4%	46.6%	4.77	4.34
10-19yrs	49.3%	50.7%	9.06	9.66
20-29yrs	49.1%	50.9%	25.28	26.74
30-39yrs	50.4%	49.6%	30.54	29.83
40-49yrs	50.0%	50.0%	29.61	28.54
50-59yrs	50.2%	49.8%	27.17	25.59
60-69yrs	52.0%	48.0%	23.1	19.21
+70yrs	47.5%	52.5%	24.97	21.03
Grand Total	50.0%	50.0%	21.16	20.6

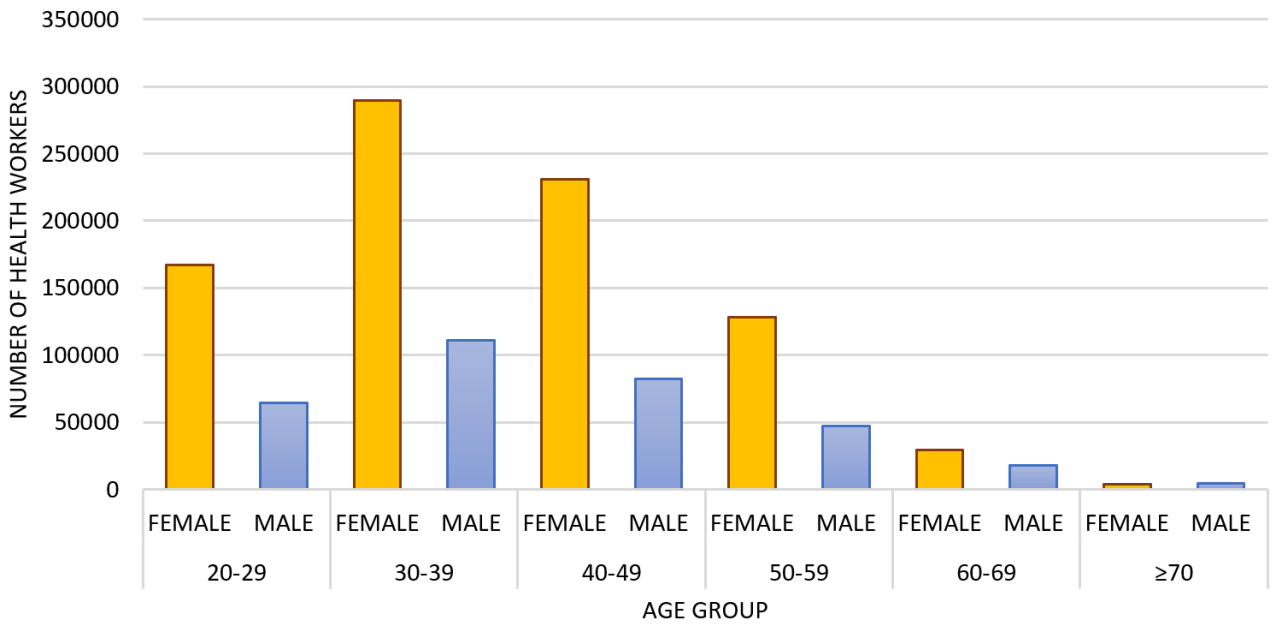
3.2 Specific populations: Health care workers

COVID-19 exposes health workers and their families to unprecedented levels of risk. In addition to increased exposure to the pathogen, health worker must face long working hours, psychological distress, occupational burnout, and stigma (17). Despite these hardships, they play a vital role in pandemic response, and protecting health workers is key to ensuring a functioning health system. To ensure patient safety, health worker safety must first be guaranteed (18).

At each pandemic wave in 2020, overstretched healthcare system in hard hit countries left health workers dealing with long hours, fatigue and stress. Despite low supplies and national lockdowns, health workers had to care for patients with suspected or confirmed SARS-CoV-2 infection without proper training and adequate PPE. The strain on health workers is not gender neutral. Globally, 70% of frontline health care workers are women. In the Region of the Americas, 86% of nurses, professionals that are required to make particularly close contact with sick patients, are women (19). Similar trends are seen in care work worldwide, as they are mostly undertaken by women and girls from socially disadvantaged groups such as migrants working in the informal economy (20). Through the use of appropriate personal protective equipment (PPE), the rates of health workers contracting COVID-19 can be greatly reduced. However, it is also vital to take into consideration factors such as stress, insufficient training, and understaffed units.

As of 31 January 2021, case based report by Ministries of Health included over 1.3 million cases among health workers in the Americas. Over six thousand health workers died due to COVID-19. Women account for 72% of cases among health workers. The difference between male and female health workers is starkest in age-groups 40 to 59, where 74% of cases are women (Graph 2).

Graph 2. Number of COVID-19 cases among health workers by age and sex



3.3 Multisystem Inflammatory Syndrome in Children (MIS-C)

Although COVID-19 cases and deaths are generally reported in older populations, a rare but associated complication among children has been observed as of May 2020. Multisystem Inflammatory Syndrome in children (MIS-C) presents similar symptoms to Kawasaki disease and can lead to multiple organ failure and shock. In the Americas region, 17 countries and territories reported 2,922 confirmed cases of MIS-C and 81 deaths (3%) at the end of January 2021 (Table 3). There is no significant difference between the rate of males children versus females children with MIS. Currently, 56% of the cases in the region are male, while 59% of deaths are female. At this time, it is unclear whether sex impacts rates of infection for MIS in children.

Table 3. Number of total confirmed MIS-C related to COVID-19

Country/Territory	Number of confirmed cases	Number of confirmed deaths
Argentina	65	1
Brazil	646	41
Canada	23	0
Chile	151	2
Costa Rica	27	0
Colombia	3	0

Country/Territory	Number of confirmed cases	Number of confirmed deaths
Cuba	2	0
Dominican Republic	103	5
Ecuador	8	0
El Salvador	17	0
French Guiana	1	0
Guadeloupe	4	0
Guatemala	2	0
Honduras	2	0
Panama	5	1
Paraguay	52	5
United States of America	1,811	26
Total	2,922	81

3.4 Pregnancy

The impacts of COVID-19 during pregnancy are still being analyzed, but pregnant women seem to more often require intensive care than non-pregnant women of reproductive age (21). Preexisting comorbidities, high maternal age, and high body mass index appear to put pregnant women at greater risk for severe COVID-19. In the region of the Americas, a total of 150,167 cases have been reported of COVID-19 during pregnancy including 836 deaths (Table 4). The case fatality ratio of COVID-19 ranges from 0.0% (Chile) to 6.25% (Bahamas). Data available for Mexico reveal that almost half of maternal deaths occurred during the third trimester and 33.6% of deaths occurred postpartum. Of the individuals in Mexico who died, 30.9% had been intubated and 34% had been in the intensive care unit.

Table 4. Number of total cases and deaths of pregnant women positive for SARS-CoV-2 and the case fatality ratio

Country	Number of pregnant women positives for SARS-CoV-2	Number of deaths among pregnant women positives for SARS-CoV-2	Case fatality rate (%)
Argentina	8,698	44	0.51
Bahamas	16	1	6.25
Bolivia	891	25	2.81
Belize	103	2	1.94
Brazil	4,880	252	5.16
Chile	7,881	3	0.04
Colombia	6,245	61	0.98
Costa Rica	286	3	1.05

Country	Number of pregnant women positives for SARS-CoV-2	Number of deaths among pregnant women positives for SARS-CoV-2	Case fatality rate (%)
Cuba	11	0	0.00
Dominican Republic	309	19	6.15
Ecuador	1,674	25	1.49
Guatemala	1,054	11	1.04
Haiti	76	4	5.26
Mexico	10,188	221	2.17
Panama	1,289	7	0.54
Paraguay	667	1	0.15
Peru	41,403	76	0.18
United States of America	64,075	74	0.12
Uruguay	82	0	0.00
Venezuela	339	7	2.06
Total	150,167	836	0.56

4. Reflections

The COVID-19 pandemic has highlighted existing gender inequalities and shed light on indirect gender implications as a result. Gender discrimination and other social exclusion variables can subject women and men to a higher risk of infection, limit their access to services and vaccines, undermine national responses, and exacerbate pre-COVID-19 inequalities. National lockdowns have resulted in higher levels of domestic violence towards women. An increase in household burdens has been especially demanding for women who must work from home. Effects of the coronavirus outbreak could exacerbate existing inequalities for women and slow the progress toward vital SDG targets, such as reducing maternal mortality and under-5 deaths. Subsequently, COVID-19 response plans must address gender impacts of the pandemic by including women in decision making, transforming inequalities of unpaid care, and designing socio-economic plans with focus on lives of women (22). Informing these decisions will require evidence-based recommendations based on thorough knowledge of the way different sex and gender are affected by the pandemic.

There is a significant negative outcome in incidence and mortality rates in men compared to women, particularly in older age groups. Sex-based physiological differences, including innate and adaptive immune response to infection, could explain this difference (11). Pre-existing comorbidities and social, behavioral, and lifestyle factors could also contribute to this bias. Additional research to study the socioeconomic, gendered and biological impacts of COVID-19 can give insight into the ways the virus disproporcionately destabilizes the lives of women and men, conditioning their right to health. These factors must be better understood to tailor overall responses as well as therapies and vaccine strategies.

The Region of the Americas which is inhabited by 13% of the world population has reported 43% of global COVID-19 cases. Populations living and experiencing different forms of social, economic and other vulnerabilities and inequalities, including many women, are disproportionately affected by the virus. Although infection in women tend to be less severe, the social implications have exacerbated the disparities that women face. Women account for 70% of health workers, placing them at a uniquely high risk of contracting the disease. Pregnant women may face higher risk of requiring intensive care or invasive ventilation. The scientific community continues to make gains in knowledge about this unprecedented virus, and evidence is rapidly produced and published in various formats. Rapid turnover of evidence requires continued work on comprehensive reviews of study findings. This would help guide policy changes needed to reflect increased protections for groups with increased vulnerabilities in the Region. Member States should make efforts to advance the fragile gains that have been made on gender equality in health access. COVID-19 has unveiled many existing vulnerabilities and disparities, emphasizing the need for accelerated efforts for institutional, transformative changes to leave no one behind. PAHO and Member States will continue to prioritize research, collecting, and reporting quantitative and qualitative data, disaggregated by sex and other socio-economic factors to expose inequities and contrasting impacts of the pandemic.

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