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## COVID-19 and Gender in the Arab States: **Using a human development lens to explore the gendered risks, outcomes and impacts of the pandemic on women's health**

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# List of Abbreviations

<b>AIDS</b>	Acquired immunodeficiency syndrome	<b>LGBTQI</b>	Lesbian, gay, bisexual, transgender, queer and intersex
<b>BMI</b>	Body mass index	<b>MERS</b>	Middle East Respiratory Syndrome
<b>CAD</b>	Coronary artery disease	<b>MSF</b>	Médecins Sans Frontières
<b>CFR</b>	Case fatality rate	<b>NCD</b>	Non-communicable disease
<b>CI</b>	Confidence interval	<b>NGO</b>	Non-governmental organization
<b>COVID-19</b>	Novel coronavirus disease	<b>OR</b>	Odds ratio
<b>DSM</b>	Diagnostic and Statistical Manual of Mental Disorders	<b>PCR</b>	Polymerase chain reaction
<b>EMRO</b>	Eastern Mediterranean Regional Office	<b>PPE</b>	Personal protective equipment
<b>FGM</b>	Female genital mutilation	<b>PTSD</b>	Post-traumatic stress disorder
<b>GBV</b>	Gender-based violence	<b>SARS</b>	Severe acute respiratory syndrome
<b>GBVIMS</b>	Gender-Based Violence Information Management System	<b>SDG</b>	Sustainable Development Goals
<b>GCC</b>	Gulf Cooperation Council	<b>SGBV</b>	Sexual- and gender-based violence
<b>GDP</b>	Gross domestic product	<b>SRH</b>	Sexual and reproductive health
<b>HCW</b>	Health care worker	<b>UAE</b>	United Arab Emirates
<b>HIV</b>	Human immunodeficiency virus	<b>UHC</b>	Universal Health Coverage
<b>IBS</b>	Inflammatory bowel syndrome	<b>UN</b>	United Nations
<b>ICU</b>	Intensive care unit	<b>UNDP</b>	United Nations Development Programme
<b>IOM</b>	International Organization for Migration	<b>UNESCWA</b>	United Nations Economic and Social Commission for Western Asia
<b>IRC</b>	International Rescue Committee	<b>UNFPA</b>	United Nations Population Fund
<b>IUD</b>	Intrauterine device	<b>UNHCR</b>	United Nations High Commissioner for Refugees
<b>KSA</b>	Kingdom of Saudi Arabia	<b>UNRWA</b>	United Nations Relief and Works Agency
		<b>US</b>	United States
		<b>USD</b>	United States dollar
		<b>WHO</b>	World Health Organization



# Section 1

## Introduction

Women globally are underrepresented among the research, public health and political decision-making entities responding to the novel coronavirus (COVID-19) pandemic. Women represent just 20 per cent of the World Health Organization (WHO) Emergency Committee on COVID-19 and under 25 per cent of national COVID-19 response committees across 30 countries.<sup>169</sup> A study of gender representation in COVID-19-related news media globally found that in both high-income and resource-limited settings, women commentators were featured in only a quarter or fewer of all COVID-19-related news reports, despite representing nearly 90 per cent of the caregiving task force.<sup>170</sup> Similar trends are observed in the Arab States region,<sup>171</sup> where women comprise the majority of the frontline health care and informal caregiver workforces,<sup>172</sup> yet are underrepresented in COVID-related decision-making.

This underrepresentation carries implications for the development of gendered policy responses and prioritization of women's needs in public health approaches to the pandemic. These needs include those related not only to women's unique risk of infection and severe disease through informal caregiving, but also to the more implicit effects of the pandemic, such as mental illness, sexual and gender-based violence (SGBV), and interrupted access to preventative health care.

Gendered impacts have been described in high-resource and comparable low- and middle-income settings. For example, in Southeast Asia, cross-sectional surveys of over 15,000 respondents across four countries suggest that women are more likely than men to experience an increase in unpaid domestic work and suffer poor mental health outcomes, and are less likely to access public health information or medical care, including sexual and reproductive health (SRH) care, as a consequence of the pandemic.<sup>173</sup> Indeed, the Guttmacher Institute projects that the diversion of SRH resources to COVID-19 care will lead to an additional 49 million women with an unmet need for contraception in 132 low- and middle-income countries over the next year, resulting in 15 million unintended pregnancies, 28,000 maternal deaths, and 3.3 million unsafe abortions.<sup>174</sup>

Understanding sex differences and gender disparities in COVID-19 testing, incidence, and mortality rates in the Arab region is critical to generating data-driven policy responses to this public health crisis, particularly as the gendered pathways to infection may be heavily influenced by patriarchal cultural norms. Yet fewer than half of the Arab states have publicly released sex-disaggregated incidence and mortality data since the onset of the pandemic, and the data released is inconsistently shared and often of poor quality.

This is not the first infectious pandemic or epidemic to expose gender disparities within the Arab states. Assumptions about women's sexual practices along with barriers to testing and limited surveillance infrastructures facilitated long-standing misconceptions about Arab women's HIV risk, with studies in recent years demonstrating that marriage is the most significant risk factor for HIV infection among women in the Arab region.<sup>175</sup> It is important to note that the omission of sex-disaggregated data for health outcomes is not unique to either COVID-19 or the Arab region: fewer than 1% of all peer-reviewed studies on the Ebola and Zika outbreaks, for instance, cited the gendered implications of those diseases.<sup>176</sup>

The primary aim of this report is to explore the multifactorial impacts of the COVID-19 pandemic on women's health in the Arab region. Adopting a conceptual framework that incorporates biological as well as gendered sociocultural, political, and economic determinants of women's health, we explore the myriad and intersectional ways in which gendered systems across diverse settings in the Arab states increase risk of disease while restricting health care accessibility for women and girls. We consider the multiple, ongoing humanitarian crises in this context, including protracted armed conflict, forced displacement, as well as the effects of economic collapse and political instability, which may amplify gendered health disparities. Examining evidence from other settings, we identify major data gaps within the Arab states and provide recommendations to improve our knowledge base.

The long-term goal of this work is to raise awareness of the unique and often overlooked health needs of women in settings of crisis, both to inform current and future policy responses, and to advocate for gender equity in the Arab region.

# Section 2

## Conceptual Framework and Methodology

### Conceptual Framework

We developed a conceptual framework, illustrated in **Figure 1**, which expands upon that of Heise et al.<sup>9</sup> and is specifically adapted to the Arab context of the COVID-19 pandemic. The proposed model delineates the relationships between observed sex differences related to the protective immunomodulatory effects of oestrogen and sex chromosomes, and gender disparities created by intersectional cultural norms, which shape risk of SARS-CoV-2 transmission, vulnerability to severe disease, care-seeking behaviours, interactions within health systems, and health care accessibility. We propose that such factors lead ultimately to gender inequities in both primary and secondary COVID-19-related health outcomes, though there remain evidence gaps regarding the impact of the pandemic on women in the Arab region. As such, the COVID-19-specific gendered health disparities highlighted in the fifth column are hypothesized and based upon the available data and trends from other contexts.

Intersectional power hierarchies are rooted in this framework, which emphasizes the fundamental gendered barriers not only to health care, but also to the determinants of good health. As women represent a heterogeneous population, their vulnerability to COVID-19 should accordingly be interpreted not only through a gender lens but also by considering other social identities such as socio-economic class, refugee and immigration status, race, nationality, and age.<sup>10</sup> Additional challenges specific to the region are related to massive and protracted forced displacement, the historic underinvestment in public health infrastructure and primary care, and the fragmentation and privatization of health services, which effectively exclude and/or marginalize underprivileged communities, including the 62 per cent of working women employed in the informal sector.<sup>11</sup> Furthermore, in war-affected settings like Libya, Syria and Yemen, health systems have been weakened by decades of armed conflict and deliberate weaponization of health care.<sup>12</sup>

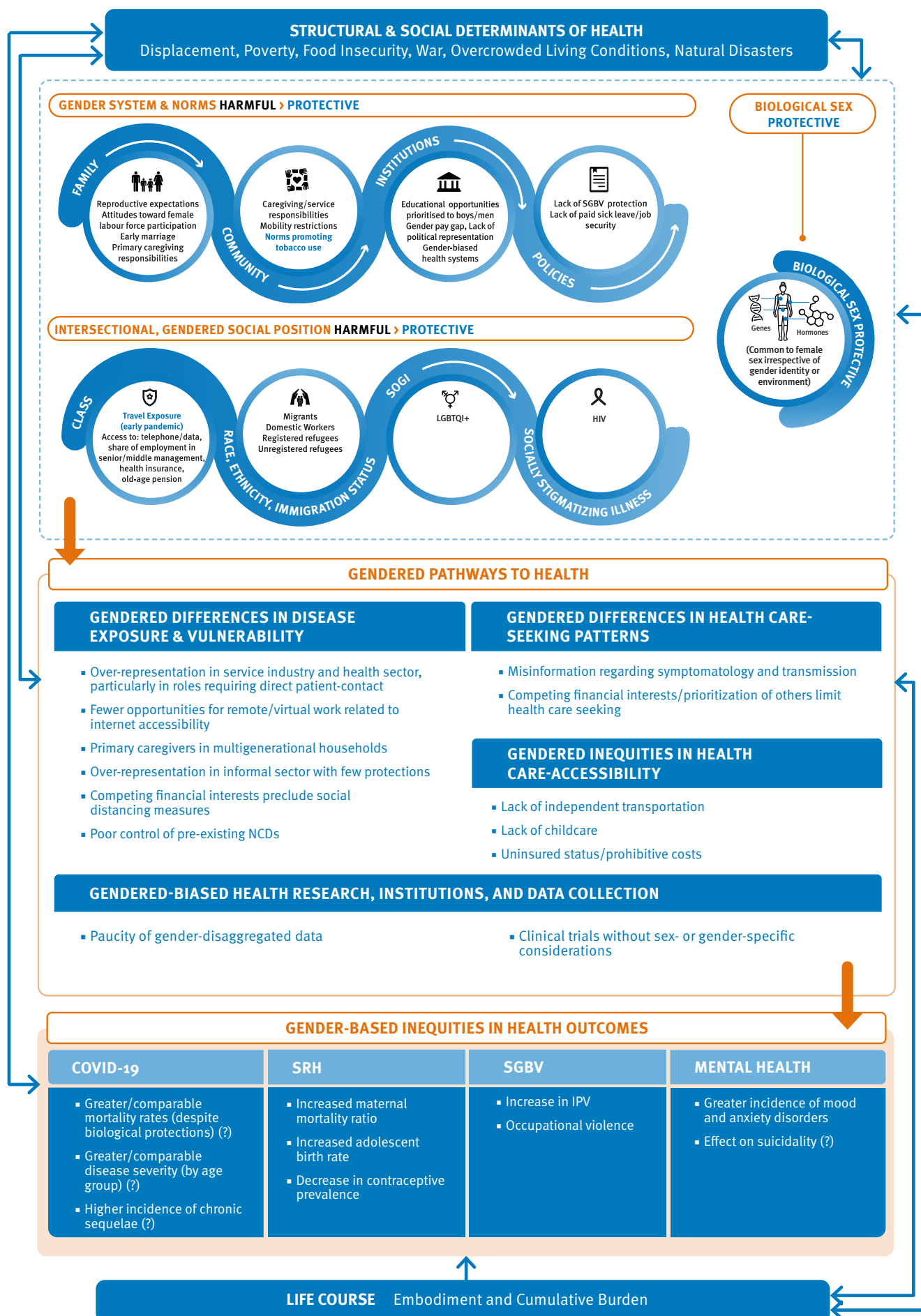
One example of a pathway leading to severe COVID-19 illness is through Arab women's role as primary caregivers to dependent relatives. Informal caregiving was identified as a major risk factor for illness during the Ebola epidemic of 2014-2016 among women in West Africa, and may pose similar risk for COVID-19.<sup>13</sup> In the context of the COVID-19 pandemic, caregivers may be in confined areas with infected persons for extended periods of time, thereby increasing the inoculum of virus to which they are exposed. High viral load exposure has been correlated with severity of COVID-19 illness,<sup>14</sup> and postulated as a leading mechanism by which health care workers develop severe disease.<sup>15</sup> Where informal caregivers lack the protective equipment afforded to frontline workers, they may be at even greater risk of infection. Additional gender disparities in health care accessibility, from fear of care-seeking due to COVID-19 stigmatization to prohibitively expensive health services, may further increase women's risk of severe illness and even death.

While female sex appears to confer some degree of protection against severe COVID-19 disease,<sup>16</sup> restrictive gender roles perpetuated at the family, community, and society level in active or post-conflict, patriarchal settings may "outweigh" these biological advantages. Women in the Arab states may be subject to unique risk factors as compared with men, as well as with women living in Western countries or in other nations in the Global South. These could influence not only their risk of SARS-CoV-2 exposure, but also their likelihood of accessing health care and their vulnerability to indirect consequences of the pandemic, including mental illness and poor general and sexual and reproductive health.

### Methodology

We adopted a multi-pronged approach that included a systematic search of the peer-reviewed and grey literature, secondary analysis of publicly available COVID-19 and other health data, and consultations with key contacts engaged in COVID-19 and gender work throughout Arab countries and other regions.

**Figure 1. Conceptual framework of COVID-19 and gender in the Arab States**



Sources: Heise, Lori, et al. "Gender inequality and restrictive gender norms: framing the challenges to health." The Lancet 393.10189 (2019): 2440-2454. [http://hdr.undp.org/sites/default/files/covid-19\\_and\\_human\\_development\\_gender\\_dashboards\\_final.pdf](http://hdr.undp.org/sites/default/files/covid-19_and_human_development_gender_dashboards_final.pdf).

## Search Strategy

We conducted a systematic search of the peer-reviewed and grey literature pertaining to the direct and indirect health effects of COVID-19 on women in the Arab region from December 2019 through September 2020. Prior to publication, a repeat search was conducted through January 2021 in order to include the most current literature through 31 December 2020. The search strategies for both the peer-reviewed and grey literature were determined in consultation with a medical and health sciences librarian.

The databases used for the peer-reviewed literature include Ovid MEDLINE, SCOPUS, CINAHL, APA and PsychInfo. Distinct search strategies with separate keywords and medical subject heading (MeSH) terms were adopted for each of the report's individual themes. Studies featuring a gender-based analysis using defined populations of women residing within the Arab states, including specific sub-populations such as health care workers and refugees, were included. Outcomes of interest included any health outcomes related to COVID-19 exposure, risk, morbidity and/or mortality, the impact of the pandemic on other aspects of women's health and well-being, and gender disparities in health care accessibility related both to COVID-19 and non-COVID-19 illness. Articles published in Arabic, English and French were included.

To survey the grey literature, we conducted a comprehensive search of the websites pertaining to 27 local, regional and international organizations operating within the Arab states, in addition to performing strategic searches using Google. All publication types were included. However, to ensure a data-driven approach, only reports that featured primary data or secondary data with appropriately cited sources were included.

Comprehensive details regarding methodology including search strategies, grey literature sources, and inclusion and exclusion criteria may be found in Supplement A.

## Secondary Data Analysis

Through consultations with key contacts throughout the region and use of publicly available databases, we have also assembled a comprehensive data profile for each of the Arab states (indicating existing gaps) that includes sex-disaggregated data on COVID-19 testing, incidence, and mortality, gender-disaggregated data on cadres of health care workers, and sex differences in COVID-19 incidence and mortality among health care workers.

We have also amassed country-specific data on various health, structural, and social determinants of COVID-19 severity and mortality, including gender-disaggregated data on unemployment, labour force and political participation, internet accessibility, literacy, tobacco use, and prevalence of non-communicable diseases (NCDs) including obesity and diabetes.

Additionally, we have compiled pre-pandemic, country-specific data on indicators of sexual- and gender-based violence (SGBV), including sexual, physical and economic abuse from a spouse and incidence of femicide.

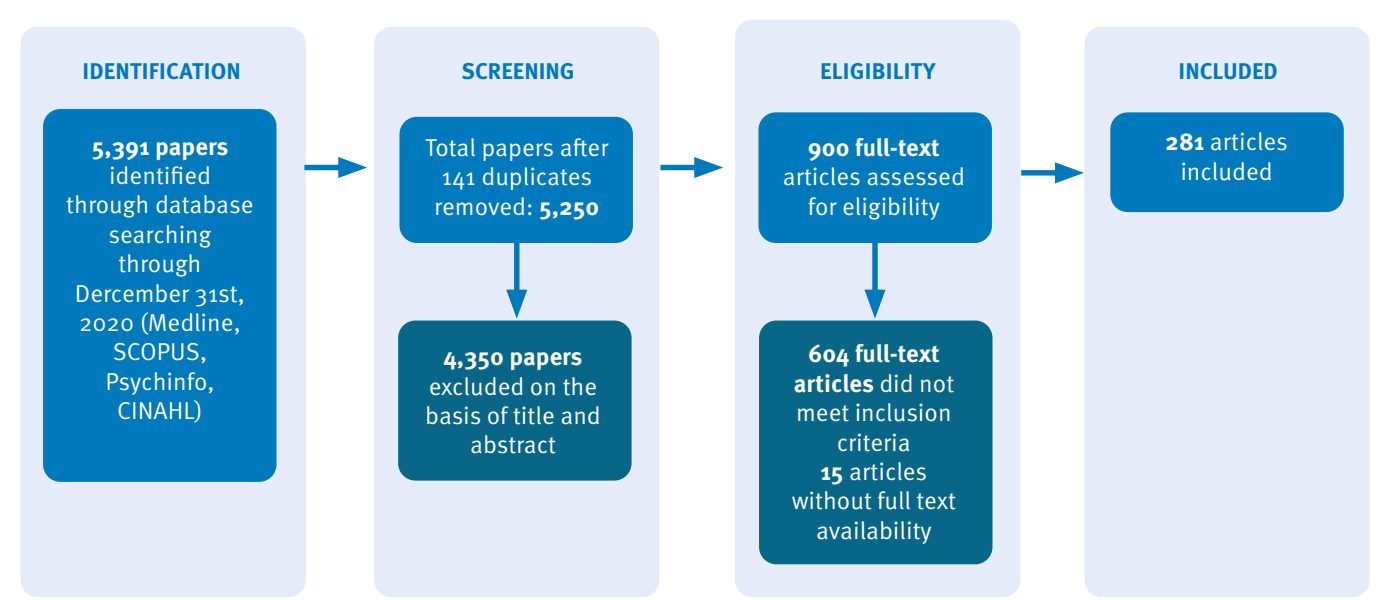
Finally, we have consulted with public health experts within the Arab states as well as those conducting gender work in other regions, to better understand regional and global knowledge gaps and compare trends across different cultural contexts.

## Data Extraction and Synthesis

All peer-reviewed studies were imported into Endnote X8.2. Grey literature reports were outlined in Excel. Duplicates were removed and studies that did not meet inclusion criteria on the basis of title and abstract screening were excluded. The remaining full-text articles were assessed for eligibility. Data extracted for studies satisfying inclusion criteria included authors and institutions, title and journal, study objectives, article type, study design, population, sample size, setting, and gendered results.

**Figure 2** shows the flow diagram for peer-reviewed study selection. Data synthesis followed a thematic analysis based upon our conceptual framework.

Figure 2. Flow chart diagram detailing selection of articles from peer-reviewed literature



# Section 3

## Gendered Analysis of the COVID-19 Epidemiology

### Introduction

Global sex-disaggregated data on SARS-CoV-2 testing, publicly available in only 10 high- and upper-middle-income countries, suggests that women are being tested at a higher rate than men.<sup>17</sup> Yet the COVID-19 incidence rate appears to be very similar among men and women across 127 countries. Further, in the few countries for which data on morbidity is available, men represent the majority of hospitalizations and ICU admissions, as well as 58 per cent of deaths. The reasons for these differences, illustrated in our conceptual framework, are complex and likely related to sex-based variability in immunological and hormonal profiles, as well as to contextual, gendered differences in exposure, predisposing illnesses, and health care seeking-behaviours and accessibility.

Whether such trends are applicable in the Arab region remains to be seen: preliminary data on testing, incidence, and mortality from several nations in the region suggests otherwise.<sup>18</sup> Most publicly available sex-disaggregated data globally comes from high- and upper-middle-income countries, whereas nations in the Global South remain wholly underrepresented. In armed conflict settings in particular, where limited health care capacity and perceived security risks by authoritarian governments preclude publicization of accurate incidence and mortality data, women may have even less access to testing and treatment despite their increased risk of disease.<sup>19</sup>

As outlined in our conceptual framework, biological determinants such as oestrogen are protective and may largely account for the sex differences observed in COVID-19 mortality rates globally. In the region, factors unique to the conflict-affected and patriarchal context of the Arab region may make women and girls more vulnerable to acquiring COVID-19 infection on the one hand, and yet less likely to access testing and treatment on the other. However, gender disparities in health care accessibility may not be associated with higher mortality rates in women, as sex-disaggregated NCD-related mortality data from the region (Table 1) indicates higher rates among men, consistent with global trends.

Sex is a determinant of clinical manifestations among a variety of disease states; understanding such variability between men and women in COVID-19 incidence and mortality is essential for early detection and treatment.<sup>20</sup>

**Table 1. Sex-disaggregated NCD-related mortality data in the Arab States, 2000-2016**

NCD-RELATED MORTALITY RATE								
COUNTRY	2000		2010		2015		2016	
	Women	Men	Women	Men	Women	Men	Women	Men
ALGERIA	596.8	671.9	467.7	498.1	436.1	467.7	430.7	462.8
BAHRAIN	682.6	724.8	515.2	579.7	441.6	464.6	430.1	449.5
DJIBOUTI	596.9	685.4	553.1	624.2	562.1	652.2	565.5	658.7
EGYPT	653.4	934.7	716.4	985.9	744.1	1004.8	711.8	965.7
IRAQ	689.1	762.1	620.9	713.1	615.4	706.4	604.5	695.5
JORDAN	653.1	787.3	583.2	732.1	547.9	698.2	542.4	693
KUWAIT	732.1	766.2	664.2	707.6	553.1	615	541.4	603.6
LEBANON	587.3	729.5	519.7	637.6	517.3	634.9	516.4	635.7
LIBYA	681.8	807.2	588.1	783.6	566.8	745	567.9	766
MOROCCO	706.2	825.1	522.7	626.9	490.6	584.5	483.8	580.1
OMAN	548.5	695.7	448.1	586.3	411.5	539.1	404.6	528.8
QATAR	502.6	549.9	469.8	533.1	431.5	490.5	425.5	488.2
SAUDI ARABIA	557.2	686.8	549.1	648.5	515.2	614.9	508.5	609.5
SOMALIA	660.4	704.7	609.8	628.6	627.4	669.3	624.7	666.9
SUDAN	781.2	899.5	714.4	813.3	697.3	794.6	700.1	795.5
SYRIA	585	779.2	598.9	728.8	594.1	721.9	594.7	723.1
TUNISIA	508.5	734.8	479.6	682.5	469.6	640.6	460.6	630.4
UNITED ARAB EMIRATES	570	634.1	496.9	547.5	467.1	523.5	460	517.2
YEMEN	857.8	996	847.4	978.7	819.3	950.5	819.7	951.6
PALESTINE	..	..	..	..	..	..	..	..
WORLD	570.5	749.4	517	670.7	496.3	643.7	491.9	638.3

*Definition:* The age-standardized mortality rate attributed to noncommunicable diseases is a weighted average of the age-specific mortality rates per 100,000 persons, where the weights are the proportions of persons in the corresponding age groups of the WHO standard population. Non-communicable diseases include cardiovascular disease, cancer, diabetes and chronic respiratory disease.

*Source:* WHO (2018). Global Health Observatory. <https://apps.who.int/gho/data/view.main.2490>. Accessed 26 August 2020.

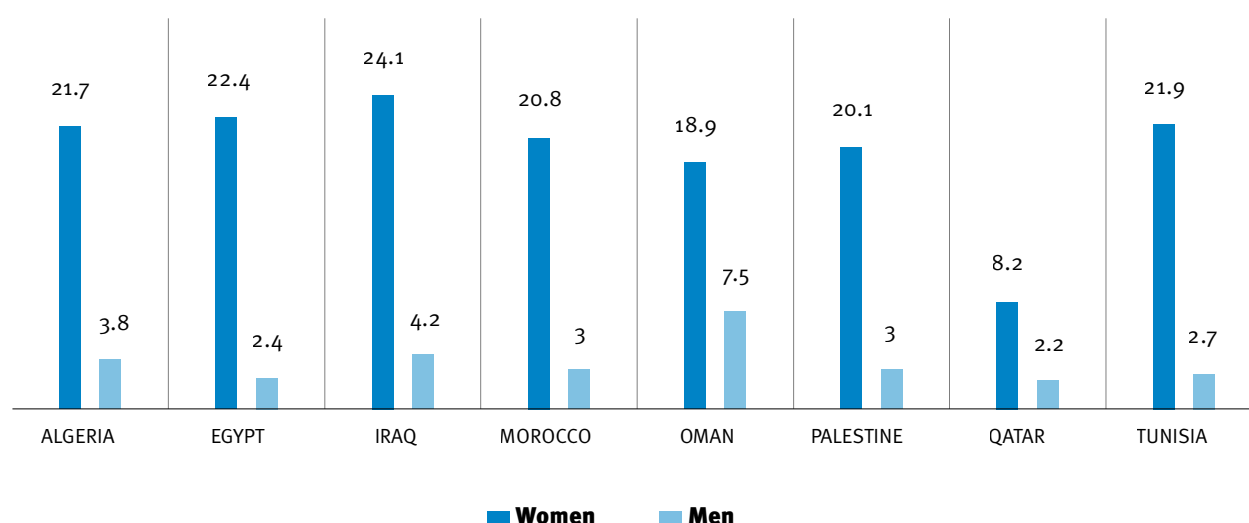
## Gender Disparities in SARS-CoV-2 Exposure and Risk of Severe Illness

### SARS-CoV-2 Exposure Risk and Unpaid Domestic Work/Caregiving

Gender norms in the Arab region are likely to have opposing effects on the risk of SARS-CoV-2 exposure. On one hand, cultural practices in some Arab countries, particularly in the Gulf, may be protective against COVID-19 for women, as men are afforded greater autonomy and are more likely to socialize outside of the home. This was observed even in Jordan, where a longitudinal cohort study of 4,100 Palestinian, Syrian, and Jordanian adolescents found that 42 per cent of males, as compared with 31 per cent of females, reported interacting with a friend in the preceding seven days, while only 19 per cent of males compared with 54 per cent of females remained indoors during that time.<sup>21</sup>

Contrastingly, women may be at increased risk of viral exposure through their role as primary caregivers of dependent relatives. Additionally, this risk is made more apparent as the pandemic evolves over time, with unmitigated community transmission, rather than travel, now the primary mode of exposure in the region. Patriarchal gender norms in the Arab region confer sole caregiving responsibilities of both children and elders onto women, who devote 4.7 more time to unpaid domestic work than do men, the highest disparity of any region.<sup>22</sup> **Figures 3-5** illustrate baseline gender differences in unpaid domestic work in select countries in the region for which there is data. Accordingly, gender ratios of incident COVID-19 cases may be expected to shift, as women's domestic roles may confer a greater risk of exposure than men's obligations as primary breadwinners outside the home.

**Figure 3. Gender disparities in time spent on unpaid domestic work for countries where data is available**

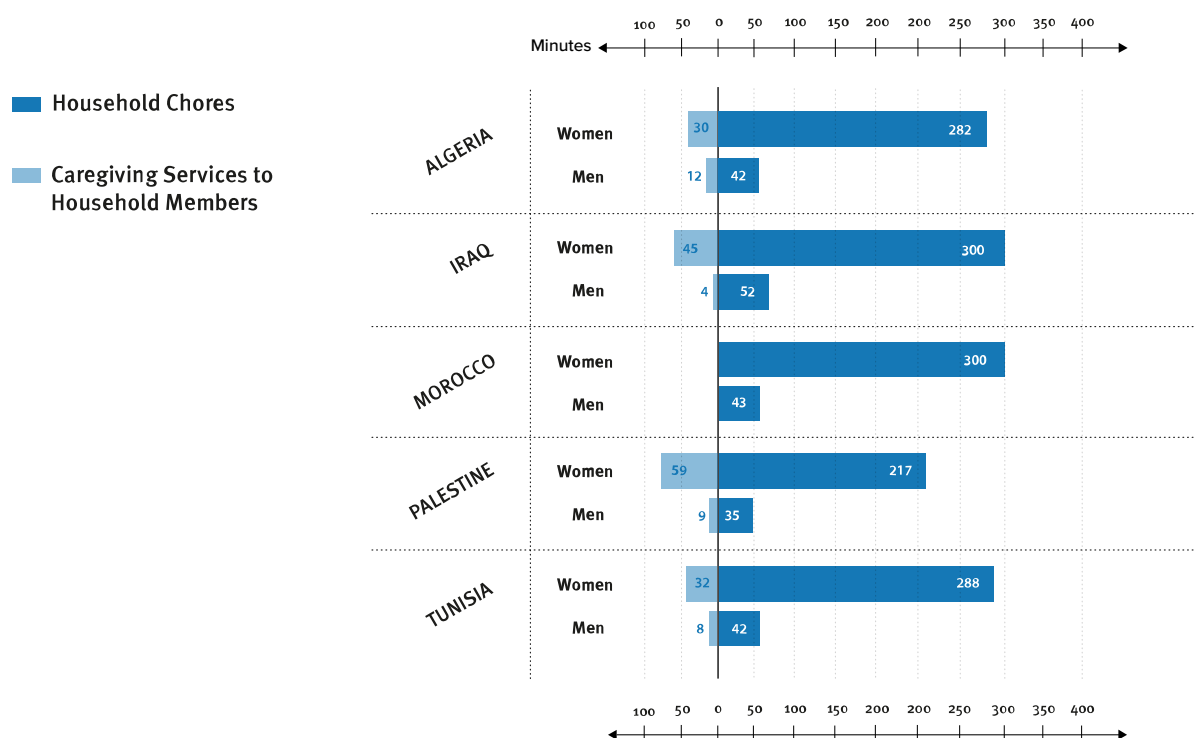


Source: UN-Women – Women Count (2022). <https://data.unwomen.org/>.

UN Women conducted a web-based cross-sectional study of 16,462 adults (30 per cent female; N=5070) in nine Arab countries to determine the impact of COVID-19 on gender roles.<sup>23</sup> In six of the nine countries included, women were more likely than men to work from home as a result of the pandemic, yet, in all nine countries, a statistically significant higher number of women than men described an increase in unpaid domestic work since the onset of the pandemic, a trend that was strongest among married women. Although data is limited, these figures may be influenced by an over-representation of women employed in the education sector and high numbers of primary school teachers working from home. Notably, the report does not specify the number of unmarried female respondents, making it challenging to gauge the impact of marriage on women's burden of unpaid domestic work. This increase in household chores among married women ranged from 24.3 per cent of Yemeni women to 62.3 per cent of Tunisian women. In comparison, a range of 19.2 per cent to 35 per cent of men reported an increase. Gender roles persisted even in domestic work, as women were more likely to report an increase in household chores and serve as caregivers to children, while men were more involved in children's online education.

Though there is little sex-disaggregated incidence data available in the region to corroborate the expected dynamic characteristics of COVID-19 gender ratios over time, similar trends have been observed in prior epidemics. For instance, during the HIV/AIDS epidemic, predominantly male “key populations” accounted for the majority of early cases, but over time, women, primarily through their submissive role in systems upheld by masculinity that facilitated intimate partner transmission, became overrepresented among new cases.<sup>24</sup>

**Figure 4. Gender disparities in daily time spent on two main categories of unpaid care work for countries where data is available**



Source: Addati L, Cattaneo U, Esquivel V, Valarino I. Care work and care jobs for the future of decent work. Op. cit. 2018.

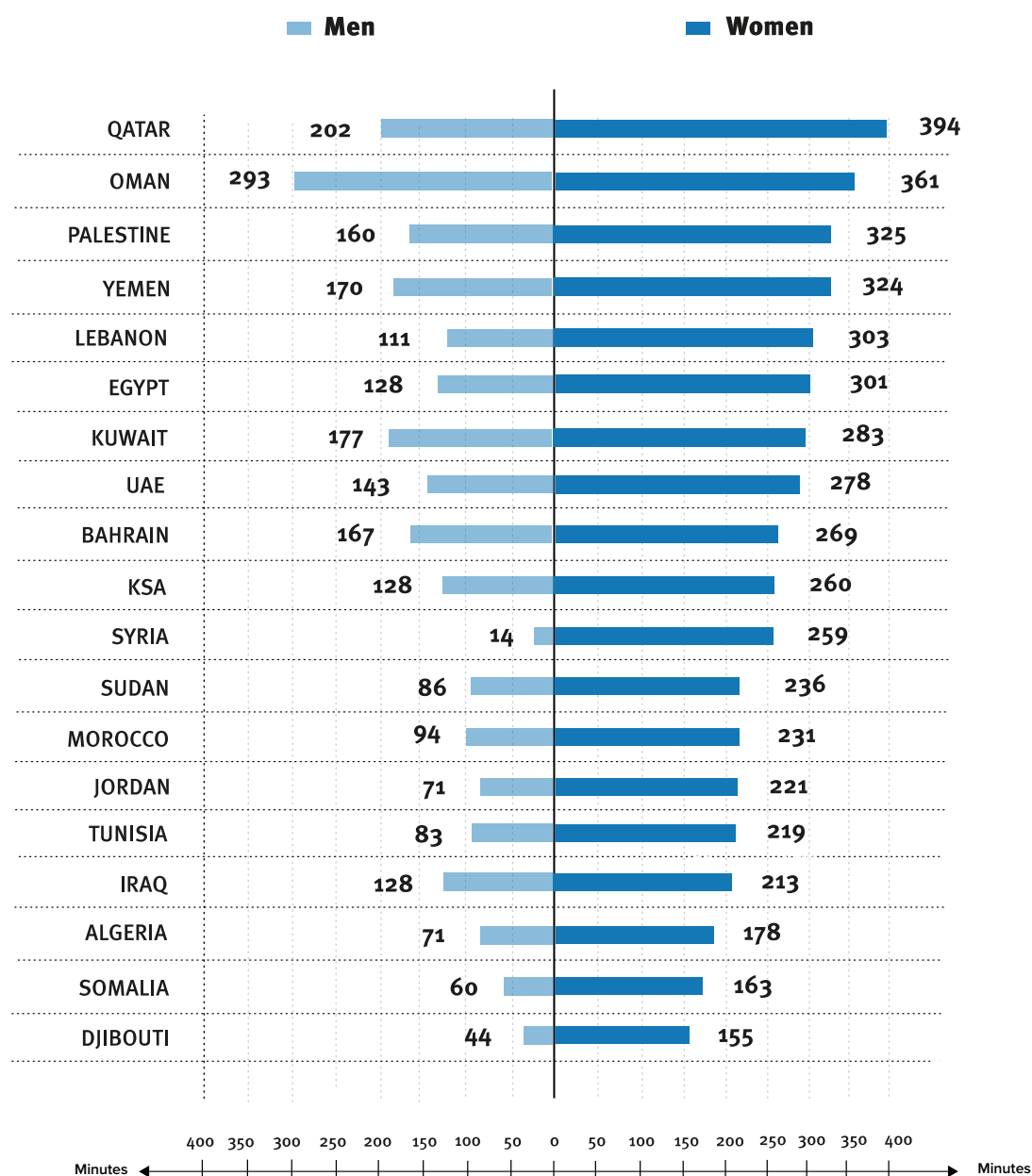
Globally, women have been disproportionately burdened by an increase in unpaid domestic work during the COVID-19 crisis while losing hard income in the face of overwhelming - and gendered - job loss. Since the onset of the pandemic, employed mothers in the United Kingdom, for instance, were 47 per cent more likely than fathers to permanently lose their jobs, a trend thought to be largely driven by women’s childcare obligations in the context of widespread school closures.<sup>25</sup> Similarly, a prospective study of a nationally representative sample of adults living in the United States found that, during the pandemic, one in three employed mothers, compared to just 10 per cent of employed fathers, assumed sole responsibility over school-age childcare.<sup>26</sup> In fact, childcare responsibilities were thought to account for the withdrawal of 1.6 million mothers from the American labour force in September 2020 alone.<sup>27</sup> Gender disparities in unpaid care work have cut across cultures and professions to inflict far-reaching consequences on women’s health and livelihood productivity.<sup>28</sup>

Similar trends in unpaid domestic work and caregiving have been repeatedly demonstrated across many Arab countries. A globally administered cross-sectional survey of gender equality commissioned by Facebook in July 2020, which included 17,586 female and 21,062 male social media users in the Arab states, found that women were nearly three times more likely to report increased time spent on unpaid domestic work such as cooking and cleaning as a consequence of the pandemic than were men.<sup>29</sup> In Palestine, a cross-sectional survey of 800 Palestinian adults revealed that 58 per cent of women compared with 40 per cent of men perceived a disproportionate increase in household chores, including childcare responsibilities (41 per cent versus 32 per cent) since the onset of the pandemic.<sup>30</sup> The unequal increase in unpaid labour is partially due to occupational differences in men and women, as the vast majority of the 133,000 Palestinians who live in the West Bank and work within Israel and Israeli



settlements are men. During the initial lockdown in spring 2020, which lasted roughly two months, many remained within Israel in order to continue working, thereby increasing the burden on their wives who may not have had an immediate source of income and were now solely responsible for domestic responsibilities.<sup>31</sup>

**Figure 5. Gender disparities in daily time spent on childcare for countries where data is available**



Source: Addati L, Cattaneo U, Esquivel V, Valarino I. Care work and care jobs for the future of decent work. Op. cit. 2018.

A study conducted in Jordan<sup>32</sup> estimated that married women with school-age children experienced an increase in unpaid domestic work by 18 to 24 hours per week as a consequence of the pandemic. The time women spent on unpaid work following the onset of the pandemic was 17 times greater than that of men, compared with a global average of 3.2. Jordanian men, on the other hand, were estimated to have spent 6.5 times more time than women on paid labour, compared with a global average of 1.8. Among women who retain full-time employment, such an increase resulted in 80 to 85 hours worked per week, and over 90 hours per week for female health care workers. Contrastingly, Jordanian men irrespective of marital status or employment did not experience a similar increase in unpaid labour; most are estimated to work 47 hours of paid and unpaid work per week.

A cross-sectional study of 847 Jordanian and Syrian adults (94.2 per cent female) in Jordan published in April 2020<sup>33</sup> found that three-quarters of respondents felt that women experienced greater child-rearing and educational responsibilities than men as a result of the pandemic. An increase in overall caregiving responsibilities was reported by 95 per cent of women, raising concerns about some women's ability to resume their pre-pandemic employment should obligations of unpaid domestic work persist.

Similar trends were observed in Lebanon, where 81 per cent of Lebanese women and 73 per cent of Syrian women have described an increase in unpaid domestic work as a consequence of the pandemic, compared with only 64 per cent of both Lebanese and Syrian men.<sup>34</sup> Predating the pandemic in Lebanon, 90 per cent of women as compared with roughly just 50 per cent of men reported conducting domestic work.

A recent rapid gender analysis of the pandemic in Lebanon involving Lebanese and Syrian NGO beneficiaries<sup>35</sup> found that 57 per cent of men as compared with 11 per cent of women interviewed reported having control of their income, while 64 per cent of women acknowledged that they did not have any personal source of income. Further, men devote 86 per cent of their time on paid work and 14 per cent on household chores, whereas women devote 83 per cent of their time to unpaid domestic work. The theme of women taking on a disproportionate burden of unpaid labour and caregiving of children, elderly, persons with disabilities, and other relatives emerged in the qualitative data, with some study participants describing distress as a result.

Likewise in Iraq, a study on the gendered effects of the pandemic demonstrated that 80 per cent of respondents thought that domestic work, childrearing, and caring for ill relatives should be done by women.<sup>36</sup> Women are estimated to have spent over six hours daily on unpaid domestic work, which is 10.5 weeks more annually than did men. In a nationally representative survey of over 1,500 Egyptian women, approximately half of the sample noted a rise in household chores since the onset of the pandemic, while over 60 per cent specifically described an increase in childcare responsibilities.<sup>37</sup> Along these lines, a nationally representative sample of 756 Somali adolescents and adults found that approximately 12 per cent of women noted an increase in unpaid domestic work since the onset of the pandemic.<sup>38</sup>

Gender disparities exist across multiple sectors and predate the pandemic in many countries in the region, which has the world's lowest female labour force participation rate of just 21 per cent compared with men's at 70 per cent.<sup>39</sup> A cross-sectional study done on a representative sample of 944 pregnant Jordanian women determined that 16 per cent of this sample reported being employed during the pandemic, as compared with 38.56 per cent of participants prior to the pandemic, with 60.59 per cent of participants describing a decline in family income in this time period.<sup>40</sup> Along these lines, a recent cross-sectional survey of service sector companies, including telecommunications companies, pharmacies, banks, insurance agencies, and others in Algeria found that, following the onset of the pandemic, 42 per cent of women as compared with only 9 per cent of men were put on leave; primary reasons for women's leave included pregnancy or childcare, whereas for men, the major reason was chronic disease.<sup>41</sup>

In addition to obvious economic consequences, these gender disparities in employment and unpaid labour have a direct impact on health, with implications for mental illness, food insecurity and malnutrition, as well as sexual- and gender-based violence (SGBV), as increasingly economically vulnerable women may depend financially upon their abusers. Further, this low participation in the formal workforce may exacerbate the already-enormous burden of unpaid domestic work that women experience, including informal caregiving, which may increase their exposure to and risk of COVID-19 illness. **Table 2** outlines baseline gender disparities in labour force participation and employment in Arab countries.

Encouragingly, there have been efforts among grassroots organizations and some Arab governments to address these gender disparities within the Arab region. Care International conducted a rapid analysis of 30 countries to determine gender compositions of national-level COVID-19 response teams, whether countries have applied a gender lens in COVID-19 response measures and whether there is a correlation between countries with greater female political representation and gender-sensitive responses to the pandemic.<sup>42</sup> Jordan was the singular Arab country included in this analysis and was one of nine countries offering subsidized childcare support. Furthermore, a civil society campaign in Jordan advocated for the right of government employees who were pregnant or who lacked childcare from being obligated to return to work. On a more local level, women's leadership groups primarily composed of refugee women have been conducting community-based awareness of COVID-19 preventive practices and the impact of the pandemic on mental health and domestic violence. Similar efforts have been put forth by local women's organizations in Lebanon, some of which are providing financial support to vulnerable women-headed households while others are utilizing in-person and virtual social networks to disseminate resources among camp-dwelling refugees.<sup>43</sup>

**Table 2. Gender disparities in labour force participation and employment<sup>iii</sup>, by country, most recent year available**

COUNTRY	Labour Force Participation (%)		Unemployment (% Labour Force)		Employment in Service Industry (%)		Employment in Informal Sector (%)	
	Women	Men	Women	Men	Women	Men	Women	Men
ALGERIA	14.6	67.0	20.5	9.6	73.2	57.1	--	--
BAHRAIN	44.6	87.4	3.2	0.2	91.4	57.4	--	--
DJIBOUTI	54.9	71.1	10.4	10.3	62.2	49.2	--	--
EGYPT	22.9	73.2	21.4	6.6	58	46.1	51.6	66.9
IRAQ	12.4	72.6	30.5	10.0	72.1	58.4	--	--
JORDAN	14.2	63.7	23.0	12.7	86.2	69.9	29.9	56.3
KUWAIT	57.3	85.3	5.6	1.2	96.7	66.5	--	--
LEBANON	23.5	71	9.8	5.1	72	61.9	55.5	55.3
LIBYA	25.7	79	24.7	15.5	67.1	56.1	--	--
MOROCCO	21.3	70.2	10.4	8.5	34.3	47.1	--	--
OMAN	35.6	82.3	7.1	0.8	95.6	59.7	--	--
PALESTINE	19.5	71.5	40.6	22.4	84.0	58.2	35.0	51.9
QATAR	57.9	95.9	0.5	0.1	93.8	37.5	--	--
KSA	23.5	79.5	22.5	2.7	97.6	69.2	--	--
SOMALIA	19.2	74.4	11.1	11.5	11.6	14.0	--	--
SUDAN	24.5	70.2	27.2	12.0	42.2	45.2	83.6	88.0
SYRIA	11.7	69.8	20.5	6.1	84.4	59.4	--	--
TUNISIA	23.9	69.7	22.7	13.8	58.1	53.7	--	--
UAE	51.1	93.4	6.0	1.7	94.6	58.2	--	--
YEMEN	5.8	70.9	24.5	11.9	43.2	62.7	82.2	77.1

Sources: UNdata (2022). <http://data.un.org/>; UN-Women – Women Count. <https://data.unwomen.org/data-portal/>; The World Bank (2022). Data-Bank: Gender Statistics. <https://databank.worldbank.org/source/gender-statistics>; PCBS (2020). [http://www.pcbs.gov.ps/portals/\\_pcbs/PressRelease/Press\\_En\\_15-4-2020-lab-en.pdf](http://www.pcbs.gov.ps/portals/_pcbs/PressRelease/Press_En_15-4-2020-lab-en.pdf); ILOSTAT (2022). <https://ilostat.ilo.org/>.

<sup>iii</sup> This data is not disaggregated by nationality and thus female labour force participation, particularly in the Gulf Cooperation Council countries, may be demonstrative of large populations of female foreign workers and not necessarily Arab women.

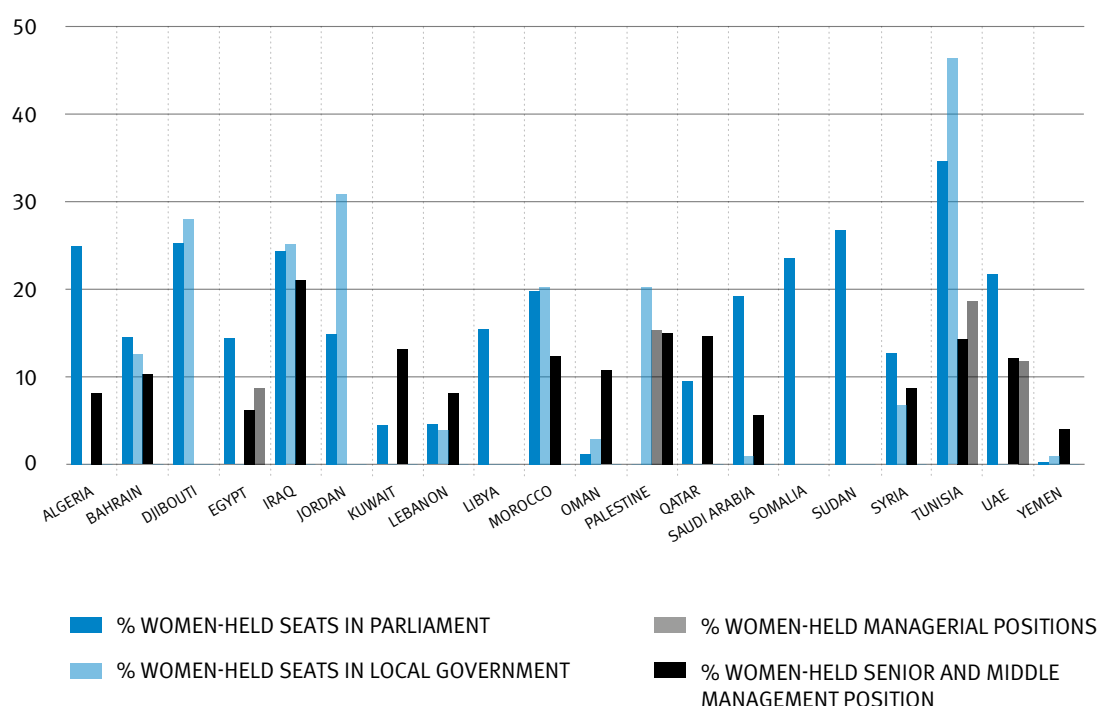
UNDP and UN Women have developed an interactive database of gendered policy responses to the pandemic at the national and regional level that includes the 20 Arab states.<sup>44</sup> Of these, Egypt is currently leading in terms of number of measures implemented. **Table 3** indicates gendered policy responses enacted, by country, as of 11 April 2021.

### SARS-CoV-2 Occupational Risk Exposure

Employed women in the Arab region are more likely than employed men to work in the service industry, which may increase their risk of COVID-19 exposure. Still, there are significant gaps in the available data, limiting our understanding of these risks. **Table 2** outlines gender ratios in service industry employment within the Arab states. **Section 7** of this report describes in detail female health care workers' unique risk of COVID-19.

Women's occupational susceptibility to COVID-19 is exemplified by the Beirut port explosion, which precipitated a nation-wide logarithmic rise in new COVID-19 cases.<sup>45</sup> In the aftermath of the explosion, women were represented, and perhaps overrepresented, in every sector of the response, providing health care, environmental support, case management, and other community-based services.<sup>46</sup> Yet while women occupied a notable physical presence on the ground, they were largely absent from higher-level decision-making processes between political representatives and international donors, reflecting long-standing political under-representation as women constitute only 4 per cent of the Lebanese parliament and 18 per cent of the national committee on COVID-19.<sup>47</sup> This economic and political marginalization can be observed in settings throughout the region and has major implications on policy responses to the pandemic as well as other crises. **Figure 6** illustrates gender disparities in political and economic participation throughout the Arab region.

**Figure 6. Baseline indicators of women's political and economic representation**



Source: UN-Women – Women Count (2022). <https://data.unwomen.org/>.

**Table 3. Gendered policy responses to the pandemic, by country**

COUNTRY	All Measures	Gender Sensitive Measures	Unpaid Domestic Work Measures	Violence Against Women Measures	Women's Economic Security Measures
ALGERIA	9	2	1	0	1
BAHRAIN	13	5	1	1	3
DJIBOUTI	9	2	0	0	2
EGYPT	48	25	4	12	9
IRAQ	12	3	0	3	0
JORDAN	25	7	1	5	1
KUWAIT	16	2	1	0	1
LEBANON	16	7	0	5	2
LIBYA	2	0	0	0	0
MOROCCO	22	9	0	5	4
OMAN	7	1	0	0	1
PALESTINE	34	19	1	12	6
QATAR	4	1	0	0	1
KSA	22	5	0	2	3
SOMALIA	2	1	0	0	1
SUDAN	4	2	0	0	2
SYRIA	10	3	0	2	1
TUNISIA	31	10	0	7	3
UAE	18	2	1	0	1
YEMEN	2	1	0	0	1

Source: UNDP (2020). Data Futures Platform: COVID-19 Global Gender Response Tracker. <https://data.undp.org/gendertracker/>.

### Severe COVID-19 Illness and Mortality Risk

There is limited COVID-19-related sex-disaggregated morbidity and mortality data in the Arab states. Among the 18 countries, none have publicly reported data on comorbidities, hospitalizations or ICU admission by sex; only seven have released sex-disaggregated mortality data since the onset of the pandemic.<sup>48</sup> These findings reflect global disparities in public reporting of sex-disaggregated morbidity and mortality data, as only 25 of 186 countries have ever reported hospitalization data by sex, while only 87 have ever released gendered mortality data.<sup>49</sup> Approximately 80 per cent of high- and upper-middle income countries surveyed provided sex-disaggregated mortality data, as compared with under a third of low- and lower-middle-income countries.<sup>50</sup>

Despite this scarcity of data, inferences regarding the COVID-19 risk for women in the Arab region may be drawn by considering their baseline risk factors for severe disease. For instance, higher rates of obesity and some non-communicable diseases among women in Arab countries as compared with other regions may mean they are at increased risk of severe COVID-19 disease and mortality.

In most Arab countries, beginning in the fourth decade of life, middle-aged women have a higher prevalence of hypertension than do men, a trend that is occurring nearly twenty years earlier than has been observed among women in the United States, China, and Europe.<sup>51</sup> One retrospective study of 228 (27 per cent female) patients with COVID-19 admitted to a hospital in the United Arab Emirates sought to determine the association between obesity and COVID-19 severity in this population, but found no significant association between BMI and COVID-19 clinical outcomes.<sup>52</sup> Notably, women were significantly more likely in this study than men to meet criteria for severe obesity (17 per cent of female participants vs. 3.3 per cent of male participants;  $p < 0.001$ ); investigators hypothesized that obesity may not confer a similar risk of severe COVID-19 in women as in men due to sex differences in fat deposition patterns. Another study of 439 (31.7 per cent female) patients hospitalized with COVID-19 at a single centre in Riyadh, Saudi Arabia found that though hypertension (56 per cent vs. 36 per cent), obesity (56 per cent vs. 35 per cent) and insulin use were more common among female participants ( $p < 0.001$ ), more men were hospitalized than women, possibly because of a large male population of migrant workers.<sup>53</sup> Despite these risk factors, however, investigators could not identify any significant differences in COVID-19 outcomes among men and women.

Similarly, high rates of tobacco use including waterpipe usage in the region may increase the risk of SARS-CoV-2 transmission and severe COVID-19 illness. Tobacco use is known to increase risk of COVID-19 severity and is an independent predictor of mechanical ventilation and admission to intensive care.<sup>54</sup> The association between tobacco use and severe COVID-19 illness and mortality may be additionally mediated by the relationship between tobacco use and cardiovascular disease.<sup>55</sup> Waterpipe use is also thought to facilitate SARS-CoV-2 transmission and illness severity both by virtue of tobacco as its main ingredient, but also through the sharing of instrumentation including mouthpieces, hoses, and water jars often among public groups in indoor settings.<sup>56</sup>

**Table 4** outlines baseline male:female (M:F) sex ratios in tobacco use and prevalence of non-communicable diseases associated with COVID-19 severity and mortality in other contexts for all countries within the Arab states for which data is available.

**Table 4. Baseline M:F gender ratios in population, tobacco use and NCD prevalence**

COUNTRY	Population (per 100)	Tobacco Use Prevalence (ages >18)	Obesity Prevalence (ages >18)	Diabetes mellitus Prevalence (ages >20)	CAD Prevalence (ages >20)
ALGERIA	102.1	25.9	0.57	0.88	1.56
BAHRAIN	179.9	4.8	0.69	0.98	1.45
DJIBOUTI	110.9	14.4	0.47	1.05	2.02
EGYPT	102.1	105.8	0.55	0.92	1.69
IRAQ	102.4	11.3	0.63	0.86	1.42
JORDAN	102.5	--	0.65	0.97	1.46
KUWAIT	155.9	12.0	0.73	1.08	1.89
LEBANON	101.3	1.4	0.74	0.91	1.39
LIBYA	102.0	--	0.63	0.91	1.49
MOROCCO	98.4	31.8	0.60	0.89	1.55
OMAN	194.1	26.4	0.68	1.14	1.28
PALESTINE	102.9	--	--	0.95	1.41
QATAR	302.4	20.5	0.75	1.20	1.85
KSA	136.6	15.6	0.73	0.92	1.64
SOMALIA	99.5	--	0.17	0.92	1.38
SUDAN	99.8	--	--	0.99	1.85
SYRIA	100.5	--	0.60	1.01	1.88
TUNISIA	98.3	16.9	0.56	1.01	1.50
UAE	225.3	32.0	0.67	0.93	1.61
YEMEN	101.5	3.5	0.55	0.87	1.54
WORLD	101.7	4.1	0.74	1.09	1.38

Sources: UN-Women – Women Count (2022). <https://data.unwomen.org/data-portal/>; The World Bank (2022). DataBank. <https://databank.worldbank.org/>; Institute for Health Metrics and Evaluation (2022). GBD Results Tool. <http://ghdx.healthdata.org/gbd-results-tool>; UNdata (2022). <https://data.un.org/>; WHO (2022). The Global Health Observatory. <https://www.who.int/data/gho/>.

## Gender-Based Differences in COVID-19 Knowledge, Sources of Information and Prevention

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We identified 72 peer-reviewed and six non-peer-reviewed studies that include a gender analysis of COVID-19 knowledge, attitude, and/or prevention practices in the Arab region.

Overall, the quality of evidence exploring COVID-19 knowledge, attitudes and behaviour is quite low, with cross-sectional web-based surveys of non-representative samples constituting the majority of the data. Despite the large number of studies published on this topic within a short timeframe, there is not yet clear data to support consistent, clinically significant gender differences in awareness, knowledge, or behaviours. The vast majority of these studies were conducted in Saudi Arabia (N=35) and Jordan (N=13). Many found no gender-based differences, while others found varying differences in COVID-19 knowledge in particular. Though some of these results were statistically significant, their public health significance is unclear, as the surveys used to assess knowledge were inconsistent, unvalidated, and frequently indicated only minimal differences among genders. Furthermore, whether gender differences in knowledge and beliefs translate into behaviours and risk of SARS-CoV-2 transmission is yet to be determined.

While the majority of the studies found that women reported greater adherence to recommended preventative practices, such results are subject to social desirability bias related as well to cultural norms in which women may be more likely to appear agreeable.

**Table A** outlines the peer-reviewed cross-sectional studies by country while **Table B** summarizes the reports published in the non-peer-reviewed 'grey' literature.

## Gender Disparities in Infection Prevention and Health Care Accessibility

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We have identified multiple potential determinants of infection prevention and health care accessibility that may influence women's risk of COVID-19 in the Arab states. **Table 5** outlines differences in health care resource availability by country.

### *Economic Barriers*

Prior to the pandemic, women in the Arab region were more likely than men to be unemployed or to work in the informal sector.<sup>57</sup> Informal work may contribute to health disparities by typically affording little to no protections such as health insurance or paid sick leave. Such disparities are further exacerbated in countries that have privatized, fragmented health systems with high out-of-pocket expenditures, where women may be forced to depend on overwhelmed public health systems. These economic barriers to health care accessibility are estimated to have worsened as a result of the pandemic, with 700,000 women projected to lose employment region-wide, reflecting disproportionate job loss in the informal sector and service industry.<sup>58</sup> Data from Palestine suggests that, while pandemic-related job loss may be similar among men and women, women and particularly female-headed households were more likely to experience a decline in family income,<sup>59</sup> reflecting trends observed in other regions. While the economic ramifications of the pandemic are outside the scope of this work, it is worth noting that this gendered loss of economic opportunities may significantly impact women's accessibility to testing and treatment of COVID-19 illness and also non-COVID-19 illness. This is related to women's economic dependence on their husbands, which has implications, too, on domestic violence. Further, such health disparities could confound sex-disaggregated incidence and mortality data, as women may be less likely to present for care and potentially more likely to die outside of health care facilities.

### *Older Age*

Data from the Pan-Arab Project for Family Health, under the auspices of the Arab league, indicate that 63 per cent of individuals aged 60 or above reported being the heads of their household, a trend that was true of 94 per cent of older men and 30 per cent of older women.<sup>60</sup> Such responsibility may be threatened in the context of a pandemic, in which older individuals are known to be

at greater risk. Older women and/or women with disabilities who face constraints to mobility for health or social reasons may be at greatest risk, with limited accessibility to health information or health care facilities.

In Lebanon, a cross-sectional study of 5,995 ever-married women aged 65 years and older demonstrated that 18 per cent lived alone.<sup>61</sup> In the wake of the August 2020 explosion of the Beirut port, a multisectoral needs assessment of 4,194 individuals living in the most heavily affected neighbourhoods found that approximately 13 per cent of respondents were women who lived alone, and that nearly 75 per cent of these were greater than 60 years of age.<sup>62</sup> Similarly, a recent study found that 25% of older women in Egypt and Tunisia lived alone.<sup>71</sup> These sub-populations of older women living alone may be particularly vulnerable not only to severe COVID-19 disease and mortality, but also to the economic consequences of the pandemic and more implicit threats to health, including mental illness. While such issues among older adults are currently being studied in the region, the lack of current data limits our understanding of this population's risk factors.

**Table 5. Resource availability by gender and country for most recent year available**

COUNTRY	Physician Availability (per 1000 pop)	Health Expenditure (%GDP)	Individuals Using Internet (per 100 individuals)		Mobile Phone Ownership (%)		Literacy Rate (% ages >15)	
			Female	Male	Female	Male	Female	Male
ALGERIA	1.8	6.4	42.9	55.1	--	--	75.3	87.4
BAHRAIN	0.9	4.7	99.3	99.9	100.0	100.0	94.9	98.8
DJIBOUTI	0.2	3.3	51.6	59.9	51.6	61.3	--	--
EGYPT	0.5	5.3	53.0	61.5	97.1	98.5	65.5	76.5
IRAQ	0.7	4.2	51.2	98.3	56.7	83.1	79.9	91.2
JORDAN	2.3	8.1	--	--	--	--	97.8	98.6
KUWAIT	2.6	5.3	99.6	99.5	--	--	94.9	96.7
LEBANON	2.1	8.2	--	--	--	--	93.3	96.9
LIBYA	2.1	6.1	--	--	--	--	77.8	93.8
MOROCCO	0.7	5.2	70.2	78.6	91.7	91.6	64.6	83.3
OMAN	2.0	3.8	97.2	94.4	--	--	93.2	97.4
PALESTINE	--	--	68.9	72.3	65.3	81.8	95.7	98.6
QATAR	2.5	2.6	99.3	100.0	--	--	94.2	92.9
KSA	2.6	5.8	94.6	96.5	92.0	95.9	92.7	97.1
SOMALIA	0	--	--	--	--	--	--	--
SUDAN	0.3	6.3	11.0	16.9	54.2	70.3	56.1	65.4
SYRIA	1.3	3.6	--	--	--	--	73.6	87.8
TUNISIA	1.3	7.2	61.1	72.5	--	--	72.2	86.1
UAE	2.5	3.3	99.5	99.0	99.4	99.4	95.1	92.6
YEMEN	0.5	4.2	--	--	--	--	35.0	73.2

Sources: UNdata (2022). <http://data.un.org/>; The World Bank (2022). DataBank: Gender Statistics. <https://databank.worldbank.org/source/gender-statistics>; UN-Women – Women Count. <https://data.unwomen.org/>; ITU (2022). Statistics. <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>.



## Literacy Gap

With a region-wide average adult female literacy rate of 67 per cent as compared with men's 81 per cent, women may not have equal access to public health information about the virus, which may influence their risk.<sup>63</sup> A mixed-methods gender analysis of the pandemic conducted by Oxfam of 207 members of the general public and 20 key informants across three governorates in Iraq showed that women have less access to pandemic-related information than men do.<sup>64</sup> This disparity was attributed to higher levels of illiteracy among women, with 2.3 million women representing 70 per cent of the Iraqi population unable to read, and gender inequities in internet accessibility. Indeed, illiteracy has been shown to be a risk factor for COVID-19, with one study from Iraqi Kurdistan demonstrating that illiterate individuals were less likely to report adherence with preventative practices ( $p < 0.001$ ) and seek medical attention for COVID-19 symptoms ( $p < 0.001$ ).<sup>65</sup> Women were more likely than men to rely on word-of-mouth from neighbours and relatives or on television for COVID-19-related information. Despite these disparities in prevention resources, women and men showed roughly similar levels of COVID-19-related knowledge. Yet women were more likely to report difficulty adhering to certain preventive measures due to costs. In one governorate, 10 per cent of respondents, all of whom were women, did not have access to clean water and 57 per cent, the majority of whom were women, did not have access to other disinfectants.<sup>66</sup> Key informants reported that men and boys were less likely to adhere to social distancing recommendations than women, reflecting similar trends observed elsewhere.

## Internet Accessibility

In the same gender analysis of COVID-19 in Iraq, 51 per cent of Iraqi women as compared with 98% of Iraqi men surveyed reported being able to access the internet.<sup>67</sup> Gender disparities in internet accessibility are reflected elsewhere in the Arab region, where approximately half of the 84 million female residents lack internet connectivity or a personal mobile phone.<sup>68</sup> Such figures represent a regional gender gap in internet accessibility of 14 per cent in 2019, which is 100 per cent greater than the worldwide average.<sup>69</sup> In Palestine, for instance, 35 per cent of male-headed households, as compared with only 19 percent of female-headed households, reported owning a computer.<sup>70</sup> In a qualitative study of 100 Syrian, Palestinian, and Jordanian adolescents living in Jordan, girls demonstrated comparatively limited knowledge of SARS-CoV-2, possibly in relation to restricted mobile phone and internet accessibility.<sup>71</sup>

## Marriage

Marriage has been shown to be the most significant predictor of HIV infection among women in Morocco.<sup>72</sup> It is possible that marriage may similarly increase women's risk of COVID-19 illness through SARS-CoV-2 transmission from an infected spouse, though it has not yet been studied as an independent predictor of COVID-19 illness. However, a cross-sectional survey of 1,517 adult women in Egypt found that a majority of women feared they would contract the virus from their spouse.<sup>73</sup> The study, conducted on a nationally representative sample, showed that 58 per cent of women felt that other household members were unaware that "leaving the house frequently" could increase their risk of infection, and 50 per cent were concerned that their husband specifically may expose them to the virus due to carelessness, which raises the question of whether marriage may be a risk factor for COVID-19 among Egyptian women.

## Stigma

In Iraq, stigma has been cited as a major deterrent to seeking health care. Interestingly, stigmatization of infection is gendered, with one study indicating that men are "pitied" when thought to be infected, whereas women are "blamed" and perceived to have engaged in careless activity that led to infection.<sup>74</sup> This has led many women to deliberately evade necessary medical care in order to avoid shame.<sup>75</sup> Similarly, there have been at least 62 cases reported of women with COVID-19 being denied hospitalization by their families for fear of generating stigma.<sup>76</sup> This fear of hospitalization has become so pervasive that the Iraqi military is forcefully imposing testing and facility-based quarantine onto suspected cases, which is in turn perceived by the community as a criminalization of those infected and thereby exacerbating the stigma.<sup>77</sup> A cross-sectional study investigating COVID-19 stigmatization among a non-representative sample of 1,655 Jordanian adults (63.8 per cent female) found a 64 per cent prevalence of stigma and indicated that sex was a significant predictor of stigma ( $p < 0.001$ ), but did not specify whether male or female.<sup>77</sup>

There may be many reasons for this stigma. Distrust in the country's fragile health systems, further weakened by decades of conflict and economic sanctions, is exacerbated by gender norms restricting the movement of wives and daughters outside of their homes, with particular avoidance of settings such as hospitals where those with suspected or confirmed infection are not

segregated by gender.<sup>78</sup> Several physicians have reported speaking with family members who refuse their female relatives the opportunity to seek medical care for COVID-19 because of these concerns.<sup>79</sup> In many parts of the region, gender norms dictate that women obtain permission from male relatives prior to seeking medical care, which may restrict their health care accessibility.

A cross-sectional study of 753 adults (40 per cent female) residing in Iraq sought to determine attitudes and perspectives of members of the general public toward COVID-19-related stigmatization using a newly developed COVID-19 stigma scale.<sup>80</sup> The study found no differences were observed between male and female participants. Notably, the scale itself does not include any questions regarding gender-based differences in COVID-19 stigmatization.

### *Inability to Quarantine*

Quarantine facilities in Palestine, erected for workers returning from Israel to safely self-isolate prior to reuniting with their families, failed to account for women's unique needs such as private spaces and hygiene and dignity kits.<sup>81</sup> Similar issues surrounding lack of privacy and safe spaces for women have been anecdotally reported by public health professionals operating isolation centres in Lebanon. Of the 551 isolation beds among seven geographically diverse, operational isolation centres, only 106 – just 19 per cent – were occupied as of 22 January 2021, while the country was confronting a severe surge of COVID-19.<sup>82</sup>

## **Sex Differences and Gender Disparities in COVID-19 Testing, Incidence, Morbidity and Mortality**

Based on a minority of COVID-19 cases, as of 1 June 2020, men in the Arab region were observed to have double the COVID-19 mortality rate of women and nearly four times the rate of morbidity.<sup>83</sup> However, approximately 75% of confirmed COVID-19 cases in the region were not disaggregated by sex, making it challenging to draw any conclusions from this data. As of January 2021, four of the 20 Arab states have publicly released sex-disaggregated COVID-19 prevalence data and seven have provided sex-disaggregated COVID-19 prevalence and mortality data at some point since the onset of the pandemic. However, the dissemination of gendered data has been inconsistent across countries and over time. In fact, of all the Arab states, only Iraq has regularly provided comprehensive incidence and mortality data stratified by multiple indicators including sex, health care worker status, comorbidities, and sub-national region. **Table 6** outlines COVID-19 cases and deaths disaggregated by gender for Arab states in which data is available.

### *Testing*

While no country in the region has consistently released up-to-date, gender-disaggregated data on testing, the available evidence from Somalia and Palestine suggests that women are underrepresented among the number of diagnostic tests conducted. In Somalia, unpublished data as of 19 September 2020 indicates that only 32 per cent of all SARS-CoV-2 PCR tests administered were conducted on women.<sup>84</sup> Similarly, in Palestine, women accounted for just 34 per cent of all SARS-CoV-2 tests conducted in Palestine as of 21 September 2020.<sup>85</sup> Similarly, in Bahrain, a high-income member-state of the Gulf Cooperation Council (GCC), women accounted for just 37.9 per cent of all 38,092 SARS-CoV-2 tests administered through 25 April 2020.<sup>86</sup> These findings are notably distinct from those observed in Western countries in which women were the majority of SARS-CoV-2 testing recipients,<sup>87</sup> emphasizing the need for sex-disaggregated data in Arab countries over time to inform a contextualized public health response.

### *Prevalence*

Eleven of the 20 Arab states have publicly released sex-disaggregated data on COVID-19 cases at some point since the onset of the pandemic. As noted in **Table 6**, this reporting has been sporadic, with some countries failing to release new data since June 2020. Peer-reviewed studies have similarly inconsistent data. For instance, a secondary analysis of all COVID-19 cases recorded by the Saudi Ministry of Health database from March to June 2020 provides gender-stratified data only for the period between 2 and 25 May 2020, during which time cases among women increased by 150%.<sup>88</sup>

While it is difficult to interpret prevalence data in the absence of testing data, gender ratios of confirmed COVID-19 cases in most countries correlate with population gender ratios, as illustrated in **Figure 7**, suggesting roughly similar prevalence among men and women. Notable exceptions to this trend are observed in Bahrain, Djibouti, Oman, Somalia and Yemen, where the overwhelming male majority of COVID-19 cases far outnumbers men's population majority. In Djibouti, for instance, men accounted for 68.4 per cent of the 1,401 COVID-19 cases reported to the Ministry of Health during the first two months of the pandemic.<sup>89</sup> Similarly,

a meta-analysis of WHO-EMRO data from the first four months of the pandemic found that M:F COVID-19 case ratios observed in GCC countries including Bahrain (183.1), Kuwait (157.9), Qatar (302.4), Saudi Arabia (137.1) and the UAE (223.9) were all above what would be expected given their population gender ratios.<sup>90</sup> In Oman, a retrospective study exploring the epidemiologic characteristics of the first 1,304 COVID-19 cases (19.7 per cent) reported to the Ministry of Health similarly found that men were significantly over-represented in the study ( $p<0.001$ ).<sup>91</sup>

Still, other studies have demonstrated worse outcomes among men. A retrospective study of 786 individuals (23.3 per cent female) with COVID-19 admitted to the King Saud Medical City Hospital in Riyadh, Saudi Arabia found that male patients had a greater likelihood of ICU admission than did female patients ( $p=0.01$ ).<sup>94</sup> Another study of all laboratory-confirmed COVID-19 cases with definitive clinical outcomes in Saudi Arabia in March 2020 ( $N=648$ ; 47 per cent female) found that, though gender distribution was roughly equal (47.2 per cent female vs. 52.8 per cent male), men were more likely to develop severe disease (67.5 per cent of men vs. 32.5 per cent of women;  $p=0.006$ ).<sup>95</sup> Notably, these findings were not stratified by nationality. Similarly, a retrospective cohort of 145 patients (48.2 per cent female) with COVID-19 admitted to a university hospital in Casablanca, Morocco, found that men were over three times as likely as women to have severe disease (OR 3.35; 95 per cent CI 1.20-9.36).<sup>96</sup> In Iraq, a retrospective study of 192 patients (56.2 per cent female) with COVID-19 pneumonia presenting to a single centre identified female sex as predictive of complete recovery from pneumonia (OR 0.2; 95 per cent CI 0.1-0.4;  $p=0.009$ ).<sup>97</sup> The investigators hypothesize that their results are likely reflective of sex-based immunological differences as well as gender-based differences in baseline NCD prevalence and tobacco use, and conclude that there is a need for more research on gendered outcomes of COVID-19.

**Table 6. Sex-disaggregated COVID-19 cases and deaths by country\***

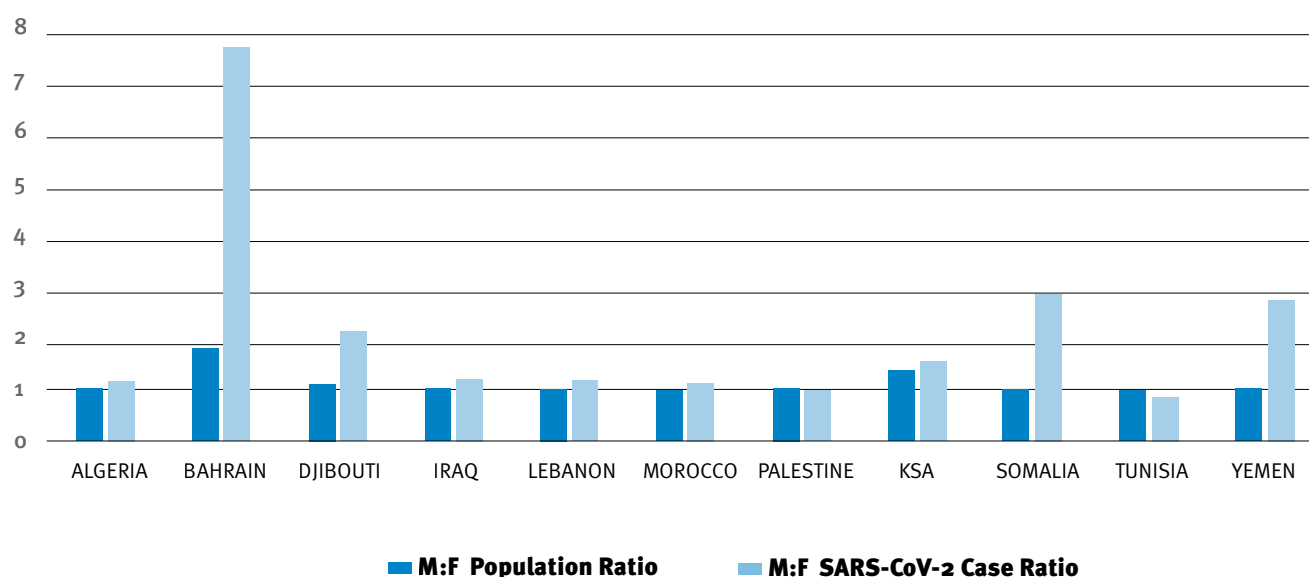
COUNTRY	Sex-disaggregated data availability	Cases available for sex-disaggregation	Date of most recent disaggregation, as at December 31, 2020	Confirmed SARS-CoV-2 Cases (%)		Deaths available for sex-disaggregation, as at December 31, 2020	Date of most recent disaggregation	Proportion of Confirmed COVID-19 Deaths (%)	
				Female	Male			Female	Male
ALGERIA	Partial	55,630	12-Nov-2020	46.2	53.8	0	--	--	--
BAHRAIN	Partial	6,081	06-Jul-2020	11.6	88.4	0	--	--	--
DJIBOUTI	Partial	3,779	02-Jun-2020	32.0	68.0	0	--	--	--
IRAQ	Full (Updated)	602,938	11-Jan-2021	45.4	54.6	12,895	11-Jan-2021	33	67
LEBANON	Full (Outdated)	218,296	10-Jan-2021	46.0	54.0	36	06-Jul-2020	69	31
MOROCCO	Full (Outdated)	17,015	18-Jul-2020	47.0	53.0	1,855	21-Sep-2020	34	66
PALESTINE	Full (Outdated)	165,250	09-Jan-2021	50.4	49.6	266	21-Sep-2020	39	61
KSA	Partial	2,996	15-Nov-2020	39.0	60.1	0	--	--	--
SOMALIA	Full (Outdated)	4,579	15-Dec-2020	26.0	74.0	3,442	19-Sep-2020	28	72
TUNISIA	Full (Outdated)	42,727	20-Oct-2020	54.0	46.0	77	30-Aug-2020	31	69
YEMEN	Full (Outdated)	1,897	21-Jul-2020	26.8	73.2	584	15-Sep-2020	23	77

\*Sex-disaggregated data not available for Egypt, Jordan, Kuwait, Libya, Sudan, Syria and UAE.

Source: The Sex, Gender and COVID-19 Project (2022). The COVID-19 Sex-Disaggregated Data Tracker. <https://globalhealth5050.org/the-sex-gender-and-covid-19-project/the-data-tracker/>

There are many potential reasons for these trends. Firstly, in the case of Somalia, we have evidence supporting a gender gap in the number of SARS-CoV-2 PCR tests conducted. The same is true of Bahrain. Secondly, and particularly relevant among the oil-rich GCC states, male migrant workers living in overcrowded settings in Gulf countries may be at greater risk of both SARS-CoV-2 transmission and delayed presentation to care, potentially driving the observed male majority. In the Oman study, for instance, the male majority could be explained by an overwhelming majority (>60 per cent) of non-Omani individuals, primarily from India, Bangladesh and Pakistan. In contrast, Yemen and Djibouti are both low-income countries and, in the case of Yemen, a setting of active armed conflict. Women may be less likely in these resource-constrained contexts to independently access health care, which may be influencing these observed disparities.

**Figure 7. A comparison of population and COVID-19 case gender ratios for countries where data is available**



Sources: UN Department of Economic and Social Affairs (2019), World Population Prospects. The Sex, Gender and COVID-19 Project (2022). The COVID-19 Sex-Disaggregated Data Tracker. <https://globalhealth5050.org/the-sex-gender-and-covid-19-project/the-data-tracker/>

## Morbidity

While none of the Arab states publicly reports sex-disaggregated hospitalization data, there have been several retrospective cohort and case series studies that included a sex analysis of severity and clinical manifestations of COVID-19 illness. Many detected no statistically significant sex-based differences in COVID-19 symptomatology or outcomes. For example, a multi-centre retrospective study of 401 patients (20 per cent female) admitted to five hospitals in Riyadh, Saudi Arabia with COVID-19 found no significant gender-based differences in disease severity.<sup>92</sup> Another retrospective study of 806 individuals (45.3 per cent female) with COVID-19 and type 2 diabetes mellitus in Riyadh found no sex differences in hospitalization rates.<sup>93</sup>

In contrast with these findings, in Egypt, a retrospective cohort study of 66 patients with COVID-19 infection admitted to a single institution found that, though women represented just 27.3 per cent of the sample, they accounted for 33.3 per cent of severe infections, and that sex was not an independent predictor of COVID-19 severity in binary logistic regression models<sup>98</sup> Another retrospective study of 140 patients (28.57 per cent female) with COVID-19 admitted to a hospital in Baghdad, Iraq showed minor differences in symptomatology among men and women; women were more likely than men to have both gastrointestinal and respiratory symptoms ( $p < 0.0001$ ) whereas men were more likely to have only gastrointestinal symptoms ( $p < 0.0001$ ), though investigators did not report differences in illness severity or mortality among genders.<sup>99</sup>

It is challenging to draw conclusions from these studies given the fairly low sample size and cross-sectional design. Sex differences should be studied in longitudinal, prospective studies that allow for the evaluation of both short- and long-term symptoms of COVID-19 and severity of this disease in order to understand the pathogenesis in this population and inform clinical decision-making.

Several other studies have investigated sex differences in the known clinical sequelae of SARS-CoV-2 infection. A multinational study of the short-term risk of stroke among hospitalized patients with COVID-19 was conducted among 17,799 patients across 99 tertiary care centres in 11 countries and included two public institutions in Beirut which at the time cared for roughly two-thirds of COVID-19 cases in Lebanon.<sup>100</sup> Though the study results were not stratified by country, the investigators found that 0.9 per cent of the sample suffered from a stroke, and that women accounted for 46 per cent of ischemic strokes, 30 per cent of intracranial haemorrhages, and 67 per cent of cerebral venous thromboses. Notably, gender was not found to be a predictor of stroke in this population.

Another study examining cerebrovascular disease in the context of COVID-19 found that, among 130 patients (27.7 per cent female) hospitalized at a single centre in the UAE during the first three months of the pandemic, approximately one quarter tested positive for SARS-CoV-2.<sup>101</sup> Interestingly, women accounted for 31.8 per cent of non-COVID-19 ischemic stroke admissions but only 5.3 per cent of patients with stroke and COVID-19 ( $p=0.016$ ), a finding that investigators attribute to over-representation of male migrant workers among patients with COVID-19.

A study of 118 COVID-19 patients (44 per cent female) admitted to a hospital in Casablanca sought to determine the cardiac sequelae of hydroxychloroquine and azithromycin use, and interestingly found that being male was associated with specific electrocardiogram abnormalities (observed in 73.9 per cent of men versus 26.1 per cent of women;  $p=0.043$ ).<sup>102</sup> A retrospective study exploring cardiac injury among a sample of 203 (25.6 per cent female) patients with COVID-19 admitted to a hospital in Dubai found that 27.1 per cent of patients developed acute cardiac injury, which was found to be associated with worse clinical outcomes including death ( $p<0.001$ ). While these outcomes were not stratified by gender, men were significantly more likely than women to be diagnosed with acute cardiac injury (27.2 per cent of men vs. 7.7 per cent of women;  $p<0.005$ ).<sup>103</sup>

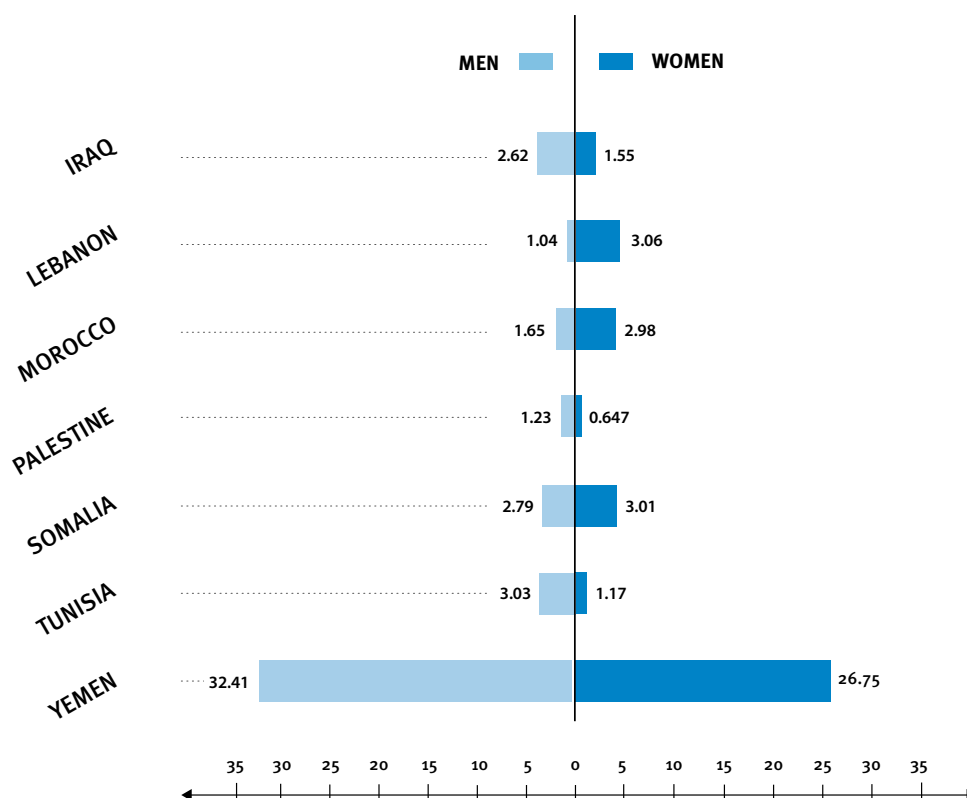
## Mortality

Several studies have examined sex differences in COVID-19 mortality in the Arab region. A multicentre randomized clinical trial of hydroxychloroquine conducted in Egypt among 194 hospitalized patients (41.2 per cent female) found no statistically significant mortality differences among men and women, though age, inflammatory markers, and hypoxia were identified as significant correlates of death.<sup>104</sup> A retrospective study of 352 patients (12.8 per cent female) with COVID-19 admitted to the ICU at a single centre in Saudi Arabia found no association between sex and COVID-19 mortality.<sup>105</sup> Another, larger study of 1,422 patients (22.29 per cent female) hospitalized with COVID-19 during the first three months of the pandemic in Saudi Arabia determined no statistically significant gender-based differences in mortality, though when stratified by mechanical ventilation status, women had a slightly higher probability of survival among both non-mechanically ventilated (0.797; 95 per cent CI 0.716-0.856 vs. 0.771; 95 per cent CI 0.584-0.881;  $p<0.0001$ ) and mechanically ventilated patients (0.076; 95 per cent CI 0.034-0.141 vs. 0.172; 95 per cent CI 0.047-0.362;  $p<0.0001$ ), though this difference was miniscule.<sup>106</sup>

Notably, there are marked differences in the observed case fatality rates (CFRs) across different Arab states. **Figure 8** demonstrates sex-disaggregated CFRs for the seven countries for which there is data. In Somalia, for instance, where women account for roughly a third of all tests and confirmed COVID-19 cases, women exhibited an attack rate nearly equal to that of men (11 per 100,000 among women versus 12 per 100,000 among men).<sup>107</sup> Along these lines, though women accounted for just 28 per cent of COVID-19-related deaths in Somalia, they exhibited a higher CFR than men, of 3.01 per cent compared with 2.79 per cent.<sup>108</sup> By contrast, in Tunisia, despite similar COVID-19 incidence across gender, Tunisian men have been observed to have a COVID-19 mortality rate roughly three times higher than that of women.<sup>109</sup>

Similarly, a retrospective study of 768 inpatients (23.3 per cent female) treated for COVID-19 at the King Saud Medical City Hospital in Riyadh found that the men exhibited a CFR nearly twice that of women (6.7 per cent vs. 13.1 per cent;  $p=0.019$ ).<sup>110</sup> It is worth noting that the vast majority of study participants were non-Saudi (75.5 per cent;  $N=580$ ), suggesting that foreign migrant workers accounted for the majority of cases observed in this study. It is possible that overcrowded living conditions among this primarily male population may have contributed to higher initial viral load exposure and consequently greater complications among men in this study, as suggested by the association of non-Saudi nationality with mortality in this study ( $p=0.018$ ).<sup>111</sup> In Yemen, one retrospective analysis of surveillance data found that women accounted for just 25 per cent of cases and yet had a case fatality ratio notably higher than that of men (27.1 per cent vs. 22.5 per cent), possibly reflecting gender disparities in health care accessibility.<sup>112</sup>

**Figure 8. Sex-disaggregated COVID-19 case fatality ratios (%)**



Source: The Sex, Gender and COVID-19 Project (2022). The COVID-19 Sex-Disaggregated Data Tracker. <https://globalhealth5050.org/the-sex-gender-and-covid-19-project/the-data-tracker/>

Note: A case fatality rate (CFR) presents the number of deaths divided by the number of confirmed cases of COVID-19 (people who have been tested and confirmed as having a COVID-19 infection).

These differences, which do not appear to correlate with population health data on underlying NCDs or smoking use, are likely related to the relative paucity of data, limiting our ability to observe trends in mortality over time. For instance, in Lebanon, a brief from the WHO country office posted on social media in July 2020 indicated that women represented 69 per cent all COVID-19-related deaths in the country.<sup>113</sup> Sex-disaggregated mortality data of all COVID-19 deaths has not been released since that time, making it difficult to draw inferences. However, more recent sex-disaggregation of daily COVID-19 deaths in Lebanon indicated that women accounted for 45 per cent of deaths on 20 January 2021.<sup>114</sup> In contrast to the centralized database in Iraq, there are multiple dashboards exhibiting COVID-19-related data in Lebanon, including those which contain sex-disaggregated data that are password-protected and therefore not readily available to the public.

It is challenging, too, to compare mortality trends observed in the Arab region with those reported elsewhere. Given that, early on, the pandemic disproportionately impacted high-income countries with comparably greater gender parity and, in some instances, universal health care, the sex-based differences observed in morbidity and mortality in such settings are unlikely to be entirely attributable to differential health care accessibility. Yet, in some Arab countries, where data suggests equal or possibly even greater mortality rates among women, disparities in health care accessibility may be a major determinant of survival.

# Section 4

## Gendered Impact of the COVID-19 Pandemic on Mental Health

### Introduction

Prior to the pandemic, mood and anxiety disorders were highly prevalent in the Arab states, particularly among conflict-affected populations, with depression being a major cause of morbidity among women specifically.<sup>115</sup> The burden of mental illness in the region, and particularly among women, is estimated to have risen markedly in the setting of the pandemic.

In Tunisia, for instance, the Ministry of Public Health established a mental health unit specifically to address the psychiatric sequelae of the pandemic and, in roughly the first month of the lockdown alone, received over 1,269 calls from women as compared with 841 calls from men.<sup>116</sup> Increasing social isolation may be a risk factor especially among the elderly, many of whom live alone in countries like Lebanon, where old-age institutions are uncommon and a significant proportion of the younger population has emigrated.<sup>117</sup>

Ongoing humanitarian crises including protracted conflict, forced displacement, political violence, and economic collapse, all occurring in a resource-limited context characterized by the world's lowest per capita availability of mental health services,<sup>118</sup> exacerbate the mental illness risk posed by the pandemic within the Arab region.

### Gender Differences in Perceived Stress

Several studies throughout the region have demonstrated that women are more likely than men to perceive stress related to the pandemic.

For instance, a cross-sectional study of 3,036 Saudi and non-Saudi adults, including 950 health care workers, living in geographically diverse regions of Saudi Arabia, found that men were less likely to report overall COVID-19 related distress (OR 0.063;  $p=0.019$ ) as well as "severe" COVID-19 related distress (OR 0.023;  $p=0.011$ ).<sup>119</sup> Other predictors of distress included being a health care worker, being of younger age and working in the private sector. Another cross-sectional survey of 1,160 adult members of the Saudi general public (63.9 per cent female) found that women were more likely than men to report high levels of traumatic distress (B 5.46; 95 per cent CI 3.61-7.31;  $p<0.001$ ) and perceive high stress levels (B 2.63; 95 per cent CI 1.30-3.90;  $p<0.001$ ) in relation to the COVID-19 pandemic.<sup>120</sup>

In Iraqi Kurdistan, a cross-sectional survey of 1,343 adults (45.4 per cent female) found no statistically significant gender-based differences regarding fear of COVID-19, though interestingly illiteracy was correlated with higher levels of fear ( $p<0.001$ ).<sup>121</sup> In Egypt, a cross-sectional study of 1,629 Egyptian adults found that nearly half of study participants reported increased stress as a result of the pandemic, with women nearly three times more likely than men to exhibit "severe to very severe stress" (OR 2.90; 95 per cent CI 2.04-4.11).<sup>122</sup> Similarly, among a non-representative sample of 1,033 Jordanian adults (66.2 per cent female) that included health care workers, women were found to be more likely to report stress (Unstandardized B 2.3; 95 per cent CI 1.8-3.0;  $p<0.001$ ), with common stressors including concerns regarding university studies (32.7 per cent), fears about infecting a relative (30.5 per cent) or personally becoming infected (18.7 per cent) and worries about income loss (23.9 per cent), food insecurity (22.2 per cent) and medication insecurity (18.7 per cent).<sup>123</sup>

In Lebanon, a country experiencing simultaneous public health, economic, and political crises, female gender was identified as a major predictor of stress (B 4.520; 95 per cent CI 2.365-6.675;  $p<0.001$ ), as were physical violence at home ( $p<0.001$ ), fear of treatment inaccessibility ( $p=0.008$ ), fear of COVID-19 ( $p<0.001$ ), having a relative with a chronic disease ( $p=0.027$ ), and decline in socio-economic status ( $p=0.004$ ).<sup>124</sup>

The gendered impact of the pandemic on perceived stress has also been studied among subpopulations of individuals with chronic diseases. A recent cross-sectional survey of over 2,000 adults (72 per cent women) with rheumatologic disease across 15 Arab countries found that 73 per cent of respondents associated the pandemic with a negative impact on their mental health, including 25 per cent who described a "major" impact.<sup>125</sup> Individuals who needed to isolate as a result of COVID-19 exposure



were more likely to report poor mental health impact (OR 2.45; 95 per cent CI 1.86-3.25  $p < 0.001$ ).<sup>126</sup> A cross-sectional survey of 394 individuals (42.9 per cent female) with type two diabetes mellitus living in Jeddah, Saudi Arabia found that women had more symptoms of psychological distress related to the pandemic than did men (mean score 10.35 vs. 9.03;  $p = 0.002$ ).<sup>127</sup> In contrast, a cross-sectional study of 1,255 patients (74 per cent female) with inflammatory bowel syndrome (IBS) who live in Saudi Arabia found that, while overall rates of stress were high at 63.4 per cent, and that this stress was perceived to worsen IBS symptoms among 56.6 per cent of this sample, no gender-based differences were detected in pandemic-related perceived stress.<sup>128</sup>

Adolescent populations of women and girls have similarly been shown to disproportionately report an increase in pandemic-related stress, a trend that may be related to disruptions in education, fears of contracting the virus, increased domestic work conflicting with education responsibilities and gender norms in patriarchal contexts that restrict women's agency.

For instance, a cross-sectional study of 1,851 students (62 per cent female) at Birzeit University in Palestine found that women were significantly more likely than men to report distress (OR 1.63; 95 per cent CI 1.33-1.99;  $p < 0.001$ ) and insecurity (OR 1.47; 95 per cent CI 1.2-1.81;  $p < 0.001$ ).<sup>129</sup> A longitudinal survey of 4,100 Syrian, Palestinian, and Jordanian adolescents found that 59 per cent of this cohort described experiencing fear related to the pandemic, a sentiment most commonly reported by older female adolescents (62 per cent), as compared with their male counterparts (47 per cent). Among married female adolescents, this number was even higher (69 per cent).<sup>130</sup> A cross-sectional study of 367 secondary school and university students (74.7 per cent female) attending virtual classrooms across five regions in Saudi Arabia found that 52.9 per cent of female participants perceived moderate stress levels, while 33.9 per cent perceived high stress levels, in contrast to only 19.4 per cent of male respondents ( $p < 0.05$ ).<sup>131</sup> Female participants demonstrated higher mean perceived stress scores than did men (22.75 versus 20.27;  $p = 0.003$ ).

Interestingly, a cross-sectional study examining the psychological impact of the pandemic on 382 university faculty (44.5 per cent female) in Jordan found that roughly a third of participants reported severe distress, but that there was no association with gender observed.<sup>132</sup> Similarly, among 520 undergraduate students (61.3 per cent female) attending a public university in Lebanon, women had higher mean stress scores than men ( $p < 0.01$ ) but no gender-based differences were observed in anxiety or depression.<sup>133</sup>

## Gender Disparities in Mood and Anxiety Disorders

Numerous studies have demonstrated an overwhelming and gendered increase in mood and anxiety disorders since the onset of the pandemic among nationally representative and diverse populations of women living in the Arab states.

One multi-national cross-sectional study of 1,057 young people (71.5 per cent female) ages 15-24 living in Egypt, the UAE, Iraq, Saudi Arabia, Jordan and Oman determined the prevalence of depression in this cohort to be 57 per cent and anxiety 40.5 per cent, with female gender a significant predictor of stress, depression and anxiety ( $p < 0.001$ ).<sup>134</sup> Notably, quarantining for 14 days was also identified as a predictor of mental illness. Women in this study were found to have higher mean depression (14.1 vs. 10.9), anxiety (8.3 vs. 5.9) and stress (14.5 vs. 10.7) scores than did men.<sup>135</sup> In Kuwait, a cross-sectional study of 4,132 adults (69.31 per cent female) that sought to determine the psychological impact of the pandemic and predictors of mental illness among a nationally representative sample of the general public using validated mental health scales found that women were more than twice as likely as men to have depression (OR 2.06; 95 per cent CI 1.72-2.48;  $p < 0.001$ ) or generalized anxiety (OR 2.11; 95 per cent CI .71-2.52;  $p < 0.001$ ).<sup>136</sup>

A cross-sectional study done on a convenience sample of 256 Moroccan adults (56.6 per cent female) which sought to identify an association between authorization to leave one's home and mental illness, found that women exhibited more severe symptoms of anxiety ( $p < 0.001$ ), depression ( $p < 0.001$ ), obsessive-compulsivity ( $p < 0.001$ ), paranoid ideation ( $p < 0.001$ ), and somatization ( $p < 0.001$ ) as compared with men, and that such findings are possibly related to diminished physical activity.<sup>137</sup> Reasons for this gender disparity in mobility are unclear, though such findings suggest that in addition to pre-existing sociocultural norms, new pandemic-related legal barriers may selectively limit women's mobility in some Arab countries, with a significant impact on mental health.

A study done on a representative sample of 944 pregnant Jordanian women found that over 40 per cent of participants reported experiencing symptoms of depression related to the lockdown, while approximately 1 per cent of the sample ( $N = 9$ ) endorsed suicidal ideation.<sup>138</sup> Another cross-sectional study on a large though non-representative sample of 5,274 Jordanian adults (55.3 per cent female) found that 38.4 per cent of the sample experienced some form of anxiety, and that women were more likely than men to report mild (24.5 per cent vs. 17.9 per cent), moderate (13.0 per cent vs. 8.3 per cent) and severe (8.0 per cent vs. 3.5 per cent) anxiety ( $p < 0.01$ ) as compared with men.<sup>139</sup> In multivariate analysis, female gender was associated with anxiety ( $\beta = 0.47$ , 95 per cent CI: 0.34 to 0.59), leading authors to hypothesize that women "worry about their worries" and therefore propagate cycles of anxiety.<sup>140</sup>



Likewise, a multi-national study of 2,166 social media users (59.7 per cent female) in the Arab Gulf region determined that women were roughly twice as likely than men to meet criteria for depression (aOR 2.03; 95 per cent CI 1.65-2.51;  $p < 0.05$ ) and anxiety (aOR 1.47; 95 per cent CI 1.20-1.82;  $p < 0.05$ ).<sup>141</sup> Another cross-sectional study of 894 adults (41.6 per cent female) living in the Kurdistan region of Iraq found that while the vast majority of participants described some depressive or anxiety symptoms, women had more severe depression (4.06 vs. 3.93;  $p = 0.003$ ) and anxiety scores (4.12 vs. 3.97;  $p = 0.001$ ) specifically related to pandemic than did men.<sup>142</sup> Similarly, a longitudinal cohort study of 68 (55.9 per cent female) Yazidi refugees in Iraqi Kurdistan showed that women were significantly more likely to experience PTSD during the pandemic than were men (57.9 per cent vs. 43.3 per cent;  $\chi^2 = 9.2$ ,  $p < 0.01$ ).<sup>143</sup> Prior to the pandemic, female cohort members had on average reported experiencing 9.04 of the 17 DSM-IV PTSD symptoms (as compared with 4.76 among men;  $p < 0.01$ ); following the onset of the pandemic, women were describing experiencing an average of 12.01 of 17 symptoms (as compared with 6.46/17 among men;  $p < 0.01$ ).<sup>144</sup> Interestingly, female participants also had higher rates of pandemic-related depression, anxiety, and somatoform disorder as compared with men, though authors did not report statistical significance.

Similar trends have been observed among sub-populations in Saudi Arabia. For instance, a cross-sectional survey examining the mental health impact of the pandemic on 1,156 patients (47.5 per cent female) with inflammatory bowel disease found that men were less likely than women to have COVID-19 related anxiety (OR 0.66; 95 per cent CI 0.50-0.87;  $p = 0.003$ ).<sup>145</sup> In another cross-sectional study of 215 adults (40 per cent female) living in Saudi Arabia, women were more than four times as likely as men to have depression (OR 4.370; 95 per cent CI 2.4205-7.8905;  $p < 0.001$ ) and nearly three times as likely to have anxiety (OR 2.8549; 95 per cent CI 1.4362-5.6752;  $p = 0.002$ ).<sup>146</sup> Interestingly, a study of 168 (57.1 per cent female) patients seeking telehealth services from a cardiology practice in Saudi Arabia found that most symptomatic patients, including those with chest pain (62.7 per cent) and palpitations (55.2 per cent) were women, which investigators hypothesize may be related to greater stress during the lockdown.<sup>147</sup>

Sleep disturbances may be associated with mood and anxiety disorders among women in multiple Arab countries. For instance, a cross-sectional survey of 1,629 adults (57.6 per cent) residing across four governorates in Egypt examining the impact of the pandemic on sleeping patterns and depressive and anxiety symptoms found that women had a greater likelihood than men of exhibiting more severe symptoms of both depression (OR 2.13; 95 per cent CI 1.57-2.91) and anxiety (OR 2.64; 95 per cent CI 1.85-3.29).<sup>148</sup> In the UAE, one study of 1,012 adults (75.9 per cent female) similarly showed that women were more likely than men to describe sleep disturbances ( $p = 0.011$ ) and decreased sleep quantity ( $p = 0.05$ ) despite also reporting decreased screen time ( $p = 0.002$ ).<sup>149</sup>

Female university students have been shown in several studies to disproportionately experience depression and anxiety in the context of the pandemic. In Jordan, a cross-sectional study of 4,126 persons (59 per cent female) that included members of the general public, health care providers, and university students found that within nearly each sub-population, women had a statistically significant greater risk than men of depression (HCPs OR 1.48; 95 per cent CI 1.11-1.97;  $p < 0.01$ ) (university students OR 1.27; 95 per cent CI 1.00-1.61;  $p < 0.05$ ) and anxiety (general public OR 1.71; 95 per cent CI 1.18-2.48;  $p < 0.01$ ) (HCPs OR 1.63; 95 per cent CI 1.11-2.39;  $p < 0.05$ ) (university students OR 1.82; 95 per cent CI 1.36-2.44;  $p < 0.001$ ).<sup>150</sup> Interestingly, another cross-sectional study of both university students as well as faculty members in Jordan ( $N = 1,723$ ; 46.8 per cent female) found that men were nearly twice as likely to have good mental well-being scores (B 3.898; 95 per cent CI 2.387-5.409;  $p < 0.0001$ ), but also had higher rates of obesity (20.9 per cent of men vs. 13.5 per cent of women), smoking (37.4 per cent vs. 16.3 per cent), and chronic diseases including hypertension and diabetes (34.8 per cent vs. 18.9 per cent) ( $p < 0.0001$ ).<sup>151</sup>

In Saudi Arabia, a cross-sectional study of 400 (75.2 per cent female) university students found that women were approximately twice as likely as their male counterparts to meet criteria for anxiety (OR 1.963; 95 per cent CI 1.160-3.322;  $p = 0.012$ ).<sup>152</sup> Perhaps unsurprisingly, female students were found to be significantly more likely to seek social support to cope with stressors as compared with male students ( $p = 0.003$ ).<sup>153</sup> Another study of 154 university students (73.4 per cent female) conducted in the UAE similarly showed that, compared with men, women more commonly reported severe depression and anxiety (12 per cent vs. 5 per cent) as well as high or severe loss of confidence (35 per cent vs. 14 per cent) and social dysfunction (42 per cent vs. 34 per cent) though significance calculations were not provided.<sup>154</sup> A cross-sectional study done across 20 universities in Egypt on a snowball sample of 1,335 (61.8 per cent female) university students found that women were nearly twice as likely as men to report symptoms of depression (OR 1.67; 95 per cent CI 1.28-2.21;  $p < 0.001$ ), anxiety (OR 1.71; 95 per cent CI 1.33-2.19;  $p < 0.001$ ) and stress (OR 1.81; 95 per cent CI 1.39-2.33;  $p < 0.001$ ).<sup>155</sup> Rather than considering the myriad stressors to which young women may be uniquely subjected in Egypt, study authors instead suggested that these findings may be related to women being “more likely to over-complain about physical and psychological complaints” than their male counterparts, demonstrating clear bias and a poor understanding of gendered mental health determinants.<sup>156</sup>

A small number of studies in Jordan and Saudi Arabia failed to identify gender-based differences in mood or anxiety disorders. For instance, a cross-sectional study of 1,240 (47 per cent female) Jordanian social media users found no gender-based differences in rates of anxiety, depression, or sleep disturbances, despite an overall high prevalence of mental illness

(approximately 50 per cent in this cohort).<sup>157</sup> A cross-sectional study of 1,272 (85 per cent female) individuals in Saudi Arabia determined that an overwhelming 3/4 of this population had some degree of “psychological impact” in response to the pandemic, but that this trend was not gendered.<sup>158</sup> Interestingly, a small cross-sectional study conducted on a convenience sample of 248 (42.3 per cent female) older adults in Jordan found that older women had lower death anxiety scores (58.8 per cent vs. 76.1 per cent;  $p<0.001$ ) and higher religious coping scores (37.0 per cent vs. 33.8 per cent;  $p<0.001$ ) than did men, which authors thought may be related to higher rates of COVID-19 mortality among men.<sup>159</sup>

A limitation of several of these studies is that they do not collect COVID-19-specific data but draw conclusions about the impact of the pandemic simply from conducting data analysis following the February 2020 onset of the pandemic. While some studies do collect COVID-specific mental health data, others rely on historical controls or ask participants questions about their mental health prior to the pandemic, in order to make assumptions about the impact of the pandemic on mental health. The latter is subject to recall bias and both may fail to capture the gendered determinants of mental illness occurring due to the pandemic.

For instance, a cross-sectional study of 288 women accessing maternity services in Qatar determined that over one third of participants had anxiety, with 46.6 per cent meeting criteria for moderate-to-severe anxiety, while 39.2 per cent were diagnosed with depression.<sup>160</sup> Though the study objectives were to study the impact of the pandemic on women’s perinatal mental health, the authors did not use any COVID-specific scales or ask questions related to the pandemic. They also did not compare with historical controls. Women were asked about their concerns, and while most respondents indicated worries about their family and children, these were not necessarily specific to the pandemic.

Nonetheless, a significant number of primarily cross-sectional studies have sufficiently demonstrated a growing burden of mental illness disproportionately impacting women in this context. Future prospective studies are warranted to longitudinally measure the impact of the pandemic over time and develop interventions.

## Correlates of Stress and Mental Illness

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We have identified a number of correlates of mental illness during the COVID-19 pandemic among women in the Arab states. Notably, several study investigators attribute the observed gendered increase in distress and mental illness to “hormonal” differences between sexes that may predispose or augment women’s perception of stress.<sup>161</sup> While genetic and biological pathways including reproductive hormone cyclicity may be implicated in the pathophysiology of certain forms of depression and other mental illness in women,<sup>162</sup> such an argument in this setting is overly simplistic and overlooks the myriad gendered vulnerabilities to distress conferred by social determinants like food and income insecurity and primary caregiving responsibilities. Recognition of these gendered and intersectional risk factors for mental illness is essential and the first step to adopting an effective and integrative approach to this public health crisis.

## Exposure to COVID-19

A cross-sectional study of 603 Tunisian adults (74 per cent female) which aimed to investigate the relationship between COVID-19-related media exposure and post-traumatic stress disorder (PTSD) found in univariate analysis that female sex was a major predictor of PTSD (OR 25.95;  $p<0.001$ ), as were prior psychiatric illness (OR 7.48;  $p=0.008$ ), personal exposure to COVID-19 (OR 16.48;  $p<0.001$ ), time dedicated to pandemic media coverage (OR 17.02;  $p<0.001$ ), and barriers to obtaining protective equipment or communicating with others (OR 10.09;  $p<0.001$ ).<sup>163</sup> The prevalence of post-traumatic stress symptoms in this snowball sample was fairly high at 33 per cent. Gender remained significantly associated with PTSD in multivariate analysis (OR 0.34;  $p<0.001$ ).<sup>164</sup>

Similarly, a cross-sectional study done on a non-representative sample of 1,374 adults (51.0 per cent female) in Saudi Arabia, which determined an overall PTSD prevalence of 19.6 per cent among participants, identified female gender ( $p<0.05$ ), prior COVID-19 infection, and experiencing the death of a relative from COVID-19 as predictors of PTSD.<sup>165</sup> In contrast to these studies, a cross-sectional study of a geographically diverse sample of 908 Lebanese adults (69.3 per cent female) under quarantine during Spring 2020 did not find gender to be a significant predictor of post-traumatic stress symptomatology, though the study did not specifically examine COVID-19 exposure.<sup>166</sup>

## *Socio-economic Stressors: Unpaid Domestic Work and Food & Health care Insecurity*

Several studies have suggested that the increase in unpaid domestic work may be major stressors among women in the Arab states. For instance, a cross-sectional survey of 650 social media users in Palestine found nearly 50 per cent of women reported feeling anxious compared to only 30.8 per cent of men. Study authors postulated that these results could be attributed to the disproportionate burden of unpaid domestic work reportedly confronted by female study participants, as 68 per cent of women compared with only 44 per cent of men indicated a significant increase in household duties following the pandemic, while 51.5 per cent of women versus 30 per cent of men reported a marked increase in child care responsibilities.<sup>167</sup>

Another cross-sectional study done on a non-representative sample of 2,819 adults (72.6 per cent female) living in Palestine found that men were significantly less likely to have both mild/moderate depression (OR 0.69; 95 per cent CI 0.57-0.85) and severe/extremely severe depression (OR 0.52; 95 per cent CI 0.40-.86) than were women, and that predictors of depression in this population included low income and single marital status.<sup>168</sup> Authors hypothesized that increased domestic work among women could be driving their higher risk of mental illness.<sup>169</sup> These findings were supported by a small qualitative study of Palestinian women living in the West Bank (N=11), in which the women described feeling distress related to increases in unpaid domestic work as well as school closures and relatedly being unable to find childcare while having to continue to work.<sup>170</sup> These stresses were exacerbated in this particular setting by social isolation, as several women described their husbands working in Israel and being unable to return due to strict lockdown measures and quarantine procedures.<sup>171</sup>

Interestingly, a cross-sectional study of a non-representative, snowball sample of Jordanian mothers (N=2,103) that sought to specifically explore the mental health impact of the pandemic in this cohort found that depression, anxiety, and stress were all significantly correlated with a monthly income under 700 USD ( $p<0.001$ ), while depression was specifically associated with unemployment ( $p<0.001$ ), and lower education levels ( $p<0.01$ ).<sup>172</sup> Along these lines, a cross-sectional survey of 510 Egyptian social media users (69.5 per cent female) found that women were more likely to identify feelings of “horror” (58.3 per cent vs. 45.4 per cent;  $p=0.005$ ), apprehension (72.3 per cent vs. 54.6 per cent;  $p<0.001$ ), and helplessness (57.4 per cent vs. 41.4 per cent;  $p<0.001$ ), and were more likely to report caregiving responsibilities (68.5 per cent vs. 57.4 per cent;  $p=0.01$ ) than their male counterparts.<sup>173</sup> A qualitative study of 100 adolescents (50 per cent female) that included Lebanese, Palestinian, and Syrian refugees living in geographically diverse areas of Lebanon found that health care inaccessibility, particularly in the setting of refugee camp overcrowding and prohibitively expensive preventative measures, was a major source of distress in this population.<sup>174</sup> Female adolescent refugees especially perceived significant stress related to food insecurity as a result of the pandemic, in some instances expressing suicidality.<sup>175</sup>

## *Sexual and Gender-Based Violence*

An apparent rise in SGBV in Iraq since the onset of the pandemic has had a significant effect on negative mental health outcomes, with unpublished data indicating 123 SGBV-related suicide attempts among women and girls recorded during the lockdown as of June 2020.<sup>176</sup> As elsewhere in the region, the capacity for mental health care is extremely limited in Iraq, which has only three inpatient facilities and 34 clinics offering psychiatric services, equating to roughly 0.4 psychiatrists, 0.1 psychologists, and 0.2 social workers per 100,000 of the population.<sup>177</sup> Indeed, this scarcity of mental health resources is reflected throughout the region, which on average has only 7.7 mental health workers per 100,000 people, compared to a global average of 9, and 5.1 beds per 100,000 mental health patients compared to a global average of 16.4.<sup>178</sup> In Lebanon, physical violence at home was significantly associated with anxiety (B 23.969; 95 per cent CI 10.070-29.868;  $p<0.001$ ).<sup>179</sup>

## *Overlapping Crises: The Case of Lebanon*

There are overlapping and concurrent public health, economic, and political crises in Lebanon that may have a significant impact on women’s mental health. A cross-sectional study conducted on a snowball sample of 502 Lebanese adults (52.7 per cent female) found that women had higher mean scores than men on the Beirut Distress Scale (18.49 vs. 13.42;  $p<0.001$ ) and Lebanese Anxiety Scale (16.10 vs. 14.40;  $p=0.032$ ).<sup>180</sup> Additional predictors of anxiety identified in this study were fear of COVID-19 ( $p<0.001$ ), fear of being unable to access treatment for chronic illness ( $p<0.001$ ), fear of poverty ( $p=0.002$ ), previously higher socio-economic class ( $p=0.023$ ), number of dependent children ( $p=0.001$ ), family member with chronic disease ( $p=0.001$ ), and worry for a relative ( $p=0.002$ ).<sup>181</sup>

Since the onset of the pandemic, NGOs and civil society organizations operating in Lebanon had reported an increased need of psychosocial services among female constituents in particular.<sup>182</sup> Despite this increased need, many providers have had to reduce their mental health service capacity and/or adopt different modalities to accommodate for strict lockdown measures. This unmet need for mental health support was acutely exacerbated by the explosion of the Beirut port on 4 August 2020, which further exposed the multiple shortcomings in mental health care availability. A rapid assessment of the 82 primary health care facilities, social development centres, and dispensaries affected by the explosion found that, at baseline, there are severe deficiencies in mental health service availability, as nearly half of the facilities did not offer any psychologic or psychiatric service.<sup>183</sup> Psychosocial support services were available in 56 per cent of facilities, and mental health providers were available in some capacity at 47 per cent of facilities. Notably, only 22 per cent of facilities had psychiatric medications such as anti-depressants and anti-psychotics.<sup>184</sup> These shortages were likely further compounded by the country's economic collapse, with the lack of centralized subsidization to support medication importation as of January 2021 implicated in the reported unavailability of essential psychiatric medications such as sertraline, clonazepam, venlafaxine, and desvenlafaxine.<sup>185</sup>

## Section 5

### Gendered Impact of the Pandemic on General & Sexual and Reproductive Health

#### General Health

##### *Food Insecurity and Obesity*

Both social isolation and food insecurity as a consequence of pandemic-related income loss may exacerbate the pre-existing and gendered epidemic of obesity in the Arab region. A cross-sectional study of 200 women in Jordan found an average weight gain of approximately 2 kg during the pandemic as compared with the six months prior to the pandemic ( $p < 0.001$ ).<sup>186</sup> In the State of Palestine, a cross-sectional study of 650 Palestinians, which included 338 women (52 per cent), exploring the myriad gendered effects of the pandemic found that 57 per cent of women compared with 51 per cent of men reported gaining significant weight since the onset of the pandemic.<sup>187</sup> The mechanisms of obesity in this context are likely multifaceted and may be related to both limited access to healthy goods and extended periods of time spent indoors.

There also may be an association of weight gain with poor mental health in the context of social isolation. This was demonstrated by a cross-sectional study done in the Sulaimani governorate of Iraqi Kurdistan that sought to examine whether quarantine-related social isolation was associated with emotional eating and weight gain in a sample of 765 patients (39.5 per cent female) at a bariatric clinic. Investigators found that men were more likely to maintain their pre-pandemic weight and BMI and that among those who gained weight, women had a greater likelihood than men of gaining over 5 kg ( $p < 0.001$ ).<sup>188</sup> Another study which sought to determine the prevalence and predictors of emotional eating among 638 adult Saudi women found that 40.4 per cent reported moderate emotional eating, while 12.4 per cent described severe symptoms.<sup>189</sup> Stress was identified as a major predictor of emotional eating in this sample ( $p = 0.004$ ), and was additionally correlated with less and worse quality sleep, as well as less physical activity.<sup>190</sup>

A multi-national cross-sectional study of a convenience sample of 459 (51.6 per cent female) adults in Algeria, Libya, Saudi Arabia, and Tunisia similarly found that women were more likely than men to report low physical activity during the pandemic, and that such sedentary habits, along with fear of COVID-19 infection, were independent and significant determinants of distress among women ( $p < 0.001$ ).<sup>191</sup> Weight gain during the pandemic may then lead to more distress, thus perpetuating cycles of stress-induced emotional eating among women in particular. For instance, a cross-sectional study of a non-representative sample of 407 adults in Lebanon found that female gender was associated with higher levels of stress related to eating ( $p < 0.001$ ), as well as concerns about shape and weight ( $p < 0.001$ ).<sup>192</sup>

In contrast, preliminary findings from a longitudinal cohort study of 4,100 Jordanian, Syrian, and Palestinian adolescents living in refugee camps, informal tented settlements, and community settings in Jordan found that, since the onset of the pandemic, 15 per cent of participants noted an increase in food insecurity and 46 per cent reported being less likely to access protein as compared with pre-pandemic times.<sup>193</sup> In that study, older, married, non-Jordanian, female adolescents living in informal tented settlements were the least likely to report protein consumption, reflecting this population's intersectional vulnerability and risk of malnutrition. Another study of 3,129 Jordanian adults (74 per cent female) exploring the impact of the pandemic on food security found that 23.1 per cent and 36.1 per cent of participants reported severe and moderate food insecurity, respectively.<sup>194</sup> Predictors of food insecurity included family size, younger age, and low monthly income, though no differences in gender were observed.<sup>195</sup>

A starkly different trend in eating habits was observed in a high-income setting in the region; a cross-sectional study of 2,706 adults (54 per cent female) living in Riyadh found that 85.6 per cent of study participants reported eating daily home-cooked meals following the onset of the pandemic as compared with 35.6 per cent prior ( $p < 0.001$ ), and that the self-reported quality and quantity of the food was higher during the pandemic, though no gender-based differences were observed.<sup>196</sup>

### Health Care Accessibility

Multiple studies across diverse subpopulations of individuals with chronic diseases indicate that the COVID-19 pandemic, with some exceptions, has restricted women's general health care accessibility.

In a longitudinal study of Jordanian, Palestinian, and Syrian adolescents and their female caregivers residing in Jordan, 62 per cent of households surveyed described being unable to access health care when needed as a consequence of the pandemic.<sup>197</sup> A cross-sectional survey of 2,163 individuals (72 percent women) with chronic rheumatologic diseases across 15 Arab countries determined that 28 per cent of respondents had difficulty regularly accessing chronic rheumatic health care medications during the pandemic.<sup>198</sup> In multivariate analysis, inconsistent medication availability (OR 3.90; 95 per cent CI 2.08-7.30;  $p < 0.001$ ) was associated with a reported negative impact of the COVID-19 pandemic on individuals' visit to the rheumatologist. Further, women were more likely to report a negative impact of the pandemic on their rheumatology encounter (OR 1.53; 95 per cent CI 1.12-2.09;  $p = 0.008$ ).<sup>199</sup>

In contrast, several studies have been unable to identify a gender disposition in health care inaccessibility during the pandemic. For instance, a cross-sectional survey of 394 diabetic patients (42.9 per cent female) living in Jeddah, Saudi Arabia that sought to determine the impact of the pandemic on chronic medication adherence, found that adherence to glycaemic medications was higher prior to the pandemic than during (mean score 18.49 vs. 17.40;  $p < 0.001$ ). Investigators observed no statistically significant differences in adherence among men and women.<sup>199</sup> In Lebanon, a retrospective chart review of a single medical centre found a significant decline in overall Emergency Department visits following the closure of schools (19.96 per cent decrease per day;  $p = 0.04$ ) and borders (97.11 per cent per day;  $p < 0.0001$ ), but no significant changes on the basis of gender.<sup>200</sup> Along these lines, a retrospective study of 494 patients (52.3 per cent female) with neurological complaints presenting to a single Emergency Department in Saudi Arabia both prior to and following the onset of the pandemic found that, while there was a 24 per cent overall reduction in the number of visits during the Spring 2020 lockdown, no significant differences could be observed among men and women.<sup>201</sup>

### Case Study on Cancer: Gaza

In Gaza, a resource-constrained and conflict-affected setting, home to over one million Palestinian refugees, the addition of the pandemic on already-limited health care capacity is feared to have catastrophic effects, particularly on individuals with cancer requiring chronic therapy.<sup>202</sup> New COVID-19-related mobility restrictions and diversion of resources have disrupted health care accessibility for many Palestinians who normally have to travel outside of Gaza to receive medical treatment. This is especially notable for women with child-rearing responsibilities. For instance, a 30-year-old woman who had previously been receiving breast cancer treatment in East Jerusalem was no longer able to undergo therapy as doing so would have required a mandatory three-week quarantine in an isolation facility upon her return to Gaza, effectively keeping her away from her children.<sup>203</sup> Other women are fearful of contracting COVID-19 while receiving care in Gaza, as the two oncological facilities in the area are overcrowded with up to six inpatients per room and one toilet for 150 outpatients and their families to use each day.<sup>204</sup> These conditions are feared to worsen as WHO and Ministry of Health officials are in the process of converting a major hospital – which provides treatment for approximately 30 per cent of cancer patients in Gaza – into a COVID-19-only facility.<sup>205</sup>

## Case Study on Cancer: Morocco

Breast and cervical cancer are major public health challenges in Morocco, where they represent the most common forms of cancer among Moroccan women. Breast and cervical cancer accounted for 19.2 per cent and 12.3 per cent respectively of the 52,783 new cancer diagnoses made among Moroccan women in 2018.<sup>206</sup> Notably, the majority of Moroccan women have advanced disease at the time of diagnosis, often stages III or IV, indicating baseline barriers to accessing health services.<sup>207</sup> The COVID-19 pandemic has lengthened this already prolonged delay in care-seeking, as routine screenings have been postponed in the country.

A recent commentary describes new clinical recommendations to limit patient exposure to health care facilities in Morocco. These include delaying breast cancer screening, postponing surgery and radiotherapy for lower grade breast cancers, using second-line chemotherapeutic regimens of unclear benefit, and conducting clinical staging only for higher risk disease,<sup>208</sup> all of which violate the standard of care and may have dire health ramifications on a population level. Despite these delays in screening, there were 212 new cancer diagnoses made at a single oncology centre in Morocco from 2 March to 20 April 2020, 58 per cent of which applied to women. Notably, 26 per cent were diagnosed with breast cancer, which is higher than the country's previously reported averages and raises additional concerns about still undiagnosed breast cancer in those women unable to access screening for extended periods of time.<sup>209</sup> Similar recommendations have been made by Moroccan investigators for cervical and endometrial cancers, which even prior to the pandemic were characterized by delayed diagnoses at advanced, non-operable stages.<sup>210</sup>

Another recently published article describes similar disruptions to the clinical care of breast and cervical cancer at a regional oncology centre in Morocco.<sup>211</sup> Presumably to limit patient contact with health care facilities during the pandemic, the authors recommend delaying standard-of-care therapies for both diseases, and instead treating with sub-optimal, albeit lower risk, treatment regimens. For instance, a lower dose of radiation therapy typically reserved for elderly, frail patients, is now being recommended for young women with potentially aggressive breast cancer,<sup>212</sup> a practice which may have dire implications on their clinical care and prognosis.

More recently, recommendations on breast, cervical and ovarian cancer management in Morocco during the post-pandemic era were published.<sup>213</sup> These are more relaxed than those guidelines put forth during the initial quarantine, though remain conservative as compared with pre-pandemic recommendations. For example, the author recommends postponing treatment for low-grade or early-stage cancers but advocates immediate action for high-risk malignancies or malignancies with curative therapies, including certain types of breast cancer.<sup>214</sup>

## Sexual and Reproductive Health

### Introduction

In April 2020, UNFPA projected that 47 million women living in 114 low- and middle-income countries would be unable to access modern contraceptives as a consequence of the pandemic, resulting in an estimated 7 million unintended pregnancies.<sup>215</sup> Barriers to receiving sexual and reproductive health care are thought to be related to the diversion of health-care resources toward COVID-19-related care, supply chain disruptions, widespread PPE shortages and reduced health care workforce capacity.<sup>216</sup>

In a recent survey of 51 clinical SRH service providers, academics, and policy-makers across 29 countries, including several Arab states,<sup>ii</sup> 86 per cent reported decreased contraceptive accessibility as a consequence of the pandemic with perceived barriers including changes in health-care-seeking behaviours among women due to fear of infection, lockdown restrictions, and clinic closures.<sup>217</sup> Particularly in contexts where women's health was not already prioritized, respondents felt that the pandemic served to further dismantle women's sexual and reproductive health rights.

Over 15.5 million women of reproductive age living in the Arab region, including an approximate 1.5 million pregnant women, required some form of humanitarian aid prior to the pandemic.<sup>218</sup> **Table 7** outlines key baseline SDG indicators of women's sexual and reproductive health, including SDG indicators, comparing Arab countries with global averages. While most of the Arab states have low maternal mortality ratios, other indicators such as adolescent birth rate, contraceptive prevalence, and met need for family planning are quite poor. In addition to gaps in this data, it is worth noting, too, that these indicators may not sufficiently reflect population health needs in this region, given the previously mentioned challenges of outdated, missing or inaccurate data.



Thus, while the health needs of women in the Arab states may be underestimated by the SDG indicators, it is likely that the poor sexual and reproductive health outcomes, especially evident in low-income countries of the region, are exacerbated by the pandemic. Yet the effects of diverting resources from women's health are already being observed in Arab countries. For instance, Médecins Sans Frontières staff observed a surge in the number of pregnant women seeking labour and delivery care in Mosul, Iraq, after a major public hospital was repurposed into a COVID-19-only facility.<sup>219</sup> There are reports of physicians in several Arab countries being redeployed to provide COVID-specific care rather than sexual and reproductive health services.<sup>220</sup> Pandemic-associated border closures have led to disruptions in supply chains of contraceptives and antiretrovirals.<sup>221</sup>

## Obstetric Care

Studies from multiple Arab states suggest that pregnant women are experiencing significant barriers to accessing prenatal and delivery care as a consequence of the COVID-19 pandemic. In Morocco, a cross-sectional survey of 2,350 representative households which sought to determine the impact of the pandemic on various aspects of health and well-being found that approximately a third of pregnant women were unable to access prenatal care while another third were unable to access sexual and reproductive health services generally.<sup>222</sup> Primary reasons cited included fear of contracting COVID-19 in a health care setting, inability to travel to a health care facility, and closure of facilities or services.

A cross-sectional study conducted on a representative sample of 944 pregnant Jordanian women found that a remarkable 59.5 per cent of respondents reported being unable to receive any antenatal care during the Spring 2020 lockdown, as compared with just 4 per cent of women prior to the lockdown ( $p < 0.001$ ), while nearly 50 per cent of the cohort described experiencing difficulty accessing or being altogether unable to obtain medications during quarantine.<sup>223</sup> Notably, a number of participants had pre-existing medical conditions that, under normal circumstances, warrant close monitoring during pregnancy including hypothyroidism (5.19 per cent), respiratory disease (4.13 per cent), hypertension (3.5 per cent), and diabetes mellitus (2.44 per cent).

Similarly, a mixed-methods study of mostly female Lebanese and Syrian refugee NGO service beneficiaries in Lebanon found that 35 per cent of pregnant women reported inability to access antenatal care as a result of the pandemic.<sup>224</sup> These barriers to obstetric care were further exacerbated by the explosion of the Beirut port, which displaced approximately 4,000 pregnant women, of whom roughly 440 were due to deliver within a month of the event.<sup>225</sup> An assessment of the six field hospitals established by Egypt, Iran, Jordan, Morocco, Qatar, and Russia in the aftermath of the explosion found that most lacked maternity services, essential obstetric medications and skilled birth attendants. Basic emergency obstetric and neonatal care were available only in two hospitals, only one of which could perform all critical interventions for complicated deliveries.<sup>226</sup> A separate assessment of 82 health care facilities that sustained damage following the explosion found that labour and delivery care for normal pregnancies was available in under 10 per cent, basic emergency essential obstetric care was available in approximately 13 per cent, and antenatal and postpartum care was offered in roughly half of all facilities.<sup>227</sup>

Anecdotal reports from elsewhere in the region suggest similar challenges. For instance, in Palestine, there are concerns about pregnant women being unable to access appropriate reproductive health care, with massive reductions in medical referrals to facilities in Jerusalem and Israel, where women with complicated pregnancies may, under normal circumstances, have delivered.<sup>228</sup> In Somalia, a decline in routine and essential health services is thought to disproportionately impact pregnant and nursing women as well as children seeking immunizations. Some fear that these disruptions in care may threaten advances made in maternal and under-five mortality over the past two decades.<sup>229</sup>

Adolescent girls may be particularly vulnerable to these barriers in accessing maternal care, especially in settings with a baseline high prevalence of early marriage. In Jordan, for instance, UNFPA and Plan International conducted a mixed-methods, rapid gender assessment of 397 adolescent and adult Jordanian and Syrian refugee service beneficiaries that included 360 remote surveys, 28 key informant interviews with policy makers, educators, and GBV and SRH service providers, and two focus group discussions with women and girls.<sup>230</sup> Despite adopting a purposive sampling strategy of existing service users, the study found a staggering 50 per cent of girls and women surveyed reported being unable to access any maternity services during lockdown.

Obstetric service providers in the region may not have the capacity to meet the needs of pregnant women with COVID-19. This may be particularly notable in resource-limited, conflict-affected settings such as Libya, where a cross-sectional survey of 174 primarily female (96.6 per cent;  $N=168$ ) obstetricians that aimed to assess physicians' pandemic preparedness found that 75 per cent of those surveyed felt that the pandemic had detrimental effects on their practice.<sup>231</sup> Though 81 per cent reported ability to care for emergent obstetric cases, only 57 per cent reported dedicated isolation areas for patients with COVID-19, and just 30 per cent had designated COVID-19 obstetric teams in the inpatient setting. In terms of COVID-19 clinical care, 59 per cent of obstetricians reported that they had no guidance on managing COVID-19 in pregnancy and 43 per cent described receiving no training on COVID-19 generally. Only 29 per cent of the sample felt their institution had an obstetric team "qualified" to care for COVID-19 patients.

**Table 7. Baseline indicators of women's sexual and reproductive health for most recent year available**

COUNTRY	Antenatal Care Coverage (>4 visits) (%)	Contraceptive Prevalence (any) (% women ages 15-49)	Contraceptive Prevalence (modern) (% women ages 15-49)	Maternal mortality ratio (per 100,000 live births) (SDG 3.1.1)	Met Need for Family Planning with Modern Contraception (% women ages 15-49) (SDG 3.7.1)	Adolescent birth rate per 1,000 adolescent girls (SDG 3.7.2)	Coverage of essential health services (SDG 3.8.1)
ALGERIA	67.30	57.1	49.5	112	77.2	9.7	78
BAHRAIN	100.0	--	--	14	66.4	14.3	77
DJIBOUTI	25.70	19.0	18.0	--	50.9	21	--
EGYPT	82.80	--	--	37	80.0	56	68
IRAQ	67.90	52.5	35.9	79	54.6	82.1	61
JORDAN	91.60	61.2	42.3	46	56.7	27	76
KUWAIT	88.50	52.0	39.3	12	72.9	6.1	76
LEBANON	80.90	58.0	40.4	29	61.9	16.7	73
LIBYA	--	--	--	72	24.0	10.9	64
MOROCCO	60.90	67.4	58.6	70	68.6	32.2	70
OMAN	--	29.7	18.8	19	39.6	13.5	69
PALESTINE	--	57.2	44.1	27	64.6	48	
QATAR	--	37.5	34.4	9	68.9	10.3	68
KSA	--	20.8	--	17	43.1	7.4	74
SOMALIA	6.30	7.9	7.8	--	3.9	123	--
SUDAN	50.70	12.2	11.7	295	30.1	86.8	44
SYRIA	63.70	46.6	37.5	31	53.3	54	60
TUNISIA	84.10	62.5	50.9	45	73.2	6.9	70
UAE	97.30	--	--	3	70.7	5.4	76
YEMEN	25.10	--	--	--	43.8	67.2	42
WORLD	59.2	59.8	53.8	211	75.7	43.9	66

Sources: UN-Women – Women Count. <https://data.unwomen.org/>; UNICEF (2022). COVID-19 and children data hub. <https://data.unicef.org/>; WHO (2022) The Global Health Observatory. <https://www.who.int/data/gho/data/countries/>; IHME (2022). Health-related SDGs. <https://vizhub.healthdata.org/sdg/>; The World Bank (2022). DataBank: Gender Statistics. <https://databank.worldbank.org/source/gender-statistics>.



## *Contraception, Family Planning and Non-Maternity Sexual and Reproductive Health*

Studies and reports suggest a growing unmet need for contraception in the Arab states as a result of the COVID-19 pandemic. In Tunisia, for instance, use of free SRH services, which had declined over the past several years with a roughly 30 per cent unmet need for contraception in 2019 and an approximately 50 per cent prevalence rate of contraception use, has acutely worsened during the pandemic, as 50 per cent of prior family planning users are unable to access contraception during the lockdown.<sup>232</sup> A survey of 126 midwives there confirmed that half of all SRH service providers have either reduced or stopped providing care altogether as a result of the lockdown.<sup>233</sup> Similarly, in Sudan, a major provider of contraception has closed as a consequence of the pandemic.<sup>234</sup>

Sexual and reproductive health care accessibility may be especially challenging in rural regions. For instance, in Iraq, health care providers surveyed in the rural regions of Diyala and Kirkuk noted a decrease in both SRH resources and service utilization, particularly with regard to antenatal care and contraceptive use. In Diyala, the number of women using SRH services, including and especially family planning services, decreased from 16 per cent prior to the pandemic to 6 per cent following the pandemic, generating concern over a potential rise in unintended pregnancies.<sup>235</sup>

In Jordan, a survey of Jordanian and Syrian refugee adult women found that a staggering 41 per cent of prior contraception users were longer able to access contraceptives.<sup>236</sup> This decline in sexual and reproductive health resource availability, in the setting of a perceived reduction in decision-making power due to a rise in domestic violence, has resulted in concerns about unintended pregnancy reported by 71 per cent of women of childbearing age.<sup>237</sup> Similarly, a longitudinal survey of 4,100 Syrian, Palestinian, and Jordanian adolescents in Jordan found that, since the onset of the pandemic, 25 per cent of unmarried female adolescents reported inability to access menstrual hygiene products, while 21 per cent of married female adolescents described difficulty receiving SRH services.<sup>238</sup>

A mixed-methods study of 397 adolescent and adult Jordanian and Syrian refugee service beneficiaries in Jordan found that women were encountering new barriers to accessing SRH services since the onset of the pandemic, with up to 20 per cent of women reporting that they are newly unable to access family planning services altogether. Additionally, 61 per cent of women ages 25 to 29 and 41 per cent of women ages 18 to 24 interviewed reported “always” being able to access family planning counselling prior to the pandemic, but only 15 per cent and 24 per cent respectively being able to maintain this access during the pandemic.<sup>239</sup> Medical service providers interviewed felt that the impact on access to contraceptives would be greatest for women relying on short-term or barrier methods like oral contraceptive pills and condoms, as these may either become newly prohibitively expensive or altogether unavailable.<sup>240</sup>

Similar findings were demonstrated by a cross-sectional study of 200 women living in Jordan which found that outpatient SRH care declined by a factor of four during the Spring 2020 lockdown ( $p < 0.001$ ), correlating with a decline in contraception use from 66.5 per cent of participants prior to the pandemic, to 59.5 per cent of participants during the lockdown ( $p = 0.017$ ).<sup>241</sup> Interestingly, the proportion of study participants using contraception for family planning specifically declined from 55 per cent prior to the pandemic, to 48.5 per cent during the pandemic ( $p = 0.007$ ), which has implications for unintended pregnancy, particularly in a setting where abortion care is criminalized under most circumstances. Intrauterine devices (IUDs) followed by male condoms were the most common form of contraception in this cohort, though interestingly 7 out of 8 study participants reported needing to replace their IUD during the Spring 2020 lockdown and being unable to do so.<sup>242</sup>

In Lebanon, a mixed-methods study of Lebanese and Syrian refugee service beneficiaries in Lebanon demonstrated that 42 per cent of women have been unable to access family planning or SRH care since the onset of the pandemic.<sup>243</sup> Of these, 83 per cent cited concerns about acquiring the virus as a primary obstacle to obtaining care. In response to these unmet needs, the Lebanon Family Planning Association for Development and Family Empowerment has made concerted efforts to remain open and provide sexual and reproductive health services for underserved communities in spite of the pandemic.<sup>244</sup> The organization describes implementing social distancing measures and providing COVID-19 information and hygiene kits to its patients, while continuing to address the health needs of women and girls.

Yet despite these efforts, barriers to contraception accessibility in Lebanon were significantly exacerbated by the explosion at the port of Beirut on 4 August 2020. Approximately 84,000 women of reproductive age were among the 300,000 people displaced following the blast.<sup>245</sup> Contraceptives including pills, injectables, implantable contraceptives, intrauterine devices, condoms, and long-acting reversible contraceptives were available at approximately 42 per cent of facilities, while emergency contraception was accessible only at 24 per cent of centres.<sup>246</sup>

Of note, transgender women in Lebanon represent a particularly vulnerable subpopulation at especially high risk of poor health outcomes as a result of the pandemic. Many of the organizations and services that previously supported this community have lost their funding, leaving many transgender women without health care, including access to hormonal and surgical therapy.<sup>247</sup> Such interruptions in medical care may carry far-reaching implications in this highly stigmatized and marginalized community, with potential effects on their livelihood, housing security, and exposure to violence.

## Menstrual Hygiene Resources

The negative impact of the pandemic on sanitary product accessibility has been observed among both host and displaced communities of women in Jordan, Lebanon, and Iraq, but also in Somalia, where similar barriers have been identified, particularly among adolescents.

In Jordan, a rapid assessment of 847 Jordanian and Syrian beneficiaries of UN Women services found that 30 per cent of women and girls described insufficient access to sanitary pads since the onset of the pandemic.<sup>248</sup> Interestingly, a cross-sectional study of a non-representative community sample of 200 women in Jordan found a decline in symptomatic reproductive tract infections as compared with prior to the pandemic (25.5 per cent vs. 19 per cent;  $p < 0.05$ ), which investigators attributed to improved hygienic practices during the pandemic.<sup>249</sup> Such findings highlight potential health care disparities between host and refugee communities.

Likewise in Lebanon, a cross-sectional survey of 1,100 Lebanese and Syrian refugee women found that 66 per cent of adolescents and 53 per cent of female caregivers reported inability to regularly access menstrual hygiene resources during the pandemic.<sup>250</sup> Another cross-sectional study of 562 women and adolescent survivors of violence in Lebanon demonstrated that approximately 70 per cent reported difficulty accessing health services during the pandemic, while 80 per cent described being unable to obtain sanitary pads.<sup>251</sup> The women surveyed cited cost (67 per cent), mobility restrictions due to the lockdown (35 per cent), lack of resources (22 per cent), harassment in the streets (16 per cent), and fear of arrest or deportation (9 per cent) as major barriers to care. These findings were further corroborated by a qualitative study of adolescent Lebanese and Syrian and Palestinian refugees living in Lebanon, which identified inaccessibility of menstrual hygiene products, particularly among married adolescent refugees, to be a major concern, with girls describing needing to “borrow” products from stores or re-use cloth at home.<sup>252</sup> These findings were in stark contrast to that of the primarily urban governorate of Sulamaniya, where all women surveyed described having access to menstrual hygiene resources, suggesting additional barriers to care in rural settings.<sup>253</sup>

Similarly in Somalia, a recent mixed-methods study of a nationally representative sample of 756 Somali adolescents and adults found that 50 per cent of women were unable to access SRH services, and 47 per cent perceived a decrease in menstrual hygiene resource availability as a result of the pandemic.<sup>254</sup> To overcome this deficiency, some respondents described exchanging sex for money in order to purchase sanitary pads, while others reported using reusable pads.

## Responding to Health Disparities

### Pregnancy, Labour & Delivery

The effects of SARS-CoV-2 in pregnancy remain poorly understood among physicians in the region as elsewhere.<sup>255</sup> For instance, one cross-sectional survey of 147 obstetricians and paediatricians in Jordan found that 22.4 per cent thought pregnant women could vertically transmit the virus and 42.9 per cent believed the virus could be transmitted through breastmilk.<sup>256</sup> Of note, while data remains inconclusive, there is some evidence globally to suggest that vertical transmission of SARS-CoV-2 may occur in a minority of cases during the third trimester,<sup>257</sup> while breastfeeding does not seem to be a risk of SARS-CoV-2 infection among neonates.<sup>258</sup> Additionally, nearly 75 per cent of Jordanian participants sampled correctly thought pregnant women with COVID-19 have more complications than others with COVID-19, while over 50 per cent and 80 per cent believed that SARS-CoV-2 testing and COVID-19 treatment respectively should be prioritized for pregnant women.<sup>259</sup>

Given these uncertainties and concerns, medical societies and institutions across several Arab countries have issued guidelines and protocols to account for COVID-19 in settings of pregnancy, labour and delivery. For instance, the Saudi Arabian Ministry of Health recommends delivery per obstetric assessment for pregnant women with COVID-19 in an isolated setting with contact and droplet precautions, followed by immediate removal of the neonate from the mother, though allowing for breastfeeding. Hospital discharge is recommended only after two negative SARS-CoV-2 PCR tests with close clinical follow-up through the first two weeks at home.<sup>260</sup> In Lebanon, the Ministry of Health assembled a committee on COVID-19 in pregnancy that aims to prevent

SARS-CoV-2 transmission among pregnant women and increase public awareness on the disease in this community, particularly among low-income women with limited access to antenatal care. The committee developed educational materials and clinical protocols for inpatient and outpatient management of COVID-19 in pregnancy which were disseminated to approximately 250 health care facilities throughout the country.<sup>261</sup> In Oman, clinicians have published best practices for obstetric care delivery during the pandemic, though these do not include recommendations related to breastfeeding or infant isolation.<sup>262</sup>

Maintaining antenatal care service delivery is challenging in a region with limited capacity for and experience with telehealth. In Oman, for instance, physicians conducting telephone consultations for antenatal and other routine health care services cited challenges related to confidentiality, limited resources and poor patient interactions, and suggested that video consultation may address some of these limitations.<sup>263</sup> To maintain remote care and address shortcomings in telehealth capacity, the King Abdullah Hospital in Jordan has established a hotline with which pregnant women may reach their physicians, as well as a midwife-led Facebook page providing patients a platform to openly communicate with their health care teams.<sup>264</sup>

**“ Maintaining antenatal care service delivery is challenging in a region with limited capacity for and experience with telehealth. ”**

King Abdullah Hospital also successfully repurposed its burn unit to develop an isolated labour and delivery facility for pregnant women with COVID-19. The facility is equipped with negative pressure isolation rooms, operating space, and ICU-level monitoring capacity. There are even dedicated areas for health care workers staffing this unit to intermittently quarantine for 14 days upon completion of their clinical obligations.<sup>265</sup>

The first reported case of a caesarean section on a COVID-19-positive patient in the Arab world was at another hospital in Jordan during the early spring. The new mother was separated from her infant until three serial SARS-CoV-2 PCR tests had resulted negative. During that time, the infant continued to receive breast milk and was cared for by a midwife.<sup>266</sup> Egyptian obstetricians similarly published recommendations regarding the postponement of breastfeeding and the separation of neonates from mothers with COVID-19, though it is unclear whether these policies have been widely adopted.<sup>267</sup>

While it is encouraging that some Arab governments and institutions have taken explicit action to address the unique risks to women’s health posed by COVID-19 in pregnancy, many of these protocols in fact violate women’s childbirth rights and the standards of care as put forth by the WHO. Separating mothers from their infants may confer serious and long-term health risks to both parties.<sup>268</sup> The WHO guidelines dictate that, irrespective of SARS-CoV-2 infection status, all women during labour and delivery should have access to respectful and skilled care, which includes access to skin-to-skin contact and rooming with their infant following birth.<sup>269</sup> The childbirth protocols implemented in Saudi Arabia, Jordan and other countries in the region are fear-based approaches not based in scientific evidence, and potentially pose greater harm by neglecting pregnant women’s human rights. Promisingly, more recent guidelines released by the Saudi Society of Maternal Fetal Medicine encourage an “individualized” approach to postpartum care, including the decision of whether to initiate breastfeeding or separate a neonate from a SARS-CoV-2-infected mother, on the basis of illness severity and health care worker exposure, recommending patient counselling on risks and best practices.<sup>270</sup>

### **Cancer Screening and Treatment**

Numerous hospitals in the region have developed clinical recommendations to address disruptions to routine breast and gynaecologic cancer screening and treatment. The Oncology Department at the Salah Azaiez Institute in Tunis, for example, assembled an oncologist-staffed “COVID-19 crisis unit” that would provide established breast cancer patients 24/7 remote access to their physicians.<sup>271</sup> While their chemotherapy infusion centre continued operating at full capacity to maintain breast cancer treatment, they implemented additional key changes to make breast cancer chemotherapy more accessible to patients.

These included switching from intravenous to oral regimens and allowing patients to acquire oral chemotherapeutics from their local pharmacies. Furthermore, various adjustments were systematically made to pre-existing chemotherapeutic regimens to minimize toxic gastrointestinal and hematologic side effects and thereby minimize the need for hospital admissions.

The Saudi Oncology Pharmacy Assembly put forth similar recommendations for breast cancer treatment, which included delaying adjuvant chemotherapy for early-stage breast cancer, spacing out chemotherapy doses to minimize health care and relying upon telemedicine to remotely address symptoms.<sup>272</sup>

The “breast unit” of a university hospital in Beirut, Lebanon continued to conduct screening mammography during the pandemic in order to prevent delaying diagnoses, while following other precautions such as wearing PPE, arranging paperwork ahead of time, restricting visitors, and providing immediate results.<sup>273</sup> Despite their continued activity, fewer patients presented to the screening clinic, as evidenced by a 73 per cent reduction in activity during the Spring 2020 lockdown as compared with the same time in the prior year. The centre ultimately conducted 153 mammograms, 205 ultrasounds and 16 breast MRIs during the Spring 2020 lockdown. Indications for mammograms included screening (41.5 per cent), follow-up (22 per cent), clinical symptoms (20 per cent), and breast cancer surveillance (16.5 per cent). Approximately 41 per cent of biopsies were positive for cancer. Among the 205 patients were 14 new cases of breast cancer; all but one were invasive carcinomas.<sup>274</sup> This advanced stage of breast cancer raises concerns about delaying screening mammograms, even in the setting of a pandemic, as this may have disastrous consequences on women’s health.

## Section 6

### Sexual- and Gender-Based Violence

#### Introduction

The COVID-19 crisis has precipitated what UN Women terms a “shadow pandemic” of violence against women and girls, particularly as half of the world’s population continues to be in cycles of lockdown. An estimated 243 million reproductive-age girls and women globally have experienced intimate partner violence in the preceding year.<sup>275</sup> While globally there remains a paucity of rigorously collected evidence to support this rise in violence against women, anecdotal data reported by women’s organizations, law enforcement, and health care facilities suggests that there has been an upwards trend since the onset of the pandemic.<sup>276</sup> Specifically, strict shelter-in-place measures confining women in spaces with their abusers and escalating financial insecurities are thought to precipitate or exacerbate domestic violence.<sup>277</sup> Gender-based cyberviolence has also been observed in a number of countries across cultural contexts. In fact, UNFPA predicts that for every three months of pandemic-related lockdown, 15 million women will suffer from gender-based violence worldwide.<sup>278</sup>

Despite this apparent rise in cases of violence against women, figures are still thought to be underestimated, as women survivors of violence historically are unable or unwilling to seek assistance, a trend thought to be made worse by the relative inaccessibility of services during lockdowns and with diversion of resources toward COVID-19 care.<sup>279</sup>

Women living in the Arab region are known to experience among the world’s highest rates of intimate partner violence.<sup>280</sup> In fact, over a third of ever-partnered women in Arab countries have reported experiencing intimate partner violence at some point prior to the pandemic, a figure that is thought to be an underrepresentation.<sup>281</sup> Of these, less than half sought support. In Lebanon, for instance, just 18 per cent of registered and 14 per cent of unregistered Syrian refugee women stated that they would formally report an incidence of GBV.<sup>282</sup>

To determine the impact of the COVID-19 pandemic on violence against women in this context, UN Women conducted a mixed-methods study, interviewing over 220 women’s organizations operating in 15 Arab countries.<sup>283</sup> Over 50 per cent of respondents reported a perceived increase in domestic violence and approximately 40 per cent noted a rise in online violence against women. The most common reasons cited for this apparent rise in violence included financial stressors, mobility restrictions in the setting of lockdown measures, and disruptions to support services. Nearly 40 per cent of respondents reported that legal proceedings concerning violence were halted as a consequence of the pandemic, potentially leading women to seek alternative, more

“traditional” interventions such as those from other family members or community leaders, which may paradoxically exacerbate their risk of violence. To accommodate these unprecedented circumstances, 86 per cent of the surveyed organizations described pursuing novel means by which to reach women survivors of violence, including through social media and mobile application platforms. However, such channels may fail to engage those most vulnerable women who may not be literate or have internet accessibility. Notably, the overwhelming majority of organizations surveyed noted a financial decline as a consequence of the pandemic, with approximately two-thirds anticipating a partial or complete abatement of operations over the next year without additional funding.<sup>284</sup> Such a decline in essential services would have disastrous consequences on women’s safety and wellbeing, as civil society organizations regionally are responsible for the bulk of women’s protection.

Sub-populations of women may be at increased risk of SGBV and poor sexual and reproductive health outcomes. Adolescents, for instance, represent globally a vulnerable population whose susceptibility is further exacerbated in the Arab context due to stigmatizing norms which restrict access to sexual and reproductive health rights and services for the unmarried.<sup>285</sup> The pandemic has disrupted schooling for 743 million girls worldwide, raising concerns about increase in early marriage.<sup>286</sup> In early spring 2020, approximately 46 million girls in the Arab region were impacted by school closures.<sup>287</sup> Prior to the pandemic, early marriage among Syrian refugee girls in particular was associated with school-drop out.<sup>288</sup> The impact of the pandemic on this population has not yet been determined, though many are concerned about the implications for girls in particular.

## Baseline Sexual and Gender-Based Violence Indicators

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Despite the markedly high prevalence of intimate partner violence, there are significant gaps in population-based data of other indicators of sexual- and gender-based violence (SGBV) in the Eastern Mediterranean Region of the WHO, which is characterized as being the only WHO region with total absence of data on non-partner sexual violence.<sup>289</sup> Along these lines, there is a paucity of country-specific, standardized, nationally representative data on exposure to physical and sexual violence or femicide within the Arab region.

In fact, as outlined in **Table 8**, nation-wide estimates on physical and sexual violence exposure are available only for two countries in the region, Egypt and Jordan, though in both cases, these figures are outdated. More recent studies suggest that approximately 26 per cent of Jordanian women have experienced intimate partner violence, with nearly 90 per cent of reported SGBV cases in Jordan in 2019 perpetrated by an intimate partner.<sup>290</sup> In Egypt, 36 per cent of reproductive-age married women are estimated to have experienced physical violence, perpetrated in 64 per cent of cases by a spouse, and 87 per cent have undergone genital mutilation.<sup>291</sup> Similarly, a staggering 98 per cent of reproductive-age girls and women in Somalia are estimated to have suffered from genital mutilation.<sup>291</sup> In Iraq, over 20 per cent of reproductive age-women reported experiencing physical domestic violence in 2008,<sup>293</sup> and there were 548 cases of femicide committed by an intimate partner in 2017 alone.<sup>294</sup> In Morocco, the most recent population-based survey on GBV was conducted in 2011; at that time, 6 million women ages 18-64, or roughly 63 per cent of the female population, was estimated to have experienced some form of violence, though only 3 per cent of cases were reported.<sup>295</sup> More recently, two cross-sectional surveys conducted in 2011 and 2019 of 7,913 households in the West Bank and 3,632 households in Gaza quantified the prevalence and types of intimate partner violence experience by ever-married women in the preceding 12 months.<sup>296</sup> **Figure 9** depicts these findings.

The limited availability of data is consistent with a larger trend of knowledge gaps in gender indicators in the region. **Figure 10** illustrates the percentage of gender-related SDG indicators (not limited to SDG 5 indicators) by country in the Arab region.

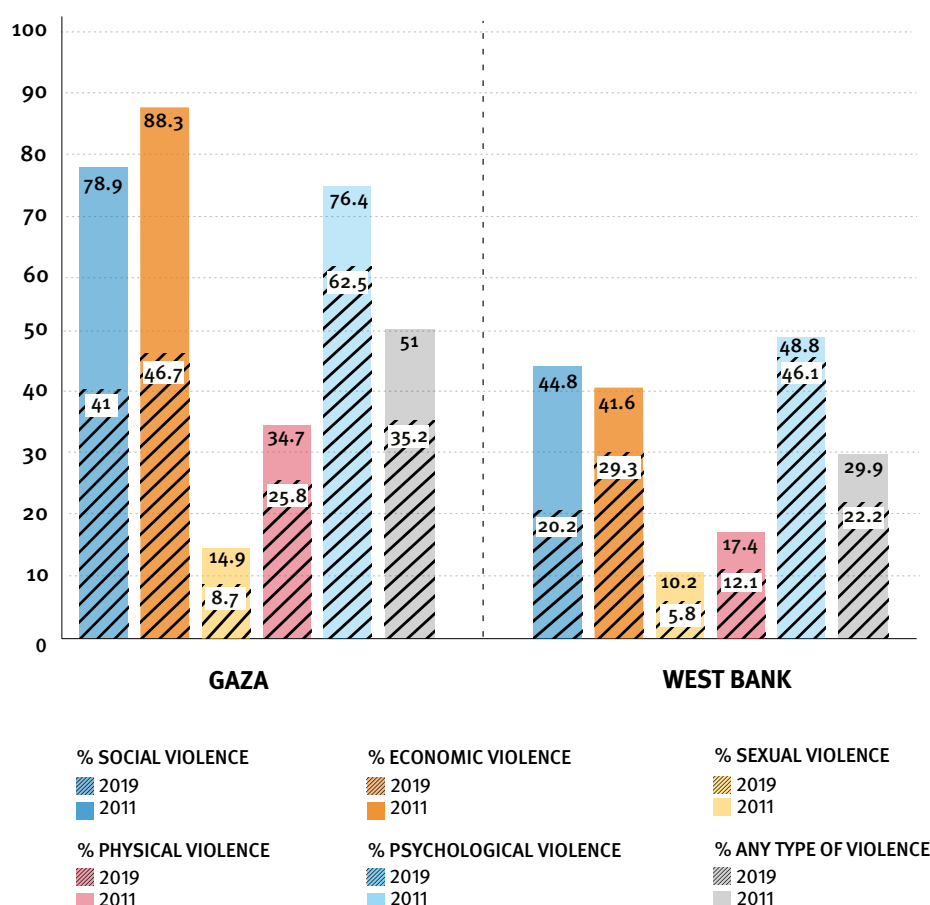
**Table 8. Baseline indicators of sexual and gender-based violence for most recent year available\***

COUNTRY	Exposure to physical and/or sexual violence in last 12 months (% women ages 15-49)	Ever exposure to physical and/or sexual violence (% women ages 15-49)	Exposure to intimate partner violence (% women ages 15-49)
EGYPT	14.0	4.5	25.6
JORDAN	14.1	5.2	18.9

\*Data for Algeria, Bahrain, Djibouti, Iraq, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, KSA, Somalia, Sudan, Syria, Tunisia, UAE and Yemen are not available.

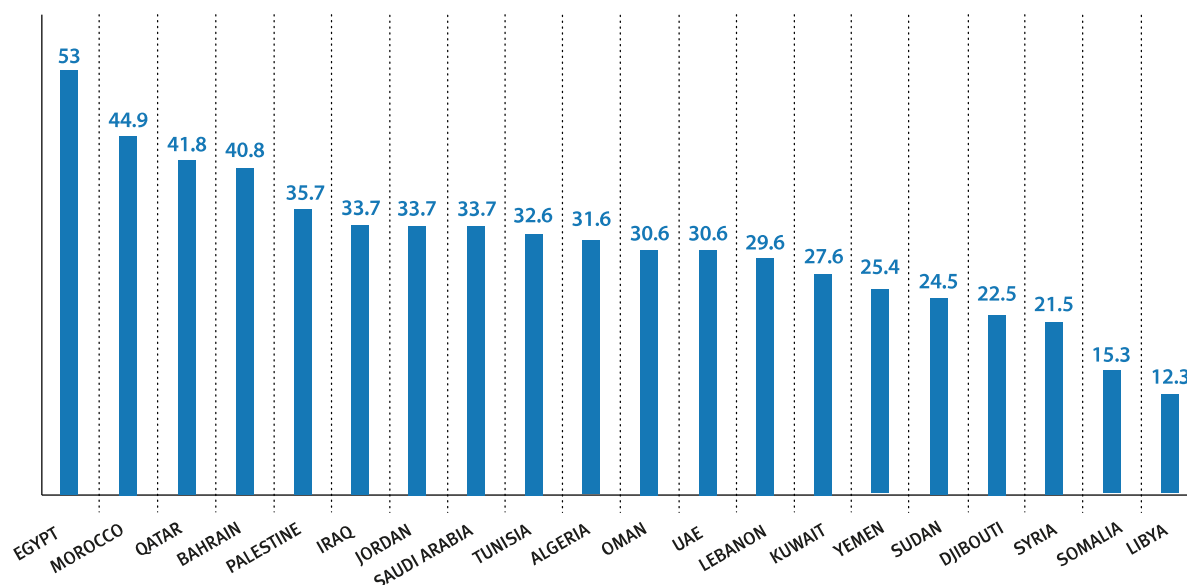
Source: The World Bank (2022). DataBank: Gender Statistics. <https://databank.worldbank.org/source/gender-statistics>.

**Figure 9. Types of intimate partner violence reported during previous twelve months by ever-married women in the State of Palestine in 2011 and 2019 (%)**



Source: PCBS (2019). Preliminary Results of the Violence Survey in the Palestinian Society. <http://www.pcbs.gov.ps/Downloads/book2480.pdf>.

**Figure 10. Availability of indicators needed to monitor gender-related SDGs**



Source: UN-Women – Women Count (2022). <https://data.unwomen.org/>.

## Sexual and Gender-Based Violence Related to Lockdown Measures

There is compelling, nationally representative data from several Arab states suggesting an increase in violence against women following the COVID-19 pandemic. A recent UN Women-led cross-sectional survey of 16,462 adults across nine Arab countries found that approximately 20 per cent of women in each of the included countries described concerns about intimate partner violence.<sup>297</sup> Interestingly, there was a significant rise in reported internet-based violence against women since the onset of the pandemic, with as many as 42 per cent respondents in Egypt observing harassment against women. Roughly half of respondents felt that women were experiencing a greater risk of intimate partner violence since the onset of the pandemic. While the majority of respondents noted that violence against women should be a major priority, anywhere from 31 per cent participants in Tunisia to 52 per cent participants in Yemen, or roughly a third of all respondents, felt that a woman “should tolerate domestic violence to keep her family together.” Along these lines, nearly 50 per cent of Libyan women responding to a separate UN Women-led survey reported concerns about increasing domestic violence.<sup>298</sup> There have been at least four cases of spousal femicide in Libya during the Spring 2020 lockdown.<sup>299</sup>

Below, we summarize the current empirical evidence from seven Arab states in support of escalating rates of violence against women in the context of the COVID-19 pandemic.

### Egypt

A nationally representative cross-sectional survey of 1,518 Egyptian adult women assessing GBV during the COVID-19 pandemic found that 11 per cent of married women surveyed reported experiencing some form of violence in the week preceding the survey.<sup>300</sup> Over 80 per cent of those reporting violence described verbal assault, while approximately 23 per cent described physical violence. Notably, approximately 60 per cent of women experiencing intimate partner violence stated that they had not been exposed to violence prior to the pandemic. Nearly 20 per cent of respondents reported an increase in any form of violence among family members since the onset of the pandemic while 33 per cent described a rise in household tensions.



## Iraq

Some 164 SGBV cases were reported to UNFPA-supported centres in Iraq in the several months following the onset of the pandemic through July 2020.<sup>302</sup> A mixed-methods study of 207 adults and adolescents (58.5 per cent female; N=121) living in the Kirkuk, Diyala, and Sulaimaniyah governorates of Iraq, as well as 20 key informant interviews, found that over 70 per cent of respondents in one rural district perceived a rise in violence against women related to the pandemic.<sup>303</sup> Of these, 84 per cent cited emotional violence, 78 per cent economic violence, and 65 per cent physical violence, which is roughly in line with reports from elsewhere in the region. Similarly, a review of an unpublished report on the impact of COVID-19 on gender-based violence in Iraq indicates a 65 per cent increase in or exacerbation of one or more forms of GBV in varying regions of the country, with 94 per cent of cases related to domestic violence perpetrated by a spouse or other related cohabitant.<sup>304</sup> A theme emerging from a qualitative component of the study suggests that men are simultaneously experiencing stress due to the grim economic consequences of the pandemic as well as frustration with the lockdown preventing them from working or socializing outside of their households, and that such circumstances could be contributing to an increase in intimate partner violence.

## Jordan

In Jordan, several studies have implicated pandemic-related economic stressors and food insecurity in the observed rise in domestic violence.

A cross-sectional study of a non-representative sample of 687 Jordanian adult women found that a staggering 40 per cent of participants reported experiencing violence during the COVID-19 pandemic, three quarters of whom had not been previously exposed to violence.<sup>309</sup> The most common form of violence identified was that from an intimate partner, as 77 per cent of survivors indicated living with and 71 per cent reported parenting a child with their abuser. Troublingly, 62 per cent of women described being prohibited by their abuser from seeking help, while 66 per cent and 37 per cent reported fearing for their personal safety and their children's safety, respectively. Independent predictors of violence identified in this study included marriage ( $p<0.001$ ) and unemployment/economic dependence ( $p<0.001$ ).

Another study of Jordanian and Syrian refugee women found that 62 per cent of women perceived increased vulnerability to either physical or psychological violence since the onset of the pandemic, citing an increase in "household tensions" and/or food insecurity as major precipitants of violence.<sup>310</sup> The perceived risk of violence was correlated with the number of individuals residing in the household, as nearly 60 per cent of women living in households with at least five persons, as compared with 29 per cent of women living in 3-5 person households and 12.5 per cent of women living in 1-3 person households perceived an increased risk of violence.

Food insecurity may be a significant predictor of domestic violence, as 54 per cent of women who described an increased SGBV risk also reported relying upon other households, neighbours, or family for food.<sup>311</sup> Further, the vast majority of women surveyed had either consumed their savings to fulfil basic needs such as food and shelter, or were in debt to meet those needs. Over 75 per cent of those in debt have faced greater difficulties in repaying debt as a result of the pandemic and approximately half of these report being threatened by their lenders.<sup>312</sup>

Another study of 397 adolescent and adult Jordanians and Syrian refugee service recipients in geographically distinct areas of Jordan found that nearly 70 per cent of respondents cited a perceived rise in GBV since the onset of the pandemic, with emotional and physical violence cited as the two most common forms, typically due to an intimate partner or relative.<sup>313</sup> Of note, nearly 20 per cent of women and girls described cyberbullying, while 8 per cent of women and 11 per cent of girls cited rape as the most prevalent form of violence. Most respondents felt that the economic stressors related to the pandemic, in addition to home confinement, were the most significant contributors to violence against women.

## Lebanon

A number of women's organizations in Lebanon have observed increased reports of gender-based violence and harassment, both in homes and community settings, as compared with prior years. For instance, ABAAD, a Lebanese NGO that advocates for gender equality, reported a near 300 per cent increase in the number of calls to their SGBV helpline in April 2020 as compared with April 2019.<sup>322</sup> Troublingly, ABAAD reported three cases of threatened femicide precipitated by women demonstrating symptoms of COVID-19.<sup>323</sup>



Similarly, the International Rescue Committee (IRC) reported an over 100 per cent increase in the number of women and girls in Lebanon seeking SGBV care in March and April as compared with January and February of 2020.<sup>324</sup> The Lebanese Internal Security Forces reported a 100 per cent increase in calls to their domestic violence hotline in March 2020 as compared with March 2019, and over 150 per cent increase in April 2020 as compared with March 2020.<sup>325</sup>

Kafa, a Lebanese NGO that advocates for gender equity and elimination of SGBV, received 938 calls for SGBV-related assistance in May 2020, representing a 200 per cent increase since March 2020.<sup>326</sup> The organization reports that 152 of these were from first-time callers, compared with 105 new care-seekers in April. Many of the cases are reportedly related to psychological, verbal, and physical abuse from a spouse, with descriptions of “attempts to choke”, “beating using a chair”, “threats of...being thrown on the street or separation from children” and “interdiction to contact the outside world.” The NGO partially attributes the rise in calls to a recent increase in femicide, with six cases reported in April 2020 possibly motivating other victims of abuse to seek help out of concern that they may experience a similar outcome.<sup>327</sup>

The Inter-Agency Task Force on SGBV in Lebanon conducted a cross-sectional study of 562 female survivors of violence in geographically diverse areas of Lebanon and SGBV service providers to determine the impact of the pandemic on SGBV in Lebanon.<sup>328</sup> Over 50 per cent of respondents reported observing a rise in gender-based violence in their communities and/or households, with emotional abuse (79 per cent), physical violence (55 per cent), denial of resources (53 per cent), sexual violence (32 per cent), discrimination (31 per cent), and threat of eviction or deportation (15 per cent) cited as the most common. The home was the most commonly reported site of violence (85 per cent), followed by public places such as streets (39 per cent) and markets (21 per cent).

There has also been a marked rise by 184 per cent in cybercrimes against women during the lockdown in Lebanon, with the majority of victims of this violence being adolescents under 26 years of age.<sup>329</sup> According to one NGO, there are also reports of increased violence against LGBTQI+ community members as a result of being confined with homophobic and transphobic relatives, with reports of corrective rape, forced heterosexual marriage, anal examinations, conversion therapy, and denial of access to hormones. Such abuses have been associated with increased risks of suicide in this context.

## **Palestine**

Several anecdotal reports and studies conducted in Palestine indicate an increase in GBV since the onset of the pandemic. The first of these is a cross-sectional study of 800 Palestinians done in March 2020 which found that women were more concerned than men about an increase in “societal violence” (42 per cent versus 35 per cent), violence against women (41 per cent versus 29 per cent) and violence against children (40 per cent versus 31 per cent) related to the pandemic.<sup>305</sup> A follow-up survey of 650 employed Palestinians, including 52 per cent or 338 women, demonstrated that 53 per cent of respondents voiced concerns about rising violence against women, representing a 51 per cent increase in this expectation as compared with the initial survey done several weeks prior.<sup>306</sup>

Another mixed-methods study of two cross-sectional surveys among 800 Palestinian adults and 17 key informant interviews found that approximately 40 per cent of survey respondents felt there would be an increase in community-based violence and 33 per cent were concerned about a rise in domestic violence as a consequence of the pandemic.<sup>307</sup> One women’s organization reported receiving 510 telephone consultations, including 206 directly pertaining to SGBV, during a two-week period in the lockdown, which they described as an increase. Some key informants felt that the rise in domestic violence could be attributed to economic violence and tensions related to financial stressors, which even prior to the pandemic were worsened by drastic cuts to UNRWA funding over the past year.

UN Women conducted a separate survey of governmental, civil society, and other partners in the State of Palestine to determine the impact of the pandemic on intimate partner violence across the country.<sup>308</sup> Over 50 per cent of service providers reported an increase in domestic violence, with the most common form being emotional violence, followed by verbal and physical violence. This trend was attributed to increased time spent in confinement with abusers.

## Somalia

A mixed-methods study of a nationally representative sample of 756 Somali adolescents and adults and 318 GBV service providers in Somalia sought to determine the impact of the COVID-19 pandemic on GBV and female genital mutilation (FGM) trends and GBV service provision.<sup>301</sup> Approximately 70 per cent of service providers and nearly 40 per cent of all community members perceived an overall rise in GBV since the pandemic, while 14 per cent of female respondents specifically reported increased exposure to physical violence. Interestingly, 10 per cent of men surveyed confirmed this increased violence against women in households. Of all the forms of violence cited, physical violence (34 per cent) was the most common, followed by sexual violence and harassment (20 per cent), and rape (18 per cent). Over 50 per cent of participants who reported an increase in rape lived in the Somaliland region of Somalia, where the prevalence may be higher. Similarly, 31 per cent of survey respondents felt that there was a rise in FGM since the onset of the pandemic, whereas 34 per cent perceived a decrease, and 35 per cent cited no change. There were geographic differences noted, however, with both community respondents and service providers in Somaliland more likely to report a perceived increase in FGM. Reasons described for the possible increase in FGM included school disruptions (39 per cent), income for traditional birth attendants (28 per cent), and poor weather (19 per cent), which may cause girls to remain indoors and thereby increase their potential exposure to FGM.

## Tunisia

Tunisia was the first country in the region to publish a peer-reviewed study on SGBV in the setting of the COVID-19 pandemic. The cross-sectional study of a nationally representative sample of 751 Tunisian women sought to determine the effects of the pandemic and its related lockdown measures on gender-based violence. The investigators found a significant increase in violence against women, which rose from 4.4 per cent prior to the pandemic to 14.8 per cent following the lockdown ( $p < 0.001$ ).<sup>314</sup> The risk of violence was greatest among those women who had experienced some form of violence prior to the pandemic (OR 19.34; 95 per cent CI 8.71-43.00;  $p < 0.001$ ). The most common form of violence experienced was emotional/psychological, cited by 96 per cent of women who reported abuse, followed by economic (41 per cent) and physical violence (10 per cent). Gender-based violence during the lockdown was found to be significantly associated with both negative mental health outcomes, including depression, anxiety and stress ( $p < 0.001$ ), as well as Facebook addiction ( $p < 0.001$ ). Nearly 90 per cent of women who reported abuse did not seek assistance.

Additional anecdotal reports and surveys in Tunisia support these findings. Since the onset of the pandemic, for instance, there has been a 400 per cent increase in calls to SGBV helplines in Tunisia.<sup>315</sup> One women's hotline reported a fivefold increase in calls during the first several days of lockdown alone.<sup>316</sup> During a one-week period in March 2020, 40 women reported cases of SGBV as compared with 7 women during the same period in 2019. Two of the cases required hospitalization.<sup>317</sup> Civil society organizations have also established SGBV hotlines in light of the rise in violence and similarly have reported a rise in SGBV cases. Over a two-week period in April 2020, for instance, one group reported that 43 women, including 30 first-time users, reached out for psychosocial and legal support.<sup>318</sup>

In general during the initial lockdown period in 2020, approximately 9,800 calls were made to women's hotlines, a figure roughly nine times greater than what would typically be received during that time.<sup>319</sup> Approximately 2,700 of these calls were regarding some form of violence against women and could be further broken down as follows: 90 per cent of callers reported verbal abuse, 80 per cent reported emotional abuse, 76 per cent described physical abuse, 37 per cent reported economic violence and 17 per cent described sexual assault. Economic violence in particular has increased precipitously during the lockdown, from 7.1 per cent according to a national SGBV survey in 2010, to 37 per cent this past spring. Notably, a 24-hour SGBV hotline established in February of this year noted that 77 per cent of the 1,425 cases reported over roughly the first month of lockdown cited the victim's husband as the abuser.<sup>320</sup>

A recent survey of 1,508 Tunisian adults, including 502 women, showed that 40 per cent of men surveyed versus 24 per cent of women felt that women should tolerate violence in order not to disturb their family structures during the pandemic.<sup>321</sup>

## Limited Resource Availability During Lockdowns

A multi-national survey of over 16,000 adults in the Arab world found that, prior to the pandemic, fewer than 40 per cent of female victims of violence in the Arab region were estimated to seek help, a figure that has dropped further since the onset of the pandemic and associated lockdowns, with only roughly 23 per cent of women experiencing violence in Morocco and 38 per cent

in Iraq reporting the incident.<sup>330</sup> Interestingly, the study noted that the types of services sought by women survivors of violence varied across contexts. For instance, in most countries, women relied upon authorities and judicial systems for support, whereas in Palestine and Yemen, women depended primarily on family and friends.

In most cases, first responders that women had historically relied upon for protection, which include judicial, police, and health services, have either dramatically decreased or altogether ceased operations during the pandemic. The diversion of resources has also affected women's civil society organizations, some of which have been converted to health care centres during the pandemic.<sup>331</sup> In Somalia, where hundreds of service providers have described a reduction in SGBV services due to the pandemic, one study found that over 50 per cent of women and girls were unable to access SGBV services, with the most common reasons cited were lack of resources (24 per cent), lack of a similar-gendered provider (16 per cent), distance (12 per cent), safety concerns traveling (10 per cent), and restrictions by a family member (7 per cent).<sup>332</sup>

The IRC published an analysis of its own data providing gender-based violence services in low-income and conflict-affected settings, and found that, in the context of lockdowns with increased isolation, there was an overall decline in reported cases of sexual- and gender-based violence.<sup>333</sup> This trend has been most apparent in settings in which SGBV services have been discontinued as a consequence of the pandemic, as was observed in Iraq, where the IRC attributed an artefactual delay of two months without a single SGBV case to a lack of awareness of remote services amidst strict lockdown measures.<sup>334</sup>

Stringent lockdown measures have resulted in the closures of women's centres and organizations advocating against SGBV. As seen elsewhere, a majority of women who report experiencing SGBV additionally describe being unaware of how and where to access resources, a trend observed among 90 per cent of women in one rural district of Iraq.<sup>335</sup> Interestingly, when informed of SGBV resources, most participants expressed reservations against using a hotline citing concerns around confidentiality, which may reflect distrust in state-led services following decades of conflict and corruption. Activists in Iraq warn that the pandemic may embolden patriarchal cultural norms, particularly as the judicial system temporarily suspends hearing of cases, as women survivors of violence may rely solely upon their father or other male community leaders for help with intimate partner violence, potentially resulting in continued abuse or a suspension of their custodial rights.<sup>336</sup>

Similarly, in Tunisia, fewer women than usual have been registering SGBV complaints with authorities. A recent study found that only 26 per cent of women experiencing violence since the onset of the pandemic sought assistance or filed a complaint.<sup>337</sup> In fact, the Minister of Interior reported a 62 per cent decrease in the number of complaints from April 2019, which saw 3,297 cases, to April 2020, which saw only 1,268.<sup>338</sup> This may be the result of diminished capacity among authorities to receive and process complaints, and also challenges women face in accessing police stations and other resources in the setting of a lockdown.

In Palestine over roughly the same period, the Palestinian Civil Police and Public Prosecutors Office have both reported a decrease in domestic violence cases.<sup>339</sup> At the same time, women's organizations have also experienced a decline in operations as a result of the pandemic, with 43 per cent reporting disruption to services, 33 per cent reporting fewer staff, and 7 per cent shut down altogether.<sup>340</sup> The reasons for this downsizing are both economic and related to lockdown measures as well as staff fears of contracting COVID-19. Instead, organizations are turning to remote services, which may not be accessible to the most vulnerable women. Along these lines, shelters are no longer accepting new cases requiring accommodation because of fears of COVID-19 transmission to existing users. Courts have also stopped in-person hearings because of the pandemic and are attending only to "essential" cases under the national state of emergency, which does not include orders of protection for women experiencing violence.<sup>341</sup>

In Jordan, too, one mixed-methods study of 360 adolescent and adult Jordanian and Syrian refugees and 28 key informants found that the number of officially reported GBV cases has decreased by 68 per cent since the beginning of the pandemic, suggesting that women may not be able to access resources during stringent lockdown measures.<sup>342</sup> Many of the women and service providers interviewed felt that social stigmatization was a major barrier to seeking assistance, as was home confinement with a spouse or relative perpetrating the violence, particularly as anywhere from 30-50 per cent of adolescent girls and 15 per cent of adult women interviewed did not have sole access to a mobile phone.

The exceptions to this trend have been in settings with less stringent mobility restrictions which thereby permit continued access to services. For instance, in Lebanon, where lockdown-related mobility restrictions were strictest among refugees living in camps and informal tented settlements, women's groups noted a decline in SGBV cases among Syrian refugees, compared with a marked increase among Lebanese women.<sup>343</sup> Whereas previously, the cohort seeking SGBV care constituted approximately 55 per cent Lebanese women and 45 per cent Syrian women, these figures shifted to 70 per cent and 30 per cent respectively in the month of March alone.<sup>344</sup>

Yet, even in Lebanon, women have been confronted with new obstacles to accessing SGBV services in the context of the pandemic. A cross-sectional study of over 500 women and girls found that while 75 per cent were aware of where they could access appropriate resources, only 50 per cent have actually been able to do so.<sup>345</sup> A major barrier from accessing resources in Lebanon may be cost, particularly given the recent economic decline, with one study estimating that 41 per cent of women versus 29 per cent of men in Lebanon have lost all sources of income since the onset of the pandemic.<sup>346</sup> For instance, the National Domestic Violence hotline is not free, which makes it inaccessible to many survivors of violence.<sup>347</sup> In a cross-sectional study of 562 female survivors of violence in Lebanon, the overwhelming majority of the 50 per cent of respondents who sought SGBV services during the lockdown did so remotely, while only 12 per cent received in-person care.<sup>348</sup> A staggering 33 per cent of participants noted being unable to access remote SGBV services, with nearly 50 per cent of those citing limited telephone accessibility, 45 per cent describing feeling unsafe accessing services while in confinement in their homes, and 6 per cent reporting outright restriction of telephone usage by their partner or relatives.<sup>349</sup>

Additionally, female victims of domestic violence have experienced difficulties in finding shelter from their abusers. Many fear transmission of SARS-CoV-2, as shelters for women survivors of violence are either at capacity or unwilling to accept new residents without proof of negative COVID-19 testing, which may be prohibitively expensive for some women to obtain.<sup>350</sup> Similarly, women seeking shelter for SGBV in Palestine and Iraq must first self-quarantine without safe alternative.<sup>351</sup> In Jordan, strict quarantine measures prevented women from accessing shelters, while in Morocco, shelters were at full capacity and no longer accepting new cases.<sup>352</sup>

In general, many services being offered remotely may not be feasibly accessed by women who lack reliable internet or telephone connectivity. Kafa reported a perceived increase in texts and social media messages among women experiencing SGBV, possibly because women feel safer communicating through such means while confined with their abusers.<sup>353</sup> Yet, many women lack access to or do not feel safe using such modalities which may be controlled by their spouses.

Finally, there are reports of physicians in Lebanon refusing to examine women survivors of violence due to fear of COVID-19 transmission, preventing them from receiving documentation of physical and/or sexual abuse and delaying any legal proceedings they may be pursuing.<sup>354</sup>

## Overcoming Challenges to Address Needs

Across the Arab region, civil society organizations, and to some extent governments as well, have stepped up to respond to this “shadow pandemic” of violence against women. Many of these measures require virtual technology, further emphasizing the importance of closing the digital gender gap, particularly as those women at greatest risk of violence may also be the least likely to access the Internet.

**“ Many of these measures require virtual technology, further emphasizing the importance of closing the digital gender gap, particularly as those women at greatest risk of violence may also be the least likely to access the Internet. ”**

## *Utilizing Virtual Platforms to Establish Remote Services*

The effects of the pandemic on violence against women are being publicized and shared via social media, radio, and television in multiple countries in the region. Several countries, including Tunisia and Palestine, have scaled up existing SGBV resources like telephone hotlines providing psychosocial support for survivors of violence such that they are available 24 hours per day.<sup>355</sup> Similarly, the Regional Council of the College of Physicians and the Moroccan Society of Psychiatry are providing virtual psychosocial support for survivors of violence.<sup>356</sup> In Sudan, a COVID-19 task force established the country's first GBV hotline.<sup>357</sup> In Egypt, UNHCR is conducting remote case management and 24/7 SGBV hotlines for women survivors of violence. Remote SGBV services are also available in Iraq through UNHCR.<sup>358</sup>

## *Enacting Judicial Reforms and Facilitating Virtual Legislation*

Throughout the Arab states, GBV is often condoned by religious courts, which in some settings even legitimize physical violence and femicide.<sup>16</sup> Arab and Muslim family laws in many cases further inflict implicit violence on women, for instance by necessitating spousal permission for work, travel, or independent banking transactions, reinforcing women's dependence upon men.<sup>16</sup> Supported by patriarchal cultural norms, such legal barriers to women's autonomy are magnified in the context of the pandemic, as compounding health and economic crises may increase women's financial reliance upon their potential abusers, while the suspension of courts and public institutions limits opportunities for recourse.

Encouragingly, some countries have taken steps to address these obstacles and make legal justice more accessible to women in the current circumstances. In Morocco, for instance, the National Union of Moroccan Women has developed a country-wide mobile application that allows for the virtual filing and processing of SGBV cases and, in cases of imminent danger, directs claims to the appropriate authorities who can utilize the platform's geo-localization feature to locate victims and intervene.<sup>258</sup>

Similarly, in response to the apparent rise in violence against women in Lebanon, several key judicial decisions have increased protections for women, particularly in the context of the pandemic and lockdown, mandating immediate judicial review of all domestic violence cases filed during lockdown and establishing virtual procedural protocols.<sup>359</sup> In the case of Lebanon, two days after this protocol was enacted, a woman who had filed a complaint against her husband was given an online order of protection for both herself and her children, and soon thereafter, courts were attending to and issuing protections for other women who filed virtual requests as well.<sup>360</sup> However, despite these advances, there remains to be widely implemented legislation on a national level in Lebanon protecting women and children victims of violence.

In Tunisia, various ministries and family courts that had been initially closed during the lockdown resumed operations, specifically citing the need to issue orders of protection for female survivors of violence. Of the 4,263 court proceedings heard during the first two months of the lockdown, only 124, or 3 per cent, were related to violence against women and children, which is thought to be reflective of prosecutors prioritizing only serious cases of physical and sexual violence.<sup>361</sup> Women's advocacy groups successfully appealed to the Supreme Council of the Judiciary in Tunisia to facilitate the filing and processing of women's protection cases in light of the lockdown, in order to take decisive action against the observed rise in violence.<sup>362</sup> As a result, women experiencing violence were able to seek protective shelter for themselves and their children, obtain health care services, and have their abusers physically removed from their homes.

# Section 7

## Unique Considerations for Subpopulations of Women

### Introduction

The intersectionality of competing vulnerabilities – armed conflict exposure, forced displacement, migration and severe food insecurity, in addition to frontline COVID-19 exposure – likely confers varying degrees of risk with regard to COVID-19 transmission and severity, sexual and gender-based violence, mental illness, and a decline in general and sexual and reproductive health. We therefore present below sub-populations of women whom we believe merit unique considerations with respect to both their risk of COVID-19, and the approach to mitigating this risk.

### Forcibly Displaced Women: The Case of Syria

#### Introduction

As of June 2020, the Syrian civil conflict has internally displaced 6.2 million persons and left more than half of its population in need of humanitarian assistance.<sup>363</sup> An additional roughly 6 million persons have sought refuge in neighbouring low- and middle-income countries.<sup>364</sup> The already precarious vulnerability of Syrian women has been exacerbated by the pandemic, with an unequal rise in unpaid domestic work, insufficient mental and sexual and reproductive health care, a rise in gender-based violence and disproportionate economic insecurity.<sup>365</sup> In December 2019, not long before the first case of COVID-19 was diagnosed in Syria, fighting in northwest Syria and western Aleppo displaced nearly one million people, of whom 80 per cent are women and children, from their homes and into overcrowded makeshift camps.<sup>366</sup>

#### COVID-19 and Health Care Accessibility

The ongoing conflict in Syria poses multiple public health challenges for women. For instance, a lack of clean water in some regions has rendered hand hygiene, a fundamental tenet of infection prevention, essentially impossible. The Al-Halouk water station which served approximately 480,000 people in Northeast Syria, including the 65,000 residents of the Al-Hol camp, of whom 90 per cent are women and children, sustained substantial damage in October 2019 resulting in widespread water shortages which persisted into 2020.<sup>367</sup> In much of Northeast and Northwest Syria, living conditions do not meet internationally acknowledged humanitarian shelters of one toilet and shower for every 20 persons.<sup>368</sup>

The Syrian health infrastructure and workforce have been decimated by nine years of war and deliberate weaponization of health systems. Between March 2011 and February 2020 there were 595 deliberate attacks on health care facilities, killing 923 health care workers. Additionally, over 70 per cent of the remaining health care workforce has emigrated. Health care provision is further complicated by the coexistence of multiple autonomous health systems operating in geographically and politically diverse regions, with approximately 40 per cent of hospitals across the country effectively non-functional.<sup>369</sup>

Syrian women have long been disproportionately affected by the deliberate targeting of health care facilities, with at least 34 facilities specializing in women or children's health care besieged between 2014 and 2017.<sup>370</sup> The last remaining maternity hospital in western Aleppo with a catchment area of over 300,000 individuals was attacked in February 2020. In addition to physical destruction, these deliberate assaults have instilled fear in some women, who opt against seeking medical care for fear of bombing.<sup>371</sup>

Due to limited testing capacity, the true prevalence of COVID-19 is not known in Syria, though the estimated 50 per cent positivity rate (as of late August 2020) suggests a major public health crisis.<sup>372</sup> Additionally, because of sanctions and restrictions on incoming aid, some humanitarian groups have described “impossible” conditions for the diagnosis and treatment of COVID-19.<sup>373</sup> Limited health care capacity with fragmented systems, increasingly dire socio-economic conditions, and poor surveillance infrastructure have ignited concerns of unmitigated infection during the 2020-2021 winter season.<sup>374</sup>

In Al-Hol camp, the already fragile health care system is facing serious threats as a growing number of the health care workforce become infected. Humanitarian activists on the ground have warned that the camp is not well-prepared for COVID-19, citing the lack of hygiene infrastructure and limited health care resources including capacity for piped oxygen.<sup>375</sup> The number of operational health facilities serving the camp continues to decline as a result of dwindling workforce, related to COVID-19; of the 24 primary health care clinics in the camp in May 2020, only five were operational three months later. Similarly, all three field hospitals operate at reduced capacity.

### *Distress, Anxiety and Depression*

The WHO estimates that 21 per cent of residents in Idlib in northwest Syria and 14 per cent in Raqqa in northeast Syria experience daily symptoms of anxiety and depression that predated the pandemic.<sup>376</sup> This burden of mental illness is feared to have increased substantially this year. Women Now, a Syrian women-led advocacy group, interviewed 69 displaced women in rural areas of Idlib and Aleppo in May of 2020.<sup>377</sup> Of those interviewed, 71 per cent indicated feeling unsafe with regard to COVID-19 and secondary displacement and 79 per cent reported high stress levels as a result of these fears, 69 per cent reported concerns regarding the paucity of health care resources in the setting of a pandemic, and 41 per cent described “psychosomatic disorders” with symptoms that included “headaches, joint infections, skin problems, and weakness.” Additionally, 17 per cent of respondents described being victims of SGBV and 5 per cent declined to respond. Several women indicated that the violence was motivated by the pandemic and subsequent lockdown.

Following the nation-wide lockdown in March 2020, in which widespread mobility restrictions and school closures confined children to their homes, Women Now reported an increase in calls from mothers who are struggling to address their children's anxieties, as many children equate closed schools with impending armed conflict and possible displacement.<sup>378</sup> The lockdown has also necessarily resulted in the closure of community organizations that provided psychosocial support to women. Though some have attempted to increase their virtual presence in response, most vulnerable women lack Internet or telephone access and therefore may be overlooked.

### *Syrian Refugee Women: Lebanon Case Study*

There are an estimated 1.5 million registered and unregistered Syrian refugees displaced in Lebanon, of whom approximately 79 per cent are women and girls.<sup>379</sup> Over 70 per cent of Syrian refugees in Lebanon are estimated to lack current residency documentation, which may dissuade many from seeking COVID-19 testing when symptomatic.<sup>380</sup> Other barriers to care impacting Syrian refugee women in Lebanon prior to the pandemic, such as costs and fear of discrimination, may also limit health care accessibility during the current crisis as well.<sup>381</sup>

In Lebanon, arbitrary curfews imposed on refugee – but not host – communities under the pretence of infection prevention can exacerbate health disparities.<sup>382</sup> Two NGOs, Amel Association and Médecins Sans Frontières, which operate rural clinics primarily serving refugees, migrants, and vulnerable Lebanese, noted a 30 percent decline in clinic attendance following the onset of the pandemic, a trend thought to be driven primarily by selective mobility restrictions enacted on refugee communities.<sup>383</sup> A recent mixed-methods study of Lebanese and Syrian refugee NGO beneficiaries in Lebanon found that since the onset of the pandemic, Syrian refugee women and adolescent girls experienced greater mobility restrictions as compared with men, due to concerns about harassment, contracting the virus, and being arrested.<sup>384</sup> These findings were supported by those of a qualitative study of Lebanese, Syrian, and Palestinian adolescents in Lebanon, which found that girls, but not boys, described an increase in household violence since the onset of the pandemic, a trend most consistent among refugees, and particularly married Syrian girls who reported a rise in intimate partner violence.<sup>385</sup>



## Female Health Care Workers

### Introduction

The WHO National Health Workforce Accounts estimates that in the Eastern Mediterranean region, women represented 78 per cent of all nursing personnel and 35 per cent of physicians in 2019.<sup>386</sup> Female health care workers in the Arab states may be overrepresented on the frontlines of the COVID-19 pandemic. For instance, in Palestine, where women comprise 60 per cent of those employed in the care sector, they represent 70 per cent of frontline health care workers, with over 12,500 female nurses and medics employed in Palestine.<sup>387</sup> **Figure 11** outlines gender ratios of different cadres of health care workers in the Arab states, where data is available.

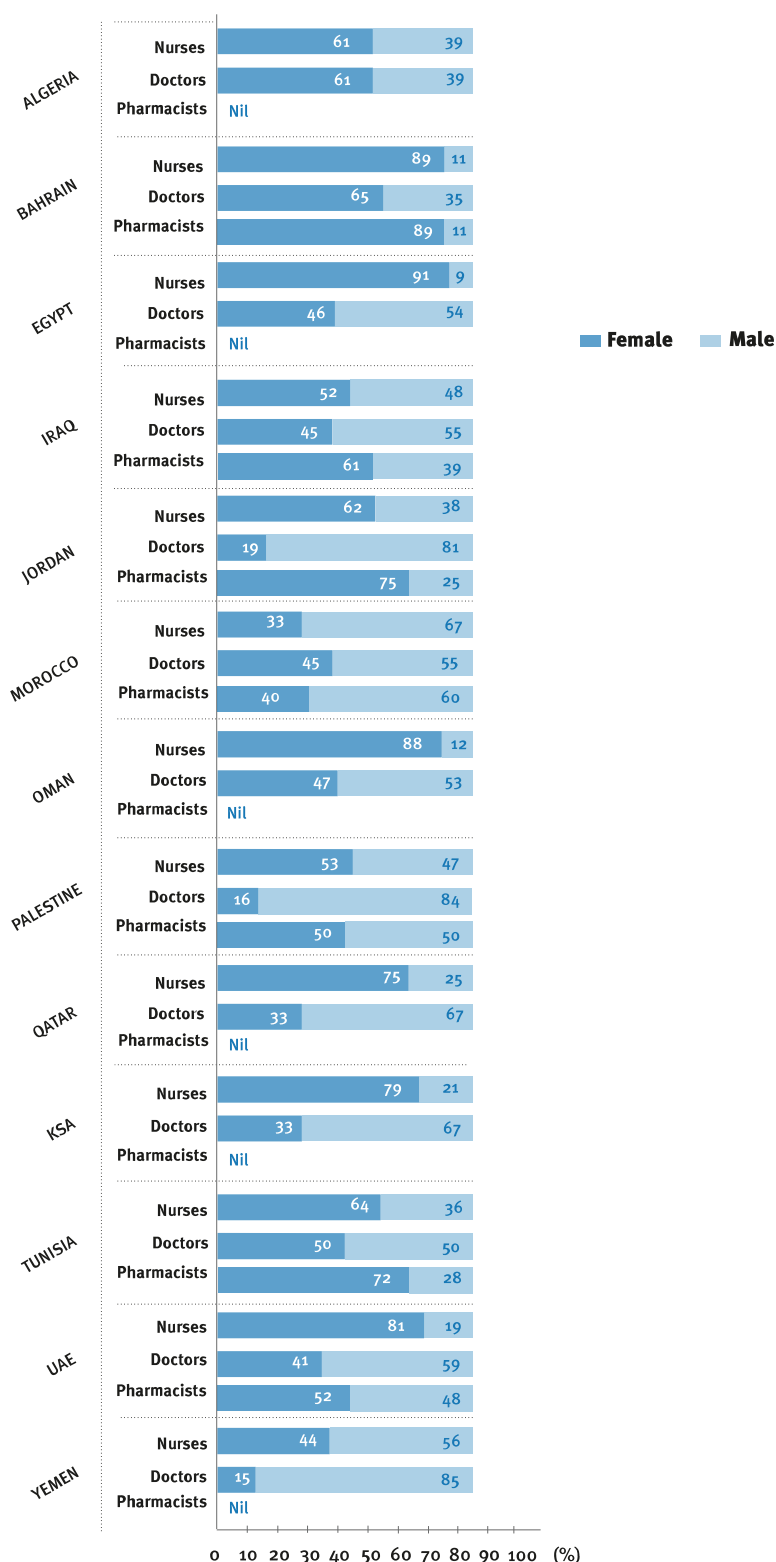
Only 11 of 187 countries have provided sex-disaggregated COVID-19 data among health care workers.<sup>388</sup> A major limitation of the global data on this population is the ambiguity and variability in the definition of a “frontline” worker, which may lead to the inadvertent exclusion of high-risk subpopulations such as ancillary and custodial staff.

In the Arab states, the majority of peer-reviewed studies exploring the gendered impact of COVID-19 among health care workers are primarily focused on gender differences in knowledge, attitudes and behaviours. Many of these cross-sectional studies were conducted in the earlier days of the pandemic and produced conflicting results, often with unclear clinical significance. For instance, one study from Jordan exploring COVID-19 preparedness among frontline physicians found that men had higher “preparedness scores” as compared with women (5.2 versus 4.5;  $p=0.019$ ),<sup>389</sup> yet the association between “preparedness score” and clinical practice is not determined. Several of the papers in which women are found to be less prepared than men offer sexist, unidimensional arguments in support of their results. For instance, Suleiman et al. propose that female physicians “naturally” may be more concerned about “being at childbearing age, [have] more family concerns, or more anxiety thoughts”, suggesting that these competing interests may affect their knowledge of, or professional behaviours during the pandemic.<sup>390</sup>

Below, we summarize the available evidence on the gendered effects of the COVID-19 pandemic on health care workers in the Arab states, focusing on the occupational risk of COVID-19 transmission, work-site protections and mental health sequelae.



**Figure 11. Gender ratios of doctors, nurses and pharmacists in select Arab States for most recent year available\*\*\***



\* Data for Djibouti, Kuwait, Libya, Sudan and Syria are not available.

Sources: WHO. Global Health Observatory data repository. [https://apps.who.int/gho/data/node.main.HWFGRP\\_BYSEX?lang=en](https://apps.who.int/gho/data/node.main.HWFGRP_BYSEX?lang=en); WHO. Health Workshop Snapshots. <https://rho.emro.who.int/HWF-Snapshots>; National Human Resources for Health Observatory (2014). The Hashemite Kingdom of Jordan High Health Council/ General Secretariat. <http://hhc.gov.jo/uploadedimages/HRHReport2014.pdf>; UN-Women (2020). Women's Needs and Gender Equality in Lebanon's COVID-19 Response. <https://arabstates.unwomen.org/en/digital-library/publications/2020/03/gender-equality-in-lebanon-covid-19-response>; Ministry of Health, Bahrain. Human Resources. [https://www.moh.gov.bh/Content/Files/Publications/statistics/HS2017/PDF/Chapters/Human%20Resources\\_MoH%202017.pdf](https://www.moh.gov.bh/Content/Files/Publications/statistics/HS2017/PDF/Chapters/Human%20Resources_MoH%202017.pdf); UN-Women (2020). Gender and Crisis of COVID-19 in Tunisia: Challenges and Recommendations. [https://www2.unwomen.org/-/media/field%20office%20arab%20states/attachments/publications/2020/05/tunis%20COVID-19brief/un%20women\\_policy%20brief\\_gender%20and%20covid%20in%20tunisia.pdf?la=en&vs=2252](https://www2.unwomen.org/-/media/field%20office%20arab%20states/attachments/publications/2020/05/tunis%20COVID-19brief/un%20women_policy%20brief_gender%20and%20covid%20in%20tunisia.pdf?la=en&vs=2252).

<sup>4</sup> Estimates are approximate and based on multiple sources. More detailed data available for Jordan indicates that gender ratios among physicians vary slightly based on setting. For instance, 2014 data indicates women constituted 15% of Ministry of Health physicians, but up to 35% of physicians in other settings.

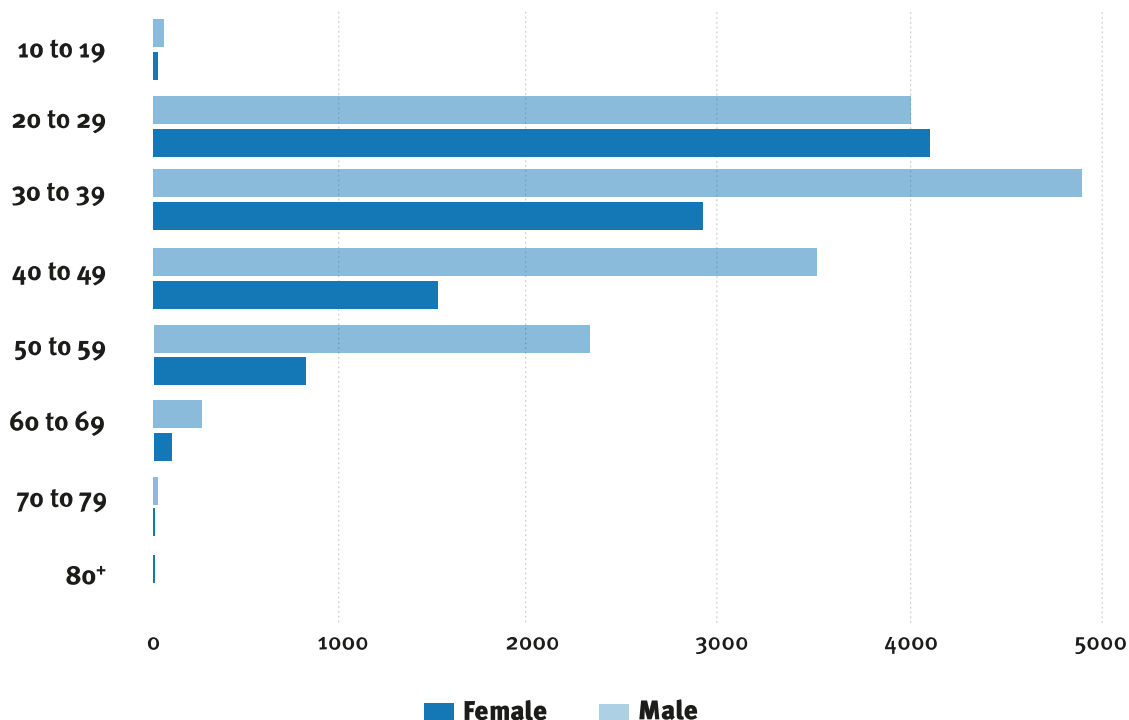
## Sex Differences and Gender Disparities in COVID-19 Incidence and Mortality

The WHO estimates that women account for half of COVID-19 cases among health care workers in the Eastern Mediterranean region.<sup>391</sup> Yet there are major knowledge gaps both among individual countries and region-wide on COVID-19 incidence and mortality rates among female health care workers. A systematic review examining COVID-19 incidence and mortality among health care workers during the early phase of the pandemic showed that the Eastern Mediterranean region had the world's highest case-fatality rate of 5.7 per 100 infected health care workers, compared to a global average of 0.92, though these findings were not disaggregated by gender.<sup>392</sup> In Qatar, a retrospective chart review and cross-sectional survey done on 16,912 health care workers tested for SARS-CoV-2 found an overall prevalence of 10.6 per cent, with men accounting for 65.6 per cent of positive cases.<sup>393</sup> However, baseline sex ratios of health care workers were not provided, making it difficult to interpret these results.

Iraq is the only country in the region publicly providing regularly updated data health care workers, stratified by gender. As of January 25th, 2021, women accounted for 39 per cent of infections among health care workers in Iraq and just 23 per cent of deaths.<sup>394</sup> No data on testing rates among male and female health care workers is available. **Figure 12** illustrates gender-stratified COVID-19 cases by age group among health care workers in Iraq.

Elsewhere, data is sporadic and limited. For instance in Lebanon, an April 2020 report estimated that women accounted for approximately 60 per cent of the country's 48 COVID-19 cases among health care workers.<sup>395</sup> Yet, updated sex-disaggregated figures have not been publicly released since that time, despite the fact that, as of January 23rd, 2021, some 2,357 health care workers are noted to have been infected in the country.<sup>396</sup> In Egypt, a cross-sectional analysis of 4,040 health care workers (61.5 per cent female) working at a public health care facility in Cairo found that 4.2 per cent of health care workers screened positive and that the majority of those testing positive were nurses (57.5 per cent), but that there were no statistically significant differences observed in prevalence among men and women.<sup>397</sup> Another cross-sectional study of 79 health care workers, of whom 60 per cent were women, working on a non-COVID-19 service at a university hospital in Cairo sought to determine the risk of SARS-CoV-2 infection in this population, which included physicians, nurses, administrators, and those employed in transportation and maintenance.<sup>398</sup> The study found that gender was not associated with COVID-19 in this population, though nurses were most likely to test positive for the virus. However, it is unclear if this study was powered to detect gender differences, or whether these findings can be reliably extrapolated to clinical settings of COVID-19 care in Egypt and elsewhere in the region.

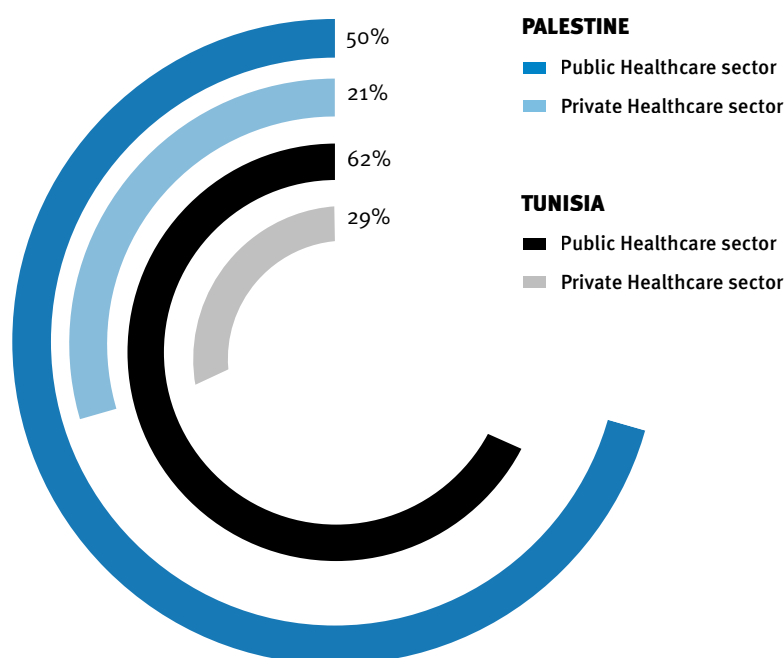
**Figure 12. Confirmed SARS-CoV-2 infections among health care workers in Iraq**



Source: COVID-19 Dynamic Infographic Dashboard for Iraq. 2021; <https://app.powerbi.com/view?r=eyJrjoiNjliMDhiYmItZTlhMSooMDIhLTg3MjltMD-NmM2FhNzE5NmM4liwidCl6ImY2MTBjMGI3LWJkMjQtNGZlOSo4MTBiLTNkYzI4MGFmYjU5MCIslmMiOjhg>.

Female health care workers in Arab countries may be overrepresented in the public sector, which may potentially translate into an increased risk of SARS-CoV-2 transmission. The feminization of public sector labour workforces in the Arab region, associated with women's increased access to education, has previously been extensively described.<sup>399</sup> (It is worth noting, however, that though women represent 43 per cent of public sector employees, they comprise only 12 per cent of managerial positions).<sup>400</sup> Similarly, data from Palestine and Tunisia indicates that female health care workers are more likely to be employed in the public, rather than private, health care sectors.<sup>401</sup> A cross-sectional study of 532 physicians (44.7 per cent female) in Libya similarly demonstrated that female doctors were more likely to be employed by the government, while male doctors more commonly had dual employment in the private and public sectors.<sup>402</sup> In some countries in the region, public hospitals are managing the majority of COVID-19 cases, which may make health care workers employed in the public sector more vulnerable to SARS-CoV-2 exposure and infection. **Figure 13** illustrates differences in health care sector employment for women in Palestine and Tunisia. More data is needed to understand differences in public versus private health care sector employment, and female health care workers' risk of infection.

**Figure 13. Female health care worker representation in the public and private sector in Tunisia and Palestine**



Sources: Gender and the crisis of COVID-19 in Tunisia: challenges and recommendations: UN Women; 2020; National Human Resources for Health Observatory: Mapping the Palestinian Health Workforce: Palestinian National Institute of Public Health, Palestinian Ministry of Health, World Bank, World Health Organization, Representative Office of Norway to the Palestinian Authority; 2019.

### Occupational Risks and Protections

Frontline female health care workers practicing in the Arab region face a number of occupational hazards and stressors that may influence their risk of COVID-19 illness and cause other harms. Some are relatively minor. For instance, a disproportionately high prevalence of hand ( $p < 0.001$ ) and face ( $p < 0.001$ ) dermatitis has been described among other populations of women, such as university students and faculty in Saudi Arabia, thought to be associated with increased hand hygiene practices.<sup>403</sup> Frontline health care workers at a university hospital in Casablanca were also observed to have a high prevalence (62 per cent) of PPE-associated headaches, further correlated with working shifts longer than 8 hours ( $p < 0.01$ ) and being a doctor ( $p < 0.05$ ), though no gender-based differences were detected.<sup>404</sup>

Other occupational hazards have more far-reaching implications. For instance in Tunisia, a country in which 13 per cent of all COVID-19 cases have been diagnosed among health professionals and where women represent the majority of the physician and nursing workforce, hospitals have not subsidized or provided childcare for female health care workers with competing domestic obligations.<sup>405</sup> Tunisian hospitals have additionally failed to implement special considerations for pregnant health care workers,

who are continuing their professional obligations during the pandemic.<sup>406</sup> Similarly, female health care workers in Syria, where women are thought to constitute a considerable proportion of frontline health workers though no data is available, do not have access to PPE or support services such as mental health counselling or childcare despite the additional stressors related to war, and in particular the targeted killing of 923 health care workers from March 2011 through February 2020.<sup>407</sup>

Shortages in PPE have been described in multiple settings. In Libya, for instance a sample of 174 primarily female obstetricians working in a variety of health care settings including public, private, university-affiliated, rural, tertiary, secondary, and primary care centres reported shortages in PPE, with 10 per cent citing a lack of gloves, 18 per cent describing a lack of masks, and roughly 37 per cent reporting no gowns.<sup>408</sup> Another study of physicians in Libya, this one of 118 cardiologists (41.5 per cent female) practicing across four tertiary care centres, demonstrated that 91.5 per cent of participants reported insufficient PPE while 21.2 per cent described a lack of guidelines on COVID-19 management in their institutions.<sup>409</sup> Notably, these findings were not stratified by gender.

Such scarcity of essential resources may have implications for political freedom and civil rights, particularly in countries under authoritarian rule. This was observed in Egypt, where women represent 46 per cent of the national physician workforce, and 91 per cent of the country's nurses.<sup>410</sup> Shortages there of PPE and stipulations that doctors continue working while ill themselves have contributed to the deaths of multiple physicians in the country, where the mortality rate among health care workers is among the highest in the world at 6.52 per cent. Yet those medical doctors who have spoken publicly against these shortcomings in the government's pandemic response have been met with punishment including arrest and termination of their employment.<sup>411</sup> Among these is a young, pregnant physician who was arrested under charges of "terrorism", "spreading false news", and "misusing social media", and remains in detention, after simply independently reporting a COVID-19 case to the Ministry of Health, rather than to her hospital managers.<sup>412</sup> In another case, several physicians at a Cairo hospital who resigned to protest the death of a colleague were coerced by Egypt's National Security Agency into continuing to work.<sup>413</sup>

Elsewhere in the region, ongoing economic struggles are impacting frontline health care workers. In Lebanon, for instance, the majority of nurses – 80 per cent of whom are women – have been confronted with an increase in the nurse:patient ratio from the recommended 1:8 to as high as 1:18, after working for months with reduced or no pay and insufficient PPE.<sup>414</sup> Many of those who have been exposed to COVID-19 in their work settings have been furloughed as they self-isolate. The Lebanese Order of Midwives recently conducted a survey that similarly demonstrated reduced salaries and unpaid leaves as major occupational stressors during the pandemic.<sup>415</sup>

### *Distress, Mental Illness, Stigma and Workplace Violence*

Female health care workers have been consistently shown to be more likely to perceive pandemic-related stressors in multiple settings across the region, a trend that may be associated with frontline COVID-19 exposure.

For instance, in a cross-sectional survey of 209 physicians (25.4 per cent female) across multiple specialties who work in various health care settings in Duhok city in Iraqi Kurdistan, female physicians had higher mean stress scores than their male counterparts and were more likely to perceive high (13.2 per cent vs. 8.3 per cent) and moderate (71.7 per cent vs. 68.6 per cent) stress levels ( $p < 0.001$ ).<sup>416</sup> Another cross-sectional analysis of 441 health care workers (72.8 per cent female) in Saudi Arabia determined that one third of the cohort met criteria for an anxiety disorder and that women were twice as likely as men to be diagnosed with an anxiety disorder (OR 2.102; 95 per cent CI 1.272-3.474;  $p < 0.01$ ).<sup>417</sup> A study of 150 intern nursing students (68.9 per cent female) working in university hospitals in Alexandria, Egypt found that men were less likely to report experiencing psychological distress (OR 0.17; 95 per cent CI 0.057-0.49;  $p < 0.001$ ), which investigators problematically hypothesized as the product of supposed sex-based neuroanatomical differences which enable men to regulate their emotions "with less effort and greater efficiency" than women, effectively dismissing the unique stressors experienced by female health care workers by virtue of their gender.<sup>418</sup> A cross-sectional survey of 355 undergraduate nursing students (72.7 per cent female) in Jordan found that women had slightly higher stress levels than men, primarily related to their future and competency ( $p < 0.05$ ), which authors' attribute to women's competing responsibilities at home, as well as men's cultural tendency not to express uncertainty.<sup>419</sup>

Common stressors cited in multiple studies include fear of illness, concerns about infecting a relative, and social isolation. In Egypt, a cross-sectional study of 407 health care workers (49 per cent female) working in different hospitals found that female participants were more likely to report fear of becoming infected with COVID-19 (OR 1.969; 95 per cent CI 1.004-3.860;  $p < 0.05$ ), a trend similarly observed among women in the general population.<sup>420</sup> Another study of 220 Egyptian doctors (49.6 per cent female) found that female physicians were more likely than their male counterparts to report emotional exhaustion, a finding which study authors attributed to women being "more empathetic" and concerned about others during the pandemic.<sup>421</sup> In Oman, a cross-sectional survey of frontline health care workers which included 59 physicians (50.8 per cent female) and 91 nurses (94.5

per cent female) found that more women had moderate-to-severe anxiety than did men (88.4 per cent vs. 11.6 per cent;  $p=0.04$ ).<sup>422</sup> In Saudi Arabia, a cross-sectional study of 529 physicians (40.3 per cent female) of various specialties found that of those who were under quarantine, 38.7 per cent reported concerns about poor social support while 38.7 per cent were concerned about unsatisfactory medical care. Female physicians were found to be more likely than their male counterparts to report experiencing fear (OR 2.96; 95 per cent CI 1.20-7.27;  $p=0.02$ ) and worry (OR 2.87; 95 per cent CI 1.23-6.69;  $p=0.02$ ).<sup>423</sup>

Stigmatization of health care workers as potential vectors of SARS-CoV-2 transmission has additionally been described in multiple settings in the region, and may lead to mental health consequences. In Palestine, for instance, intense stigmatization of frontline health care workers has led to concerns that a disproportionate number of women may choose to remain at home.<sup>424</sup> Stigmatization was similarly explored in a cross-sectional study of 509 Egyptian physicians (69.4 per cent female), which determined that nearly one third of participants perceived stigma since the onset of the pandemic, and that stigma was associated with working in COVID-19 quarantine centre and early career stage.<sup>425</sup> Interestingly, investigators did not detect any statistically significant differences in perceived stigma among men and women, though women were identified as being more likely to be directly involved in the care of COVID-19 patients than were men (61.6 per cent of women vs. 38.4 per cent of men;  $p=0.021$ ).<sup>426</sup> Direct exposure to patients with COVID-19 has been suggested to be a potential predictor of stress and mental illness among health care workers, and may therefore be an important mechanism driving anxiety and depression among women.<sup>427</sup>

Indeed, limited resources, particularly in settings of active conflict, may be a major source of distress for health care workers. This was suggested by a cross-sectional survey of 168 female and six male obstetricians in Libya, which found that over half of those surveyed perceived greater stress as a result of the pandemic, with the majority citing lack of clinical preparedness as the main reason.<sup>428</sup> Broadly speaking, health care workers in conflict settings may experience unique stressors. For instance, a cross-sectional survey of 2,430 medical students (78.9 per cent female) attending 15 medical schools in Libya identified internal displacement ( $p<0.05$ ) and living status (alone versus with family) as independent predictors of anxiety.<sup>429</sup> Another cross-sectional study of 745 health care workers (51.9 per cent female) working across 15 hospitals in Libya which sought to determine the compounding effects of the pandemic and civil war on the mental health of health care workers identified young age, living in a conflict zone, number of weekly working hours and internal displacement as some of the predictors of a mood and/or anxiety disorder in this population, though no gender-based differences were detected.<sup>430</sup>

Another cross-sectional survey of 532 (44.7 per cent female) physicians working in diverse specialties across 20 Libyan hospitals found that living in an area of active armed conflict was associated with emotional exhaustion, as was female gender ( $p<0.05$ ).<sup>431</sup> Female gender was also significantly associated with depersonalization ( $p<0.05$ ), a psychological condition whereby one feels detached from one's own sense of identity or reality. Notably, roughly one third of study participants had been forcibly displaced by the Libyan conflict. This study went on to describe high levels of abuse among patients perpetrated by militias, which included high rates of physical abuse (reported by 21.8 per cent of men and 12.2 per cent of women;  $p=0.004$ ) and verbal abuse (57 per cent without any differences among genders).<sup>432</sup>

A mixed-methods study of frontline health care workers (physicians, nurses, and lab and radiology technicians) in the West Bank which surveyed 550 participants (55.3 per cent female) provided valuable insight into challenges experienced by female health care workers in humanitarian settings in the region, which included feelings of isolation and lack of support while remaining distant from their families due to fears of infecting them, as well as balancing personal and professional obligations with particular regard to caregiving for children and elderly relatives.<sup>433</sup>

These myriad stressors may translate into higher rates of mental illness, including depression, anxiety and insomnia, for female health care workers in the Arab states. For instance, a survey of 502 (50 per cent female) frontline health care workers from 20 hospitals in Egypt demonstrated that female clinicians were more likely than their male counterparts to report experiencing severe forms of anxiety (OR 1.85; 95 per cent CI 1.12-3.05;  $p=0.016$ ), depression (OR 2.013; 95 per cent CI 1.17-3.4;  $p=0.011$ ) and stress (OR 2.68; 95 per cent CI 1.5-4.6;  $p<0.001$ ).<sup>434</sup> Another study from Egypt of 79 (57 per cent female) ophthalmologists practicing in university hospitals in Cairo found that 82.4 per cent of participants described needing a psychological assessment ( $p=0.015$ ).<sup>435</sup> A study of 697 (54.7 per cent female) dental students in Saudi Arabia found that female gender was significantly associated with depression ( $\beta$  2.00; 95 per cent CI 1.50-2.66;  $p<0.0001$ ), anxiety ( $\beta$  2.28; 95 per cent CI 1.64-3.16;  $p<0.0001$ ), and stress ( $\beta$  1.92; 95 per cent CI 1.37-2.67;  $p<0.0001$ ).<sup>436</sup>

In Tunisia, a cross-sectional study of 191 physicians (80.9 per cent female) working in the public sector recently aimed to determine the impact of the pandemic on perceived stress and coping mechanisms and found that female physicians were more likely to score higher on stress perception scale than their male counterparts (mean score 29.65 vs. 25.53;  $p<0.001$ ).<sup>437</sup> Interestingly, while authors found that physicians with greater stress were more likely to employ healthier coping strategies, there was no association detected between gender and coping mechanism.

Similar trends have been observed among female health care workers working in Gulf countries. In Bahrain, for instance, a cross-sectional survey of 257 frontline and non-frontline health care workers (70 per cent female) examined the impact of the pandemic on sleep quality and mental health and identified female sex as the sole independent predictor of moderate-to-severe stress in this population (OR 2.0; 95 per cent CI 1.1-4.0;  $p=0.04$ ).<sup>438</sup> In a cross-sectional study of 509 doctors and nurses in Oman (80.3 per cent female), more women than men were found to have high levels of anxiety (28.3 per cent vs. 17.0 per cent;  $p=0.013$ ) and stress (58.7 per cent vs. 47.0 per cent;  $p=0.023$ ).<sup>439</sup> A cross-sectional survey of 402 female physicians (28.4 per cent) and nurses (71.6 per cent) working in different hospitals in Oman, which specifically sought to determine the impact of the pandemic on female health care workers, found that 27.9 per cent of participants had moderate-to-severe anxiety ( $p=0.02$ ), 45.3 per cent had low well-being scores ( $p<0.001$ ), and 39.3 per cent described poor sleep quality ( $p<0.001$ ), with frontline workers reporting higher rates of perceived stress ( $t(396) = 2.67$ ,  $p < 0.001$ ,  $d = 0.30$ ).<sup>440</sup>

In Saudi Arabia, a cross-sectional survey of 502 physicians, nurses, and allied health professionals (31.9 per cent female) employed in the Ministry of Health found that approximately one third of women surveyed had moderate to severe levels of anxiety (30.7 per cent) and depression (33.6 per cent).<sup>441</sup> Women were found to have higher mean scores of depressive (8.11 vs. 6.56;  $p<0.001$ ) and anxiety (7.43 vs. 5.93;  $p<0.001$ ) symptoms as compared with men, who were found to be less likely in multivariate analysis to demonstrate symptoms of generalized anxiety ( $B=-0.22$ ; 95 per cent CI -0.43 - -0.02;  $p<0.05$ ). Interestingly, nurses were also shown to have higher mean anxiety scores as compared with other health professionals, though these findings were not stratified by gender.

Another study of a non-representative sample of 1,597 adults (45 per cent female) residing in Saudi Arabia, approximately one third of whom were health care workers, determined that both female gender and being a health care worker were predictors of depression and anxiety in this population.<sup>442</sup> A cross-sectional study of 1,385 university students (71.8 per cent female), which included medical students, in geographically diverse areas of the UAE found that female students were more likely than men to report moderate-to-severe anxiety ( $p<0.0001$ ), and that anxiety among female students was highest during hospital visits (OR 2.02; 95 per cent CI 1.4-2.91).<sup>443</sup> Interestingly, anxiety levels significantly decreased for female students after switching to online learning (OR 1.85; 95 per cent CI 1.41-2.41;  $p<0.001$  vs. OR 1.72; 95 per cent CI 1.30-2.26;  $p<0.001$ ), though remained higher than men's anxiety levels, suggesting that fear of COVID-19 was driving anxiety.<sup>444</sup>

Notably, some peer-reviewed studies were unable to identify gender-based difference in pandemic-related distress among health care workers. For instance, a multi-national study of 650 dentists (75 per cent female) across 30 countries which sought to explore the mental health impact of the pandemic on practicing dentists and found no statistically significant differences between male and female respondents, though over 75 per cent of participants reported pandemic-related anxiety and fear.<sup>445</sup> In the West Bank, a cross-sectional survey of 430 frontline health care workers (54.8 per cent female), including 211 physicians (32.8 per cent female) did not identify any gender-based differences in perceived stress levels, which authors hypothesized may be due to female doctors being less likely than their male counterparts to care for patients with COVID-19, though this claim was not substantiated with evidence.<sup>446</sup> A peer-reviewed study exploring the effects of the pandemic on the prevalence of acute stress disorder and coping mechanisms among a sample of 448 Jordanian nurses (73 per cent female) working in several hospitals in Jordan similarly concluded that, though 64 per cent of nurses were experiencing acute stress disorder, gender was not a statistically significant predictor of psychological distress in this population.<sup>447</sup>

Interestingly, a cross-sectional study of 281 clinical nurses (85.8 per cent female) working at two governmental hospitals in Riyadh found that female nurses had lower mean anxiety scores than did their male counterparts, a finding that authors attribute to men's role as the primary breadwinners.<sup>448</sup> It is difficult to generalize these findings given the small sample size and overwhelming evidence cited above demonstrating a female predisposition to mental illness, both among health care workers as well as the general population.

## Domestic Workers

### Introduction

According to the International Labour Organization, there are an estimated 54 million female domestic workers worldwide, of whom 2.1 million are migrants working in the GCC countries and in the Arab states of Jordan and Lebanon.<sup>449</sup> While both the national and migrant domestic workforce in individual states are vulnerable to the pandemic, we focus here primarily on female migrant domestic workers, who may face additional non-occupational risks including selective mobility restrictions, legal barriers related to immigration, and severe social isolation.

International migration is a gendered process, influenced by the outsourcing of domestic care work, in which migrant women often find employment in the service industry, primarily through domestic work or nursing, or else in the informal sector where they are underpaid and may not have access to basic rights such as paid sick leave.<sup>450</sup> Once at their destinations, female migrant workers are more likely than men to face economic insecurities and workplace violence. Many may experience challenges in receiving sexual and reproductive health care. In fact, a recent study among service providers across 15 Arab countries found that migrant domestic workers are perceived as being particularly vulnerable to SGBV in the current pandemic due to greater economic and legal insecurities that may make them more susceptible to violence.<sup>451</sup>

Migrants may also be facing heightened risks of deportation as a consequence of the pandemic, with one report describing the deportation of thousands of undocumented Ethiopian workers from Saudi Arabia and the UAE simply for being perceived as at risk for transmitting COVID-19.<sup>452</sup> In this context, migrant workers may also be particularly vulnerable to mental illness, a risk that is now exacerbated by the pandemic and its economic effects. In Saudi Arabia, for instance, an unemployed female Indian nurse who was unable to find work, committed infanticide and suicide after her husband also lost employment and contracted COVID-19.<sup>453</sup>

Much of the literature on migrant domestic workers' health needs during the COVID-19 pandemic comes from Lebanon, where, as elsewhere in the region, migrants are commonly employed under the "Kafala" or sponsorship system, wherein their legal status in the country is often dependent upon their employer, though this has changed in some countries following advocacy campaigns. Under this system, migrants are excluded from national labour legislation and are not guaranteed basic rights.<sup>454</sup> Below, we discuss the effects of the pandemic on female migrant workers under the Kafala system, with a particular focus on those working in Lebanon.

### Sexual and Gender-Based Violence

Human Rights Watch has shed light on the heightened risk of violence faced by domestic workers in the Middle East, and in particular the UAE, Lebanon and Kuwait, where pandemic-related lockdowns are feared to exacerbate longstanding injustices, such that women may be held against their will in abusive households.<sup>455</sup> The Kafala system under which most migrant women are employed facilitates abusive cycles, as workers are unable to switch employers – or in some cases return to their country of origin – without the explicit permission of their employer.<sup>456</sup> In Lebanon, those who manage to escape abusive households are typically returned involuntarily to their employer's home, or in some cases imprisoned or deported. Social distancing measures may exacerbate the risk of abuse, as many domestic workers are prohibited from leaving the home and therefore from accessing services or seeking help in abusive household settings.<sup>457</sup> Several reports have described cases of emotional, physical, economic and sexual abuse of domestic workers during the spring 2020 lockdown in Lebanon.<sup>458</sup> Further, a staggering 42 per cent of migrant domestic workers in Lebanon who called into a health hotline between April and June 2020 reported experiencing physical and/or sexual violence; one woman described enduring rape and forced sex work.<sup>459</sup>



## *Risk of COVID-19 Exposure and Challenges to Accessing Health care*

Female migrant domestic workers often are tasked with informal caregiving responsibilities and may be responsible for caring for household members with COVID-19.<sup>460</sup> In Lebanon, migrant domestic workers' health care accessibility is normally contingent upon their individual employers as outlined in the Kafala employment contract. Given the precipitous economic decline, many migrants may not be able to access health care services precisely when they are most needed.<sup>461</sup> Those who do not live with their employers are typically undocumented and often live in crowded settings, depend upon informal and inconsistent work, and lack health insurance.<sup>462</sup> Migrant workers also have more difficulty accessing protective resources such as face masks and hand sanitizer.<sup>463</sup> Though theoretically uninsured migrants should have access to public hospitals, there have been several reports of undocumented domestic workers being refused care even when exhibiting COVID-19 symptoms.<sup>464</sup> In fact, a representative of Rafic Hariri University Hospital, a public institution caring for the largest number patients with COVID-19 in Lebanon, admitted that the facility did not provide testing or treatment for legally undocumented individuals except in cases of acute emergency.<sup>465</sup> Practically, such policies disproportionately affect the most vulnerable female migrant workers and refugees, who were denied testing and treatment even when symptomatic and directed instead to private institutions, where the cost of a diagnostic test ranged from 100 to 498 USD.<sup>466</sup>

## *Implications for Residency, Legal Status, Employment and Travel*

Migrant domestic workers in Lebanon have encountered numerous financial, psychosocial and legal challenges related to the pandemic. Firstly, many are experiencing loss of employment due to concerns about viral transmission. However, because of travel restrictions, often those newly jobless workers are unable to return to their country of origin.<sup>467</sup> In addition to the pandemic, the massive economic decline in Lebanon, and particularly the scarcity of US dollars with rapid depreciation of the currency, has had devastating effects on the roughly 250,000 migrant workers living in the country, with reports that domestic workers are being held in their employers' homes without pay as thousands of others have sought repatriation.<sup>468</sup> Migrant domestic workers who do not reside in their employers' home typically carry expired work permits and often are paid an hourly wage. Such workers have been further impacted by the compounding economic and public health crises, as the lockdown has prevented many of them from being able to travel to work.<sup>469</sup>

Many of the women who sought repatriation faced state-sanctioned retribution that included fines for violating the terms of their residency permits, and, during the several months of lockdown in which the airport remained non-operational, were not permitted to leave the country if their work permits had expired.<sup>470</sup> With the dire financial crisis, many employers have simply abandoned domestic workers in the street. This past summer, for instance, hundreds of Ethiopian women were left outside of their country's consulate, where they remained, unhoused, for weeks.<sup>471</sup> Other employers have attempted to "sell" domestic workers; in April, two disturbing posts were shared on social media of Lebanese persons seeking to obtain money in exchange for the live-in domestic worker currently employed in their home. The first of these read: "Domestic worker, African nationality (Nigerian), for sale with a new residency permit and completed legal documents. Age: 20 years, she is energetic and very clean."<sup>472</sup>

## *Mental Health*

In 2008, Human Rights Watch approximated that each week, one migrant domestic worker in Lebanon died either by suicide or accidentally while escaping her employer's home, a figure that is estimated to have now doubled in the context of the pandemic.<sup>473</sup> This urgent mental health need was corroborated by a recent report released by Médecins Sans Frontières (MSF). The organization had established an emergency hotline following the onset of the pandemic for migrant domestic workers in Lebanon that received over 400 calls from April to June 2020.<sup>474</sup> Of these, 63 callers were requesting mental health assistance, including 16 persons with symptoms of psychosis, half of whom were women requiring urgent hospitalization for psychiatric illness. Among those seeking mental health services, 94 per cent were women, approximately 35 per cent were unhoused and 12 per cent were temporarily being sheltered by a friend. The vast majority of patients presenting with psychosis were women located outside of the Ethiopian consulate, where they had been abandoned by their employers. Notably, only one of the women who sought care contacted MSF from her employer's home, suggesting that there may be many more women in need who, in confinement, are unable to reach out. In terms of clinical presentation, 27 per cent of the women seeking mental health care demonstrated psychosis, 30 per cent exhibited depressive symptoms, approximately 40 per cent reported suicidal ideation in the preceding six months, and over 50 per cent were found to have active suicidal intent diagnosed by an MSF-affiliated psychologist. The MSF team encountered a number of obstacles when referring the women to inpatient psychiatric facilities, including limited inpatient capacity, lack of insurance coupled with expensive services, delayed referrals, and fear among the women themselves of being abused while in an institution.<sup>475</sup>



# Section 8

## Conclusion

Humanitarian emergencies like the COVID-19 pandemic expose and exploit deeply entrenched societal inequities and, in doing so, paradoxically offer opportunities for reform. This was the case for the 14th century Black Plague of Europe, which catalysed major labour rights movements across the continent, and the 1918 influenza pandemic, which increased American women's labour force participation and political decision-making power.<sup>476</sup>

COVID-19, while devastating to women in the Arab region and elsewhere, similarly has called attention to gender inequities that long predate the pandemic, cultivating a global discourse on how to close the gender gap.<sup>477</sup> One example is renewed attention to intrinsically sexist legislation under Arab and Muslim family law and the cultural norms which propagate them.<sup>478</sup> Another is the gross underrepresentation of women in national and institutional COVID-19 response leadership positions. In this report, we call attention to these disparities and the gender systems which uphold them in the Arab states.

Through our novel conceptual framework, we delineate the differential vulnerability to, and far-reaching impact of the COVID-19 pandemic on women and men in the Arab region, dissecting the complex interplay of contributing sociocultural, political and economic factors. Triangulating data from multiple sources, including a scoping review of the peer-reviewed and grey literature, secondary analysis of publicly available data, and discussions with key contacts engaged in COVID-19 and gender work, we have identified the major knowledge gaps in the region and highlighted the positive, gender-inclusive responses that some institutions and governments have implemented to address the pandemic. This report is the first step to recognizing gendered health needs, risks, and outcomes in settings of overlapping crises and achieving gender equity in public health in the Arab states.

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# Section 9

## Appendix

**Table A. Peer-reviewed cross-sectional studies (N=72) that include gender analysis of knowledge, attitudes, or practices related to COVID-19**

First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<b>EGYPT (N=7)</b>				
<i>Abdel Wahed, WY; Journal of Community Health</i>	Health care workers in different hospitals	407 (49% female; N=201)	"To assess knowledge, sources of information, perceptions, and attitudes of Egyptian health care workers towards COVID-19."	<ul style="list-style-type: none"> <li>Female sex was a predictor of fearing COVID-19 infection (OR 1.969; 95% CI 1.004-3.860).</li> <li>Study did not stratify individual HCW types by gender, nor did it stratify direct patient contact (47.7% in overall sample) by gender.</li> </ul>
<i>Abdelhafiz, SA; Journal of Community Health</i>	Egyptian adults who do not work in health care	559 (62.3% female; N=348)	"To assess the knowledge, attitudes, and perceptions about COVID-19 among a sample of the general public in Egypt."	<ul style="list-style-type: none"> <li>There were no statistically significant differences in COVID-19 knowledge among men and women.</li> <li>Illiterate individuals were less likely to report adherence with preventative practices (<math>p&lt;0.001</math>) and seek medical attention for COVID-19 symptoms (<math>p&lt;0.001</math>) though these results not stratified by gender.</li> </ul>
<i>Bakry, H; Journal of Infection in Developing Countries</i>	Egyptian adults	1,036 (63.7% female)	"To assess perceptions of Egyptians regarding social distancing to prevent COVID-19"	Men were more likely to report good adherence to social distancing (24.5% vs. 14.5%) and less likely to report poor adherence to social distancing (75.5% v. 85.5%) ( $p<0.001$ ).
<i>Elgendy, M; Patient Education and Counseling</i>	Egyptian adults	726 (72.3%; N=525)	"To evaluate public awareness in Egypt related to COVID-19"	There were no differences in COVID-19 knowledge observed between men and women.
<i>Hamza, M; Journal of Community Health</i>	Pharmacy students in Egypt	238 (70% female)	"To assess pharmacy students' knowledge, attitudes, and practices towards the COVID-19 pandemic"	<ul style="list-style-type: none"> <li>Women were 3.6 times more likely than men to avoid leaving their homes (95% CI 1.03-3.11; <math>p&lt;0.05</math>).</li> <li>Women were 3.6 times more likely to avoid crowded places (95% CI 1.5-8.6; <math>p&lt;0.05</math>) and 2.3 times more likely to maintain social distancing of 2 meters from others (95% CI 1.2-4.4; <math>p&lt;0.05</math>).</li> </ul>
<i>Kasemy, Z; Journal of Epidemiology and Global Health</i>	Egyptian adolescents and adults	3,712 (52.2% female)	"To assess knowledge, attitude, and practices towards COVID-19 among Egyptians"	Females had higher knowledge (21.27 vs. 20.83; $p<0.001$ ) and greater reported adherence to prevention measures (13.05 vs. 12.98; $p=0.041$ ) than did men, but less favorable attitude (10.64 vs. 10.9; $p<0.001$ ).
<i>Soltan, E; Comprehensive Clinical Medicine</i>	Undergraduate medical students at Suez Canal University	283 (61.1% female; N=173)	"To evaluate knowledge, risk perception, and preventative behaviours related to the COVID-19 pandemic among undergraduate medical students in Egypt"	Female students had higher knowledge and behaviour scores as compared with men ( $p<0.001$ ).

First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<b>IRAQ (N=4)</b>				
<i>Abdulah, DM; Disaster Medicine &amp; Public Health Preparedness</i>	Adults living in Duhok governorate	1,343 (45.4%; N=610)	"To determine public perceptions and adherence to SARS-COV-2 prevention principles"	There were no statistically significant differences between genders regarding fear level of contracting COVID-19
<i>Alatrany, SJ; International Journal of Psychosocial Rehabilitation</i>	Adults residing in Iraq	753 (40% female; N=301)	"To explore stigma among general Iraqi public toward people with Iraq"	There were no significant differences detected between male and female respondents on COVID-19-related stigma.
<i>Hussein, N; Journal of Family Medicine &amp; Primary Care</i>	University students in Kurdistan region of Iraq	1,959 (55% female)	"To assess knowledge, attitude, and practices towards COVID-19 among university students in the Kurdistan region of Iraq"	<ul style="list-style-type: none"> <li>Women had statistically significant higher knowledge scores than did men (9.2 vs. 8.9; <math>p &lt; 0.001</math>).</li> <li>Women were more likely to have favorable attitudes regarding the future of the pandemic (<math>p &lt; 0.001</math>).</li> <li>Women were less likely than men to report visiting crowded areas (11.1% vs. 3.6%; <math>p &lt; 0.001</math>) and more likely to report wearing a mask (45.6% vs. 66.9%; <math>p &lt; 0.001</math>).</li> </ul>
<i>Kamel, R; Revista de Salud Publica</i>	Iraqi general public	1,153 (52% female; N=599)	"To determine the extent of adherence with prevention measures among Iraqi public"	As compared with men, women were more likely to report adhering to personal preventative measures ( $p = 0.013$ ).
<b>JORDAN</b>				
<i>Abdel Jalil, M; Disaster Medicine &amp; Public Health Preparedness</i>	Pharmacists	449 (18.3% female; N=82)	"To determine the COVID-19 knowledge, public health activities, opinions, and sources of information among Jordanian pharmacists"	<ul style="list-style-type: none"> <li>No gender-based differences in COVID knowledge among respondents.</li> <li>Despite the fact that women constitute 64.4% of registered pharmacists in Jordan, they represent only 18% of study participants.</li> </ul>
<i>Abu-Farha, RK; Patient preference &amp; adherence</i>	Adults living in Jordan	1,287 (57% female; N=734)	"To examine willingness to participate in COVID-19 vaccine trial"	<ul style="list-style-type: none"> <li>In simple logistic regression, men were more likely than women to express willingness to participate in a COVID-19 vaccine clinical trial (OR 1.354; <math>p = 0.011</math>) but this relationship was not observed in multiple regression models.</li> <li>Overall, only 36% of the sample reported willingness to participate in a trial. Barriers were fear (40.7%), not wanting to be challenged by the virus (68%), lack of time (40.4%), and mistrust in pharmaceutical companies (38.9%).</li> </ul>
<i>Al-Ahmad, H; International journal of clinical practice</i>	Jordanian general public	578 (47.1% female; N=271)	"To explore public perceptions about pharmacists' educational and prescribing role during the COVID-19 pandemic"	Women were found to have "lower perception scores" toward medication delivery services during the pandemic ( $p = 0.008$ ).
<i>Basheti, I; Research In Social &amp; Administrative Pharmacy</i>	Pharmacists and pharmacy students	726 (71.9% female; N=522)	"To investigate pharmacists and pharmacy students' awareness and sources of their information regarding managing of COVID and their perspective of their role during the emergency"	There were no gender-based differences observed regarding COVID-19 knowledge.

First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<i>Dardas, LA; The Journal of School Nursing</i>	Jordanian adolescents	1,054 (71% female)	"To explore the knowledge, attitudes, and practices toward COVID-19 and their correlates among Jordanian adolescents"	There were no significant gender differences observed in knowledge or attitude scales, but females found to be more likely to report adhering to recommended practices than males ( $t(1,052) = 4.2, p < .001$ ).
<i>Elayeh, Eman; PLoS ONE</i>	Jordanian adults	2,104 (75.4% female; N=1,586)	"To determine the knowledge, attitude, and practices of Jordanians towards COVID-19"	<ul style="list-style-type: none"> <li>Women had higher knowledge scores towards COVID-19 and prevention (16.1 vs. 15.8; <math>p=0.003</math>),</li> <li>There were no statistically significant difference observed in practice scores between men and women. Women surveyed after the first case was reported in Jordan had higher practice scores than women surveyed prior to the first case reported (4.2 vs. 3.7; <math>p&lt;0.005</math>).</li> <li>Working in the medical field was also associated with higher COVID-19 knowledge scores.</li> </ul>
<i>Jarab, A; International Journal of Clinical Practice</i>	Pharmacy students in Jordan	860 (67.8% female)	"To evaluate pharmacy and PharmD students' knowledge and information needs about COVID-19"	There were no statistically significant gender-based differences observed in COVID-19 knowledge.
<i>Khabour, Omar; Journal of Multi-disciplinary Health care</i>	Jordanian adults	1,863 (69% female)	"To assess perceptions of COVID-19 and its relationship to seasonal influenza among Jordanians"	<ul style="list-style-type: none"> <li>56.9% of women compared with 50.3% of men thought that COVID-19 was a naturally occurring virus (<math>p=0.002</math>). Women were also less likely to disagree with the statement that COVID-19 was engineered in a lab (17.7% of women vs. 24.7% of men; <math>p=0.011</math>).</li> <li>Women were more likely to believe that children (54% vs 50.4%; <math>p=0.001</math>) and pregnant women (72.7% vs. 67.7%; <math>p=0.004</math>) were susceptible to the virus.</li> <li>More women than men agreed with the statement that some COVID-19 patients develop severe symptoms (84.4% vs. 78.8%; <math>p=0.038</math>).</li> </ul>
<i>Olaimat, A; American Journal of Hygiene &amp; Tropical Medicine</i>	University students	2,083 (75.5% female; N=1,572)	"To assess the attitudes, anxiety, and behavioral practices of university students regarding the COVID-19 pandemic"	Women were more likely to engage in "low-risk behavioral practices" (69.9% vs. 60.7%) and less likely to engage in high-risk behavior (4.6% vs. 9.2%) ( $p<0.001$ ) than were men.
<i>Olaimat, A; Frontiers in Public Health</i>	University students	2,083 (75.5% female; N=1,572)	"To assess student knowledge regarding COVID-19 and determine sources of information"	<ul style="list-style-type: none"> <li>There were no statistically significant differences in COVID-19 knowledge observed between men and women.</li> <li>Men were more likely than women to report using internet and social media (81.8% vs. 75.5% <math>p=0.003</math>) and scientific websites and articles (30.7% vs. 22.1% <math>p &lt; 0.001</math>) as sources of COVID-19 information.</li> </ul>
<i>Sallam, M; International Journal of Environmental Research &amp; Public Health</i>	University students	1,540 (74.4% female; N=1,145)	"To evaluate the mutual effects of belief that the pandemic was the result of a conspiracy on knowledge and anxiety levels among students at the University of Jordan"	<ul style="list-style-type: none"> <li>Men were more likely to report that COVID-19 is "very dangerous" as compared with women (38.6% vs. 24.1% <math>p &lt; 0.001</math>).</li> <li>Women were more likely to report adherence to quarantine measures than were men (3.3% vs. 1.2% <math>p=0.007</math>) and were also more likely to believe that the pandemic was a part of a conspiracy (36.3% vs. 23.8% <math>p=0.001</math>).</li> </ul>

First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<i>Sallam, M; PLoS ONE</i>	Adults living in Jordan	3,150 (76.0% female; N=2,358)	"To evaluate the knowledge, attitudes, and effects of COVID-19 misinformation on anxiety levels in the general Jordanian population"	<ul style="list-style-type: none"> <li>Women were more likely to believe that COVID-19 was part of a "global conspiracy" (50.1% vs. 41.2%, <math>p&lt;0.001</math>; <math>\chi^2</math>) and "biological warfare" (59.7% vs. 48.6%, <math>p&lt;0.001</math>; <math>\chi^2</math>), and spread through "5g networks" (23.6% vs. 12.8% in males, <math>p&lt;0.001</math>; <math>\chi^2</math>) than were men</li> <li>Men were more likely than women to perceive of COVID-19 as "very dangerous" (41.2% vs. 35.2%, <math>p = 0.001</math>; <math>\chi^2</math>).</li> </ul>
<i>Suleiman, A; International Journal of Environmental Research &amp; Public Health</i>	Doctors working in multiple health care settings	308 (36.7% female; N=113)	"To evaluate preparedness of frontline doctors to COVID-19"	Men had higher preparedness scores as compared to women (5.2 vs. 4.5 $p=0.019$ ).
<b>LEBANON (N=3)</b>				
<i>Domati, S; Frontiers in Medicine</i>	Children and adults living in geographically diverse areas of Lebanon	510 (58% female; N=238)	"To determine knowledge of COVID-19 among Lebanese public"	There were no gender-based differences observed regarding COVID-19 knowledge
<i>Melki, J; Health communication</i>	Lebanese adults	792 (43.9% female; N=346)	"To examine whether increased media exposure to COVID-19 news and interpersonal communication about the disease positively relate to people's abidance by prevention measures, and whether perceived knowledge and fear mediate this relationship"	<ul style="list-style-type: none"> <li>There were no differences between men and women in reported TV and social media exposure; the majority of the sample reported high TV and social media exposure.</li> <li>Among women, high TV and social media exposure were associated with perceived higher knowledge scores (<math>p=0.01</math>) and higher fear (<math>p=0.034</math>).</li> <li>In linear regression analysis, women's preventative practices were all more likely to be affected by media exposure and mediated by perceived knowledge and fear.</li> </ul>
<i>Nasser, Z; BMC Oral Health</i>	Dentists in Lebanon	358 (45.8% female)	"To assess the knowledge and practice of dentists toward the COVID-19 epidemic in Lebanon"	<ul style="list-style-type: none"> <li>There were no statistically significant differences observed between female and male dentists.</li> <li>The majority had good knowledge and 58.7% reported good practices.</li> </ul>
<b>SAUDI ARABIA (N=35)</b>				
<i>Abolfotouh, M; BMC Infectious Diseases</i>	Health care workers in three tertiary care hospitals in Saudi Arabia	844 (61.4% female; N=518)	"To assess perceptions and attitudes of HCWs in Saudi Arabia re: COVID-19"	There were no gender-based differences observed between men and women regarding degree of concern about COVID-19
<i>Al Ahdal, H; Journal of Infection and Public Health</i>	Adults living in Riyadh, Saudi Arabia	1,767 (75% female; N=1,339)	"To explore the awareness, attitude, and practice of prevention toward/ regarding COVID-19 among adults living in Riyadh, Saudi Arabia"	<ul style="list-style-type: none"> <li>Men were more likely to be "aware" of COVID-19 transmission/prevention (knowledge score 13.22 vs. 12.72 <math>p=0.002</math>).</li> <li>Women were more likely to report adherence to activity (practice score 9.04 vs. 8.87; <math>p=0.003</math>).</li> </ul>
<i>Al-Balawi, H; African journal of ophthalmology</i>	Ophthalmologists and ophthalmologists in training in Saudi Arabia	120 (32.5% female)	"To evaluate ophthalmologists' knowledge, attitude, and practices toward the outbreak"	There were no statistically significant gender-based differences observed in knowledge, attitude, or practices towards COVID-19.

First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<i>Al-Baqawi, HM; Frontiers in Public Health</i>	Student nurses at seven universities	1,226 (71.6% female; N=878)	"To assess knowledge, perceptions, and preventive behavior toward COVID-19 among student nurses in Saudi Arabia"	<ul style="list-style-type: none"> <li>Women had statistically (but perhaps not clinically) significant scores related to COVID-19 knowledge than men (9.94 vs. 9.62; <math>p &lt; 0.01</math>)</li> <li>Women also reported greater adherence to preventive behavior than men (mean score 18.96 vs. 17.55; <math>p &lt; 0.05</math>)</li> <li>University, age, academic level, and perceived knowledge level were all additionally correlated with higher COVID-19 knowledge.</li> </ul>
<i>Al-Darhami, A; International journal of general medicine</i>	Adults living in Saudi Arabia	5,105 (58.4% female; N=2,980)	"To evaluate the awareness and adherence of Saudi population to COVID-19 prevention measures"	<ul style="list-style-type: none"> <li>Females were more likely than males to report social distancing in multiple logistic regression analysis (OR 1.779; <math>p &lt; 0.001</math>) and had higher prevention practice scores than did men (<math>\beta</math> 0.969, <math>p &lt; 0.001</math>)</li> <li>Other predictors of awareness were higher education levels, higher income, and living in the middle region of the country.</li> </ul>
<i>Al-Dossary, ; International Journal of Environmental Research and Public Health</i>	Nurses in governmental and private hospitals in five regions of Saudi Arabia	500 (85% female; N=431)	"To examine predictors of COVID-19 awareness, attitudes, prevention, and perceptions among nurses in Saudi Arabia"	Women had statistically higher prevention (4.33 vs. 3.95) scores than did men ( $p=0.02$ ) but no differences observed in perceptions, attitudes, or knowledge.
<i>Al-Drees, T; Frontiers in Public Health</i>	Medical students attending three universities in Saudi Arabia	494 (35.4% female; N=175)	"To evaluate knowledge of symptoms, treatment, and PPE among medical students in Saudi Arabia"	<ul style="list-style-type: none"> <li>Women had higher knowledge on use of PPE than did male students (<math>p=0.02</math>)</li> <li>No statistically significant differences between men and women related to knowledge of symptoms, anosmia, and treatment.</li> <li>Students using medical databases or published research had better knowledge of COVID-19 symptoms than those using social media.</li> </ul>
<i>Al-Duraywish, A; International Journal of Environmental Research and Public Health</i>	Health care workers	1,040 (67.4%; N=701)	"To assess the knowledge and attitudes of health care workers towards COVID-19"	Women were more likely than men to have poor COVID-19 knowledge (OR 1.88; 95% CI 1.44-.44)
<i>Al-Hanawi, M; Frontiers in Public Health</i>	Adults living in geographically diverse regions of Saudi Arabia	3,388 (58.03% female; N=1,966)	"To investigate the knowledge, attitudes, and practices of the Saudi public towards COVID-19 during the pandemic"	<ul style="list-style-type: none"> <li>Female sex was a significant predictor of participant knowledge on COVID-19.</li> <li>Compared to women, men have lower knowledge (<math>B=-0.018</math>; <math>p &lt; 0.001</math>), lower positive attitudes (<math>B=-0.0018</math>; <math>p &lt; 0.001</math>), and fewer good practices for COVID-19 (<math>B=-0.0064</math>; <math>p &lt; 0.001</math>).</li> <li>Findings are consistent with prior studies done in the context of the MERS epidemic, particularly with regard to preventative practices.</li> <li>Authors conclude that public health messaging should be targeted to men or to women who live with men, in order to achieve changes in men's behavioral practices.</li> </ul>
<i>Al-Hazmi, A; Journal of Public Health Research</i>	Saudi adults	1,513 (55% female; N=833)	"To assess knowledge, attitudes and practices of public residents toward COVID-19 prevention measures in Saudi Arabia"	Men had higher mean scores than women on knowledge scales (82.4 vs. 80.5; $p < 0.05$ ); no statistically significant differences in attitude or practice.
<i>Al-Jasser, R; Journal of Multidisciplinary Health care</i>	Undergraduate and graduate dental students studying in a university	412 (49.1% female; N=202)	"To determine level of awareness of COVID-19 among dental students"	Women had higher mean scores related to adherence than did men, though both were overall considered low (0.83 vs. 0.71; $p < 0.02$ )



First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<i>Al-Khalifa, K; PLoS ONE</i>	Dentists practicing in Saudi Arabia	287 (44.3% female; N=127)	"To assess the preparedness and perception of infection control measures against the COVID pandemic among dentists in Saudi Arabia"	<ul style="list-style-type: none"> <li>Women were found to be more likely to believe that N95 masks should be routinely worn in dental practice as a new precaution (<math>p=0.045</math>).</li> <li>There were no other statistically significant differences by gender related to knowledge, practice, or attitudes towards the pandemic.</li> </ul>
<i>Al-Malki, M; Acta Informatica Medica</i>	COVID-19 chatbot users	166 (47.6% female; N=79)	"To explore end-users' perceived utilities of health chatbots in Saudi Arabia"	There were no significant differences between men and women in seeking COVID-19 health information.
<i>Almofada, S; Cureus</i>	Adults living in geographically diverse regions of Saudi Arabia	6,000 (40.1% female; N=2,405)	"To determine knowledge, attitudes, and practices related to COVID-19 within the Saudi population"	<ul style="list-style-type: none"> <li>More men than women were aware that SARS-CoV-2 is transmissible through contact with a sick person (60.1% vs. 39.9% <math>p&lt;0.001</math>) or handshake (60.5% vs. 39.5% <math>p&lt;0.001</math>).</li> <li>Fewer women recognized social distancing (61.3% of men vs. 38.7% of women <math>p&lt;0.001</math>), mask-wearing (63.9% vs. 36.1% <math>p&lt;0.001</math>), and sanitizer use (61.9% vs. 38.1% <math>p&lt;0.001</math>) were effective preventive measures.</li> <li>Men were more likely to be aware of asymptomatic carriers of SARS-CoV-2 (61.2% versus 38.8%).</li> <li>Women exhibited lower knowledge of COVID-19 susceptibility than men (<math>p&lt;0.001</math>).</li> </ul>
<i>Almutairi, A; Risk Management &amp; Health care Policy</i>	Adults living in geographically diverse regions of Saudi Arabia	1,232 (46.8% female; N=577)	"To evaluate public trust and compliance with precautionary measures implemented by authorities to combat COVID-19 outbreak"	<ul style="list-style-type: none"> <li>Women reported being slightly more agreeable with government's actions (98+/-4.7 vs. 97.1+/- 6.2) (<math>t=2.7</math>; <math>p=0.006</math>).</li> <li>53.6% of women versus 40.6% of men were more likely to report adhering to good practices (OR 1.782 95% CI 1.4-2.7 <math>p&lt;0.001</math>).</li> <li>Authors hypothesized that the gender difference could potentially be related to cultural norms by which men are more likely to socialize with others and, prior to the suspension of public prayers, required to attend mosque.</li> </ul>
<i>Al-Nasser, AH; Infezioni in Medicina</i>	People older than 15 living in Saudi Arabia	3,204 (51.6% female; N=1,654)	"To assess the use of social media as a source for COVID-19 awareness in Saudi Arabia."	There were no statistically significant differences between men and women regarding COVID-19 awareness.
<i>Al-Otaibi, N; Journal of community health</i>	Adults in Saudi Arabia	1,515 (73.4% female; N=1,112)	"To estimate knowledge and adherence to social distancing in Saudi Arabia during Ramadan"	Women were more likely to report staying home ( $p<0.001$ ), maintaining a safe distance from others ( $p<0.001$ ), refraining from physical contact from others ( $p=0.002$ ), and not attending gatherings outside of the home ( $p<0.001$ ).
<i>Al-Rasheedi, M; Saudi Journal of Biological Sciences</i>	Health care workers and adults living in the Qassim region of KSA	130 (41.5% female; N=54)	"To analyze and evaluate the awareness of the general public and health care providers regarding COVID-19 transmission and prevention"	As compared with men, women were more likely to recognize COVID-19 treatment ( $p=0.019$ ). There were no other gender-based differences in COVID-19 knowledge or sources of information.
<i>Al-Reshidi, NM; Journal of Public Health Research</i>	Hospital-based health care workers in public and private hospitals	1,004 (78.8% female; N=791)	"To describe health care workers' knowledge, emotions, and perceptions of preparedness of their institutions towards COVID-19"	Women were more likely to have better knowledge about the COVID-19 pandemic (OR 2.50; 95% CI 1.48-4.25; $p<0.001$ ).

First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<i>Al Saif, H; International Journal of General Medicine</i>	Final year medical students at a university in Saudi Arabia	134 (29.1% female; N=39)	"To explore the willingness of medical students to work during the pandemic and determine their perceived competence"	<ul style="list-style-type: none"> <li>Male students had higher perceived competence than did women (59.85 vs. 54.72; <math>p=0.023</math>).</li> <li>There were no gender-based differences in willingness to work.</li> </ul>
<i>Alshammary, F; Current Pharmaceutical Design</i>	Adults living in geographically diverse regions of Saudi Arabia	627 (45.3% female; N=284)	"To investigate the existing knowledge of COVID-19 among men and women and the use of such knowledge to combat COVID-19"	<ul style="list-style-type: none"> <li>As compared with men, women have greater knowledge of COVID-19 and are more likely to report adherence to preventative methods, though many of these indicators did not reach statistical significance.</li> <li>As compared with men, women were found to be more likely to report practicing appropriate hand hygiene (86% vs. 80% <math>p&lt;0.05</math>), washing hands correctly for 20 seconds (81.3% vs. 78.1% <math>p&lt;0.05</math>), sneezing or coughing into their elbows (79% vs. 71% <math>p&lt;0.05</math>), and socially distancing by staying at home (83.2% vs. 81.5% <math>p&lt;0.05</math>).</li> </ul>
<i>Alyami, H; Saudi Pharmaceutical Journal</i>	Adults in Saudi Arabia	5,258 (57.1% female; N=3,000)	"To describe the knowledge of the Saudi general population on COVID-19 preventive measures and their belief about consumption of herbal products to prevent COVID-19"	Women had higher mean COVID-19 knowledge scores than did men (5.7 vs. 5.4; $p<0.001$ ).
<i>Baig, M; PLoS ONE</i>	Adults in Saudi Arabia	2,006 (47.5% female; N=953)	"To explore the predictors, misconceptions, knowledge, attitudes and practices toward the COVID-19 pandemic among a sample of the Saudi population"	<ul style="list-style-type: none"> <li>There were no statistically significant differences observed in knowledge scores between genders.</li> <li>The study identified a common misconception among 56.2% of the sample that women are more vulnerable to develop the infection than men.</li> <li>Women had more positive attitude toward COVID-19 (94.7% vs. 91.5% <math>p=0.004</math>), better reported adherence to preventive measures (99.5% vs. 96.1% <math>p&lt;0.001</math>), and fewer misconceptions (29.5% vs. 38.4% <math>p&lt;0.001</math>).</li> </ul>
<i>Bazaid, A; PLoS ONE</i>	Adults in Saudi Arabia	5,105 (58.4% female; N=2,980)	"To investigate knowledge and adherence of Saudi population to preventive measures during the COVID-19 pandemic"	<ul style="list-style-type: none"> <li>Females were more likely to identify correct hand-washing techniques than males (OR 2.835 <math>p&lt;0.001</math>).</li> <li>Women were found in multiple linear regression analysis to be more likely to adhere with preventive practices (<math>\beta</math> 0.374 95%; CI 0.321 – 0.428; <math>p&lt;0.001</math>).</li> </ul>
<i>Kaliyadan, F; Cureus</i>	Physicians in Saudi Arabia	392	"To evaluate the attitudes and behaviors of licensed physicians to telemedicine"	While the majority of respondents felt that telemedicine was useful in preventing unnecessary visits and exposures and a valuable tool for monitoring chronic patients remotely, 53% felt that cultural norms were a potential limitation, with patients and particularly women being uncomfortable with video consultations or sharing images.
<i>Khaled, A; Risk Management and Health care Policy</i>	Adults in the Aseer region of Saudi Arabia	740 (88.5% female)	"To evaluate the knowledge, attitudes, and preventive practices of people from the Aseer region of Saudi Arabia towards the COVID-19 pandemic"	Women were more likely to report wearing a mask outside (60.5% vs. 38.8%; $p=0.001$ ) and wearing protective gloves (75.9% vs. 36.5%; $p=0.001$ ), and less likely to attend social events (98.8 vs. 87.1%; $p=0.001$ ) or shopping for groceries in person (72.7% vs. 41.2%; $p=0.001$ ).



First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<i>Mansuri, F; Journal of Taibah University Medical Sciences</i>	Adults living in diverse regions of Saudi Arabia	388 (60.3% female)	"To understand public awareness of COVID-19 and estimate responses for mitigation strategies"	Female gender was associated with better response to mitigation measures but this finding was not statistically significant.
<i>Mohsin, SF; Post-graduate Medical Journal</i>	Health sciences students living in central Saudi Arabia	612 (33.7% female; N=206)	"To evaluate knowledge of health sciences students on COVID-19 within central region of Saudi Arabia"	There was no statistically significant association detected between gender and COVID-19 knowledge.
<i>Qadah, T; Journal of Infection in Developing Countries</i>	Health care workers (doctors, nurses, pharmacists, allied health professionals and administrative staff working in clinical settings) in Jeddah	1,023 (44.38% female; N=454)	"To assess the knowledge and attitudes of health care workers towards COVID-19"	<ul style="list-style-type: none"> <li>There were no statistically significant differences observed in attitude scores..</li> <li>Women had slightly lower mean knowledge scores than men (21.562 vs. 21.209); this was statistically significant (<math>p=0.006</math>) but unclear if this difference carries any practical significance.</li> </ul>
<i>Shahin, S; BMC Oral Health</i>	Dental students, dental auxiliary personnel, and dentists	1,033 (53.5% female; N=542)	"To assess the knowledge of dental professionals in Saudi Arabia regarding SARS-CoV-2 and COVID-19"	There were no statistically significant gender-based differences detected in willingness to treat COVID-19 patients; Overall, 71.5% of the sample reported reluctance to treat a patient with COVID-19.
<i>Shubayr, M; Journal of Multidisciplinary Health care</i>	Dental health care workers in Saudi Arabia	324 (24.7% female; N=80)	"To evaluate the usefulness of the extended theory of planned behavior in predicting COVID-19 infection prevention and control among a sample of dental workers in Saudi Arabia"	<ul style="list-style-type: none"> <li>There were no gender-based differences in associations of theory of planned behavior.</li> <li>Only 28.4% of the sample reported having participated in infection control activities but this was not analyzed by gender.</li> <li>The constructs of attitude towards behavior (<math>p&lt;0.001</math>) and subjective norms (<math>p&lt;0.001</math>) predicted dental workers' intention to practice infection control measures.</li> </ul>
<i>Siddiqui, A; Work (Reading, Mass.)</i>	Adults living in five regions in Saudi Arabia	443 (46.3% female)	"To examine the COVID-19 knowledge among adults in Saudi Arabia and impact of knowledge on behavior"	There were only significant differences between men and women regarding knowledge of how to seek emergency medical care and need for quarantine post-travel. However, authors only provide significance value but do not provide any details regarding the actual difference.
<i>Srivastava, KC; Journal of International Medical Research</i>	Dental health care professionals	318 (34% female; N=108)	"To assess the knowledge, attitudes, and practices of COVID-19 among dental health care professionals in Saudi Arabia"	There were no statistically significant differences in knowledge, attitudes, or practices among men and women.
<i>Temash, MH; Epidemiology &amp; Infection</i>	Health care workers at a tertiary care hospital	582 (75% female)	"To assess the knowledge, attitudes, and practices of health care workers during the COVID-19 pandemic"	<ul style="list-style-type: none"> <li>There were no differences detected between men and women regarding COVID-19 knowledge.</li> <li>Female health care workers had higher mean hygienic practices scores (2.98 vs. 2.36; <math>p&lt;0.001</math>), greater perceived adequacy of COVID-19 information (mean score 3.88 vs. 3.58; <math>p=0.002</math>), and better mean attitude scores towards COVID-19 (4.15 vs. 3.85; <math>p=0.003</math>) than did men.</li> <li>One explanation for these findings is that women were more likely than men to attend educational conferences in this cohort.</li> </ul>
<i>Tripathi, R; Frontiers in Public Health</i>	Health care workers and general public living in southwest KSA	1,000 (53.9% female; N=539)	"To assess the level of awareness and preparedness related to COVID-19 among HCWs in Saudi Arabia"	There were no statistically significant differences detected among men and women in COVID-19 knowledge levels.

First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<b>SOMALIA (N=1)</b>				
<b>Ahmed, M; Pathogens</b>	Adults living in geographically diverse areas of Somalia	Two surveys: 4,124 (39.5% female; N=1,626)  4,703 (40.9% female; N=1,916)	“To assess how well Somali residents adhere to COVID-19 preventive strategies currently recommended by the government and determine the impact of such adherence on the disease burden”	<ul style="list-style-type: none"> <li>Female gender was associated with greater odds of adhering to prevention (OR 1.718; 95% CI 1.581-1.861; <math>p &lt; 0.001</math>).</li> <li>Men reported a statistically significant greater difficulty staying home in first survey.</li> <li>In both surveys, women were more likely to report wearing a face mask (<math>p &lt; 0.001</math>), social distancing (<math>p &lt; 0.001</math>), hand-washing (<math>p &lt; 0.0001</math>), hand sanitizing (<math>p &lt; 0.001</math>), maintaining cough hygiene (<math>p &lt; 0.001</math>), and remaining at home if symptomatic (<math>p &lt; 0.001</math>).</li> <li>Women were also less likely than men to report visiting a restaurant (<math>p &lt; 0.001</math>) or market (<math>p &lt; 0.001</math>), or traveling (<math>p &lt; 0.001</math>) in the past seven days.</li> <li>Authors hypothesize that their findings are reflective of cultural norms, in which men work outside of the home and are therefore unable to practice social distancing. Interestingly, no gender-based differences were observed in reported COVID-19 symptoms.</li> </ul>
<b>SUDAN (N=2)</b>				
<b>Hezima, A; Eastern Mediterranean Health Journal</b>	Sudanese adults	812 (45.8% female)	“To assess the knowledge, attitudes, and practices of a sample of Sudanese residents towards COVID-19”	<ul style="list-style-type: none"> <li>Women were more favorable towards canceling religious gatherings and events than were men (<math>P &lt; 0.001</math>)</li> <li>Female gender was found to be significantly associated with wearing masks (<math>p &lt; 0.002</math>), avoiding crowded places (<math>p &lt; 0.001</math>), and avoiding handshaking (<math>p &lt; 0.001</math>)</li> <li>Study authors hypothesized women’s “innate fear” for their loved ones as a driving factor for this reported behavior.</li> <li>Women demonstrated statistically significantly higher knowledge scores than men (mean score 7.2 vs 6.9 <math>p = 0.001</math>).</li> </ul>
<b>Sayedahmed, AM; Scienceafrique</b>	Sudanese adults	1,718 (62% female; N=1,066)	“To assess the knowledge, attitudes, and practices of the Sudanese population towards COVID-19”	<ul style="list-style-type: none"> <li>Men were less likely than women to report good prevention practices (aOR 0.620; 95% CI 0.502-0.766).</li> <li>There were no statistically significant gender-based differences observed in multivariate analysis regarding COVID-19 knowledge or attitudes</li> </ul>

First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<b>SYRIA (N=2)</b>				
<i>Al Ahdab, S; Under consideration at BMC Public Health</i>	Syrian internet users ages 16 and above	706 (62.9% female)	"To assess knowledge, attitudes, and practices towards COVID-19 among the Syrian population"	<ul style="list-style-type: none"> <li>■ No gender-based differences in COVID-19 knowledge were identified.</li> <li>■ In multiple regression analysis, women were found to have "lower attitude" scores than did men (<math>p&lt;0.05</math>), but were more likely to report adhering to preventative practices such as hand-washing (<math>p&lt;0.01</math>).</li> </ul>
<i>Douedari, Y; J Migr Health</i>	Displaced Syrians living in opposition-controlled camps in Northwest Syria	20 (13 women)	"To explore community perspectives on challenges and potential solutions to reduce COVID-19 transmission among displaced communities in opposition-controlled northwest Syria"	<ul style="list-style-type: none"> <li>■ Men had more accurate and comprehensive COVID-19 information, which the authors attributed to awareness campaigns being preferentially directed towards men and gender roles in Syria.</li> <li>■ Authors noted a marked disparity in information accuracy, with women being less aware than men about COVID-19 transmission, prevention, and high-risk groups.</li> </ul>
<b>UAE (N=1)</b>				
<i>Vally, Z; Public Health</i>	Students, staff and faculty at universities in Abu Dhabi, Al Ain, and Dubai	634 (82.4% female; N=516)	To determine public perceptions of the pandemic, assess the extent to which people have adhered to preventive behaviors, and whether anxiety about COVID-19 or perceptions related to the pandemic are associated with greater adherence"	There were no statistically significant differences in behavioral practices detected by gender.
<b>YEMEN (N=2)</b>				
<i>Al-Ashwal, F; PLoS ONE</i>	Health care workers in Yemen	514 (55.3% female; N=284)	"To evaluate the knowledge, preparedness, counselling practices of health care workers regarding COVID-19, and perceived barriers to prevent and control COVID-19 in Yemen"	<ul style="list-style-type: none"> <li>■ Men had higher preparedness scores than women (<math>p&lt;0.001</math>); no significant differences in knowledge or practice scores between genders. Differences in preparedness are likely related to self-reporting bias as female health care workers may be less confident than men and more likely to underestimate their skills and abilities</li> <li>■ Participants perceived lack of awareness among general public as greatest barrier to achieving control of COVID-19 in Yemen (89%).</li> <li>■ No breakdown of occupation by gender</li> </ul>
<i>Al-Rubajee, Gamil; BMC Public Health</i>	Yemeni health care workers	1,231 (38.4% female; N=473)	"To explore the knowledge, attitude, anxiety, and preventive behaviors among Yemeni health care workers towards COVID-19"	<ul style="list-style-type: none"> <li>■ Women reported higher adherence to preventative behaviors than men (<math>p=0.01</math>)</li> <li>■ Women were more likely to report pandemic-related anxiety than men (<math>p=0.014</math>).</li> </ul>

First Author, Journal	Population	Sample Size	Objective(s)	Gendered Results
<b>MULTI-COUNTRY (N=2)</b>				
<i>Bonyan, R; Journal of Pharmaceutical Policy &amp; Practice</i>	Adults living in Egypt, Jordan, Palestine, Qatar, Saudi Arabia, and United Arab Emirates	485 (80.8% female; N=392)	"To evaluate and determine the factors that may affect level of awareness and responses toward COVID-19 in Arab countries"	No gender-based differences were observed in COVID-19 knowledge or awareness among participants
<i>Hager, E; PLoS ONE</i>	Adults living in Egypt and Nigeria	1,437 (47.1% female; N=677)	"To determine the knowledge, attitude, and perceptions of Egyptians and Nigerians towards the COVID-19 pandemic"	Women were 1.59 times more likely to have a positive attitude towards COVID-19 than men (95% CI 1.27-1.99; $p < 0.001$ ) and less likely to have poor COVID-19 related knowledge (OR 0.79; 95% CI 0.63-0.97; $p=0.031$ ) than men.

**Table B. Non-peer-reviewed cross-sectional studies (N=6) that include gender analysis of knowledge, attitudes, or practices related to COVID-19**

Organization	Title	Population	Sample Size	Gendered Results
<b>EGYPT (N=1)</b>				
UN Women	Women and the COVID-19 Pandemic in Egypt	Adult women living in Egypt	1,518	<ul style="list-style-type: none"> <li>58% of women felt that other household members were unaware that "leaving the house frequently" could increase their risk of infection.</li> <li>71% of women were "very concerned" about a household member contracting COVID-19, while over 50% of women were concerned that their husband specifically may expose them to the virus due to carelessness.</li> <li>The majority of women reported adhering to preventative measures, as approximately 90% of respondents described maintaining hand hygiene and avoiding greeting or meeting with others.</li> </ul>
<b>IRAQ (N=1)</b>				
Oxfam	Gender analysis of the COVID-19 pandemic in Iraq	Adolescents and adults living in the Kirkuk, Diyala, and Sulaimaniyah governorates of Iraq	207 (58.5% female; N=121) + 20 key informant interviews	<ul style="list-style-type: none"> <li>Women have less access to pandemic-related information than do men, possibly due to greater illiteracy and less internet accessibility.</li> <li>Women more likely to rely on word-of-mouth and television for information.</li> <li>Men and women had similar levels of COVID-19 knowledge.</li> <li>Women were more likely to report being unable to comply with preventative measures due to competing economic interests that precluded their ability to purchase disinfectants or other items.</li> <li>Boys and men less likely to adhere to social distancing recommendations.</li> </ul>

Organization	Title	Population	Sample Size	Gendered Results
<b>JORDAN (N=1)</b>				
Gender and Adolescence: Global Evidence	Exploring the impacts of COVID-19 on adolescents in Jordan's refugee camps and host communities.	Palestinian, Jordanian, and Syrian adolescents living in Jordan	100 in-depth interviews	Girls had limited knowledge compared to boys, possibly due to restricted mobile phone and internet accessibility.
<b>PALESTINE (N=2)</b>				
Arab World for Research & Development	Coping with COVID-19 Pandemic: Impacts and Coping Strategies among Palestinians	Adult Palestinian social media users in Gaza & the West Bank	650	<ul style="list-style-type: none"> <li>There were additional geographic variations, with fewer residents of Gaza indicating "full" commitment to the lockdown than in the West Bank (29.1% vs. 60.3%), though these were not stratified by gender</li> <li>Female respondents were more likely to report "fully" adhering to the governmental stay-at-home orders, with 60.7% of women but only 43.5% of men indicating their compliance.</li> </ul>
Arab World for Research & Development	Opinion Poll on the Palestinian Government's Performance against the Coronavirus	Employed Palestinian adults in Gaza & the West Bank	800	70% of female respondents compared with 51.3% of male respondents reported abiding by stay-at-home orders.
<b>TUNISIA (N=1)</b>				
UN Women	Tunisian Women in the Face of COVID-19: During and After Confinement	Tunisian adults	Not specified	Women were more likely than men to recognize the severity of the virus and report adhering to social distancing and other preventive efforts.

# Section 10

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