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*Research Article*

### **The impact of the COVID-19 pandemic on women's care work and employment in the Middle East and North Africa**

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# **The impact of the COVID-19 pandemic on women's care work and employment in the Middle East and North Africa**

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## **Abstract**

### **BACKGROUND**

The COVID-19 pandemic was accompanied by widespread childcare and school closures. Emerging evidence – primarily from high-income countries – suggests that these changes increased women's time in unpaid care, which may be a particular challenge for women with paid employment.

### **OBJECTIVE**

The paper examines how women's unpaid care responsibilities and employment changed during the pandemic in the Middle East and North Africa (MENA), specifically: (1) How did the closure of schools and nurseries impact married women's time spent in care work? (2) How were exits from employment related to care responsibilities? and (3) How did changes in employment vary by pre-pandemic type of employment?

### **METHODS**

This paper uses multiple waves of phone surveys from five MENA countries. Country-specific information on school modalities is a key covariate. The analyses present both descriptive statistics and multivariate models for outcomes of care work and employment. Analyses also include fixed-effect logit models, with woman fixed effects, leveraging the multiple observations per woman in the panel.

### **RESULTS**

When schools were totally closed during the pandemic, married women with children under age 18 reported performing more care work. However, exits from employment during the pandemic were not increased by women's care responsibilities.

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## **CONTRIBUTIONS**

Even before the pandemic, structural inequalities pushed women in MENA – particularly married women with young children – out of the types of employment that were difficult to reconcile with care responsibilities. These findings underscore the importance of local employment conditions in mediating the impact of the pandemic on gender inequality.

## **1. Introduction**

The COVID-19 pandemic disrupted childcare arrangements and schools around the world (Gromada, Richardson, and Rees 2020; Kenny and Yang 2021; UNICEF 2021). Women, who perform a disproportionate amount of care work globally (International Labour Organization 2018), may have faced a sharp increase in their care responsibilities as a result of these closures, but may also have experienced more equitable caregiving as a result of the pandemic shock. Possible increases in care burdens are one important factor potentially leading to worse employment outcomes for women during the pandemic. In the United States, women's employment dropped substantially and more so than men's, so much so that the pandemic recession has been referred to as a "shcession" (Alon et al. 2022). However, heterogeneous patterns in the gendered care and employment impacts of the pandemic have been observed across countries (Brini et al. 2021; Hank and Steinbach 2021; Knize et al. 2022), underscoring that these relationships are mediated by the national context.

Existing evidence on the impact of COVID-19 on care work and women's employment has come primarily from high-income countries (HICs) (e.g., Alon et al. 2022; Collins et al. 2021a; Hipp and Bünning 2021; Hupkau and Petrongolo 2020; Kim et al. 2022; Pasqualini et al. 2022; Sánchez, Fasang, and Harkness 2021; Zamberlan, Gioachin, and Gritti 2022). This leaves an important gap in the literature, as the impact of COVID-19 on care work and women's employment may be different in low- and middle-income countries (LMICs), where the gendered division of care work is relatively more unequal and fertility rates are higher (Kenny and Yang 2021).

This paper investigates the impact of COVID-19 on care work and employment for married women with children in the Middle East and North Africa (MENA). MENA had the highest female-to-male ratio of time spent on unpaid care work of any region prior to the pandemic (International Labour Organization 2018). The region also had the world's lowest rates of female labour force participation pre-pandemic (Verick 2018). Even prior to COVID-19, difficulties reconciling care work and employment led women in MENA to frequently leave employment at marriage (Assaad, Krafft, and Selwaness 2022; Selwaness and Krafft 2021). This trend may have been exacerbated since 2020: national

statistics suggest that women in MENA may have been particularly affected by the pandemic. For example, in Egypt, women's labour force participation rates dropped from 16% in the first quarter of 2020 to 12% in the second quarter (CAPMAS 2020a, 2020b).

Although labour market trends for women during the pandemic are concerning, there has been limited in-depth research<sup>4</sup> on the impact of COVID-19 on care work and women's employment in the MENA region. This paper contributes new insights on this important topic, adopting a comparative approach with data from Egypt, Jordan, Morocco, Sudan, and Tunisia. We link longitudinal mobile phone surveys from 2020–2021 that include data on women's care work and labour market outcomes to a dataset we compiled on the timing of school closures in these five countries. This multi-country, comparative approach allows us to assess the relationship between school closures, care work, and employment for married women with children. The findings have important policy implications for gender-responsive pandemic recovery efforts in LMIC contexts where women's labour force participation is already low. We also contribute to the global evidence base on variation in the impacts of the pandemic on women's care work and employment.

## **2. Background and context**

### **2.1 MENA context**

#### **2.1.1 Care work**

MENA has the world's highest gender gap in unpaid care work. Women in MENA spend 4.7 times more time on unpaid care work than men (International Labour Organization 2018). In our five countries of focus, the ratio of women's to men's unpaid care work is substantially higher even than this regional average (Table 1). The ratio of women's to men's unpaid care work is 19:1 in Jordan, 12:1 in Egypt, 7:1 in Morocco, and 6:1 in Tunisia (Charmes 2019; Economic Research Forum and UN Women 2020).

Gender norms and the persistence of a strong female homemaker/male breadwinner norm play an important role in why women in MENA perform most of the unpaid care work (Economic Research Forum and UN Women 2020; El-Feki, Heilman, and Barker 2017; Friedrich, Engelhardt, and Schulz 2021). Women's responsibility for unpaid care work in their households is a rigid obligation, which does not change if they engage in paid employment (Assaad, Krafft, and Selwaness 2022). Other factors reinforce these

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<sup>4</sup> Barsoum and Majbouri (2021) examine employment, care work, and subjective wellbeing in MENA countries. Ilkkaracan et al. (2020) explore the likely changes in care work and employment for women in Jordan, given pre-pandemic patterns and sectoral composition.

gender norms, such as high fertility rates (Krafft, Kula, and Sieverding 2021), which feed into high dependency ratios, coupled with shortages of accessible and affordable care services (Economic Research Forum and UN Women 2020).

**Table 1: Pre-pandemic patterns of care work and employment in MENA**

	Ratio of women's/men's time spent in care work	Women's employment rate in 2019	% of women's employment in public sector	% of women's employment in non-wage work	% of women's employment in private sector wage work
Egypt	12:1	12%	43%	32%	25%
Jordan	19:1	10%	49%	3%	48%
Morocco	7:1	19%	9%	36%	56%
Sudan	N/A	In 2014: 26%	12%	73%	15%
Tunisia	6:1	19%	30%	20%	50%

*Source:* Authors' construction based on care work studies (Charmes 2019; Economic Research Forum and UN Women 2020), employment rate data (see Figure 1), and studies on the structure of employment (Assaad, AlSharawy, and Salemi 2022; Assaad and Salemi 2019; Ebaidalla and Satti 2021; ILO and ERF 2022; Krafft and Assaad 2020)

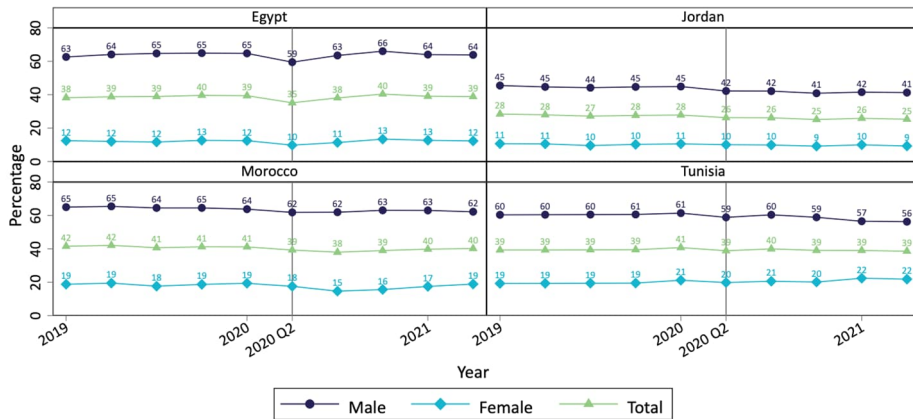
*Note:* N/A notes not available. Sudan data for women in the public sector is based on women in public administration, education, and health, as sector data were not available.

In MENA, married women spend twice as much time on unpaid care work as their unmarried peers (Economic Research Forum and UN Women 2020). There is also a strong association between married women's time spent in unpaid care work and household structure. Across Egypt, Jordan, and Tunisia the presence of children under three years old is associated with the largest increase in unpaid care, followed by the presence of children aged 3–5 years. In most countries, unpaid care work does not increase with the presence of school-age children (aged 6–17), owing in part to their regular enrolment in schooling (Economic Research Forum and UN Women 2020). Thus, school closures due to COVID-19 may lead to changes in married women's time spent in unpaid care work and, consequently, their employment outcomes during the pandemic.

### 2.1.2 Employment

Women's employment rates in MENA were anaemic pre-pandemic (see Table 1). Based on official statistics (Figure 1), in 2019, Egypt, Jordan, Morocco, and Tunisia had similar (low) employment rates among women, at 10%–19%. Very little data is available on Sudan, which had its most recent pre-pandemic survey with labour data in 2014/15. Then, the employment rate for women was 26%, with the majority of women engaged in agricultural self-employment or family businesses (Ebaidalla and Satti 2021).

**Figure 1: Employment rates (percentage), by country, sex, and quarter, 2019–2021**



Source: Authors' construction based on country's official quarterly labour force survey bulletins.

Note: Since employment rates are not consistently reported, we calculate the employment rate ( $e$ ) based on the labour force participation rate ( $l$ ) and unemployment rate ( $u$ ) using the following formula:  $e=l/(1-u)$ . Tunisia labour force participation rates for 2019 are annual rather than quarterly.

When they engage in wage employment, women in MENA tend to be concentrated in public sector jobs because the benefits of such work (especially shorter hours and maternity leave) enable women to reconcile care work and employment (Assaad, Krafft, and Selwaness 2022). Private sector wage employment in the region is not hospitable to women, owing to its longer hours of work, worse working conditions, and the lack of care provision (Assaad, Krafft, and Selwaness 2022; Economic Research Forum and UN Women 2020). Non-wage employment (typically agriculture on a family farm or self-employment) is often home-based and tends to be somewhat easier to reconcile with care responsibilities; however, the degree to which such employment is viable varies across countries (Assaad, Krafft, and Selwaness 2022).

Across our countries of focus, Table 1 shows that employed women are most concentrated in public sector jobs in Egypt (43%), Jordan (49%), and to a lesser extent Tunisia (30%). Morocco and Sudan, which are more agrarian, have more women in non-wage employment (Morocco 36%; Sudan 73%). There is some variability in the participation of women in private sector wage employment across countries, depending on working conditions and compatibility with care responsibilities. Employed women in Morocco (56%), Tunisia (50%), and Jordan (48%) are considerably more likely to work in private sector wage employment than in Egypt (25%) and Sudan (15%). There is thus

important cross-national variation in the nature of women's employment, which may act as a mediator of the impacts of the pandemic.

### **2.1.3 Employment and employment protections during the pandemic**

Research on the impact of the pandemic on MENA labour markets emphasizes how impacts varied substantially by sector (Krafft, Assaad, and Marouani 2021a). Most countries in the region adopted multiple measures that attempted to reduce the labour market impacts of the pandemic; the Appendix details country-specific response measures and we summarize regional patterns here. In terms of employment protection, labour market responses to the pandemic were primarily targeted at workers in the public sector, and to a lesser extent formal private sector workers who contribute to social security (Krafft, Assaad, and Marouani 2021b, 2022). These responses included paid or unpaid leave, wage subsidies, and/or reduced work time.

There were minimal responses that protected jobs for vulnerable workers, particularly informal wage workers and those in non-wage employment (Krafft, Assaad, and Marouani 2021b, 2022). Some short-term financial assistance (but necessarily no binding employment protection) was provided to informal workers (Krafft, Assaad, and Marouani 2021b, 2022). The main mechanism through which government responses may have indirectly mitigated against job losses in these categories was through fiscal stimulus to support businesses. However, the largely informal sector which employed such workers, constituted disproportionately of microenterprises, very rarely received government support (Krafft, Assaad, and Marouani 2021a).

As a result of these responses, layoffs, suspensions, and loss of income among wage workers were rare in the public sector but more common in the private sector, particularly for informal workers (Krafft, Assaad, and Marouani 2022). Non-wage workers (self-employed workers and farmers) struggled during the pandemic and were not a central target of policy responses or employment protections. However, there was substantial recovery in terms of employment rates from November 2020 through June 2021 (Krafft, Assaad, and Marouani 2022).

Figure 1 presents national statistics on quarterly employment rates, by sex, over 2019–2021, based on official statistics. Sudan is not included as it did not conduct any labour surveys during this period. Employment rates fell with the initial pandemic lockdown period in Q2 of 2020, to a relatively similar extent for women and men. Employment then generally recovered, although Morocco experienced a slightly more disparate trend, with men's employment dropping from 64% in Q1 of 2020 to 62% in Q2 and Q3, while women's dropped from 19% to 18% in Q2 and then 15% in Q3 but recovering back to 19% by Q2 of 2021, while men's employment stagnated at 62%.

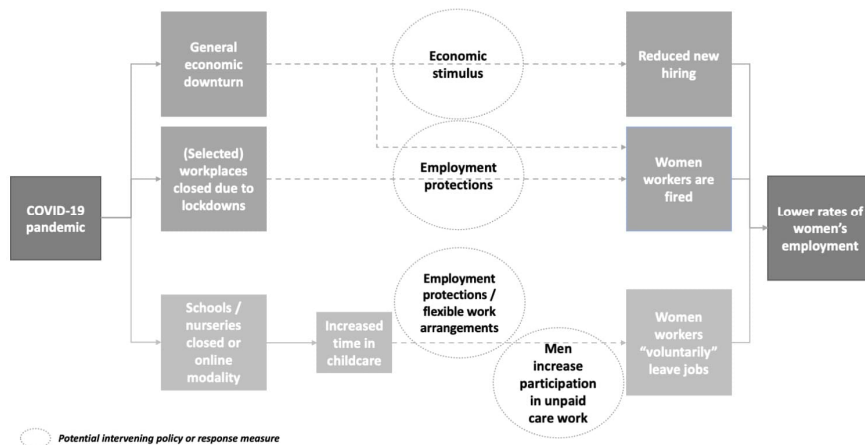


Overall, the national statistics do not suggest a particular impact on women in MENA, but impacts may be quite heterogenous across different types of workers – a point we explore in this paper, focusing on married women with children and women employed in different sectors.

## 2.2 Potential pathways between the pandemic, care work, and women’s employment

The theoretical impacts of the COVID-19 pandemic on employment may operate through a number of gendered pathways (Figure 2). On the labour supply side, the pandemic resulted in widespread closures of schools and childcare facilities. In many but not all contexts the resulting increased care burden fell predominantly on women (Corsi and Ilkharacan 2022; Hank and Steinbach 2021). As a result of increased incompatibility between employment and care responsibilities, women may have made the “deeply constrained choice” to leave employment (Collins et al. 2021b).

**Figure 2: Conceptual framework of the impacts of the COVID-19 pandemic on women’s employment rates and potential intervening policy or response measures**



Source: Authors' construction.

Correspondingly, in some HICs the gender gap in the impact of the pandemic on employment was higher among workers with children (Albanesi and Kim 2021; Alon et al. 2022; Fuller and Qian 2021; Kim et al. 2022), although this was not observed in all contexts (Brini et al. 2021; Hank and Steinbach 2021; Knize et al. 2022). Evidence from LMICs is more limited, but a study of a number of countries in Latin America and the Caribbean demonstrates that the negative effects of the pandemic on employment were particularly acute for women with school-age children (Hoehn-Velasco et al. 2022; Viollaz et al. 2022). While the evidence on why these varying effects have been observed across countries is inconclusive, the nature of school closures or alternative learning modalities may be important.

To examine this phenomenon in more detail, studies from the United States have linked geographic or temporal variation in school closures to employment rates. Employment of mothers with elementary-school-aged children declined more than that of fathers, and the gap was largest where fully remote (as opposed to hybrid or in-person) schooling was adopted (Collins et al. 2021b). Mandatory closures increased unemployment rates for mothers of young children, an effect that persisted even after childcare centres began to reopen (Russell and Sun 2020). Drawing on this literature, and given the context of employment and care economies in MENA, we hypothesize:

*H1: Among (ever) married women with school-age or younger children in the household, during periods when schools and nurseries were closed, time spent on care work increased, compared to when schools were open and operating normally.*

*H2: The pandemic caused married women with school-age or younger children in the household to exit employment more than other women.*

Literature from HICs on labour demand has focused on the fact that pandemic-related lockdowns as well as general economic downturns led to job losses in service sectors with high shares of female workers, such as tourism and hospitality (Albanesi and Kim 2021; Alon et al. 2020, 2022). These sector-dependent, labour demand-side pathways contributed to greater reductions in female than male employment in a number of HICs (Albanesi and Kim 2021; Alon et al. 2022; Corsi and Ilkkaracan 2022). However, other studies of HICs have found no disproportionate effects of the pandemic on women's employment or care work relative to men's (Brini et al. 2021; Hank and Steinbach 2021; Knize et al. 2022).

Likewise, in some LMICs, women were more likely to experience job losses and reductions in employment hours than men (Seck et al. 2021). However, in other countries, including many of those in MENA, women were not as heavily concentrated in service sectors at high risk of pandemic-related job losses (Alon, Doepke, and Manyшева 2022;

International Labour Organization 2020; UNDP 2021). Rather, high shares of women were employed in education and healthcare, ‘essential’ sectors where the public sector plays a strong role and where healthcare saw an increase in demand during the pandemic (Ilkkaracan et al. 2020; UNDP 2021). The strong sectoral gender division of employment in the MENA region may mitigate job losses among women. We therefore hypothesize:

*H3: Impacts of the pandemic on women’s employment depend on the type of employment they engaged in pre-pandemic.*

Importantly, mitigating the different pathways through which the pandemic may impact women’s employment necessitates different policy approaches. On the demand side, countries implemented a wide range of employment protection and economic stimulus measures intended to prevent (permanent) job losses (IMF 2021; Webster, Khorana, and Pastore 2022). On the supply side, different types of employment protections and flexible work arrangements may protect women from being forced to leave the labour market due to competing childcare demands (Corsi and Ilkkaracan 2022). A non-policy mechanism that would protect women employees from leaving employment would be for their husbands to take on a greater share of the increased childcare burden, which protected employment in the United States (Petts, Carlson, and Pepin 2021).

### **3. Data**

#### **3.1 Surveys**

We use all waves and countries of the COVID-19 MENA Monitor (CMM) household mobile phone surveys (OAMDI 2021).<sup>5</sup> Waves took place in November 2020, February 2021, April 2021, June 2021, and August 2021. The surveys covered Egypt (two waves), Jordan (three waves), Morocco (four waves), Sudan (two waves), and Tunisia (four waves). Approximately 2,000 respondents were contacted per wave in each country and the surveys attempted to follow all respondents across waves, creating a panel. Respondents were also asked retrospective questions about key measures prior to the pandemic (i.e., in February 2020), such as labour market status.

The population targeted for the surveys was all mobile phone users aged 18–64 in a country. Respondents were sampled by random digit dialling, with up to three attempts to complete the survey. Samples were stratified by mobile operators’ country-specific

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<sup>5</sup> Data are publicly available from [www.erfdataportal.com](http://www.erfdataportal.com).

market shares. Refresher households were added in later waves to address attrition. Weights were constructed based on nationally representative in-person surveys pre-pandemic to account for differential non-response among mobile phone owners on observable characteristics. Weights for the panel sample also accounted for these and other characteristics in modelling attrition. Limitations of these data include that they only represent the population of mobile phone users, as well as any bias generated by initial non-response and attrition that is not captured by the weighting scheme.

We restrict our analysis sample for testing H1 to ever married women with children in the household, since our research question is specific to this group. The sample of ever married women includes both currently married and divorced or widowed women, since divorced and widowed women with young children are likely to be affected by care responsibilities induced by school closures in a similar way to currently married women. Furthermore, divorced and widowed women constitute only 7%–10% of women across countries, and thus there is not a sufficient sample to estimate our models separately for them. Employment analyses (H2 and H3) are specific to women who were employed pre-pandemic in February 2020, since our employment hypotheses are about exiting for those who were employed. Table 2 presents the sample size for these different samples, by country and wave.

**Table 2: Sample size (number of observations) by wave and country, various samples**

Wave:	Nov. 2020	Feb. 2021	Apr. 2021	Jun. 2021	Aug. 2021
<b>Sample of women</b>					
Jordan		1,218		1,182	1,217
Morocco	836	675	693	712	
Sudan			1,081		1,030
Tunisia	824	825	841	832	
Egypt		729		733	
<b>Sample of married women with children in the household</b>					
Jordan		781		799	832
Morocco	449	377	382	304	
Sudan			408		299
Tunisia	392	408	423	439	
Egypt		496		534	
<b>Sample of women employed in February 2020</b>					
Jordan		231		220	232
Morocco	150	127	223	231	
Sudan			107		135
Tunisia	314	302	288	302	
Egypt		182		167	

Source: Authors' calculations based on the COVID-19 MENA Monitor, all waves.

### **3.2 School closure data**

We also compiled a dataset that tracks school and nursery closures in the five countries for the entire CMM data collection period on a weekly basis. The data were based on the UNESCO (2021) global monitoring of school closures database, complimented by information from each country's Ministry of Education. When gaps remained after collating information from these two sources, we used Google searches about school closures (drawing mostly on newspapers) to complete the dataset. The Ministry and news sources were also used to determine which type of closure (e.g., online classes only, classes only for certain grades) or reduced capacity modality (e.g., alternating shifts) was adopted. When detailed data on closure types or dates was not found, the UNESCO data was adopted. When information differed between the UNESCO database and official sources, the data from official sources was triangulated and was used if it was consistent, given that some UNESCO monitoring data were outdated due to last-minute changes in some countries. Internet searches were conducted in English and Arabic, as well as French for Morocco and Tunisia.<sup>6</sup>

The calendar data were compiled for three levels of education (nursery, primary, and secondary school) in each country. For each country–week–school-level combination, the following codes were possible: totally closed, open (in-person as usual), partially open (e.g., only some days in-person), entirely online, on break/not in session (e.g., summer break). These data were transformed into a vector indicating whether there were closures and their extent each week. Since in almost all cases all education levels followed the same modality, the data were collapsed into a single vector. In the few cases where only a few selected grades, such as exam years, were attending in-person classes, the modality followed by the majority was adopted. The resulting key covariate was measured at the time (week) each respondent was interviewed in each wave.

### **3.3 Outcomes**

The key outcome we examine for H1 is care work. We focus on responses to the question ‘How does the time you spent caring for children in the past week compare to the time you spent in a normal week in February 2020?’ with the option choices of ‘more than usual’, ‘same’, or ‘less than usual’. This question was only asked of women in households that included children under 18. In our multivariate models we focus on (ever) married women with children under 18 in the household since previous studies have demonstrated that this is the population of women with the greatest care responsibilities (as compared

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<sup>6</sup> We also validated our school closure data against the Oxford COVID-19 Government Response Tracker, as detailed in the Appendix.

to unmarried women or women without children under age 18) (Economic Research Forum and UN Women 2020) and they are thus most likely to have been affected by school and nursery closures.

The key outcome we examine for H2 and H3 is employment, based on a yes response to either 'In the past 7 days, did you spend at least one hour working?' or 'Were you attached to a job in the past 7 days but were temporarily absent from it?' The definition of employment thus covers all types of work, whether formal or informal, wage or non-wage.

### **3.4 Covariates**

Our key covariate for H1, the care work outcome, is closure metrics from the calendar data. In our models for the employment outcome we include a covariate for being ever married, a covariate for having school-age or younger children in the household, and the interaction between these two variables, given evidence that married women and especially married women with young children do more care work (Economic Research Forum and UN Women 2020). Specifically, from the question on marital status we create a binary variable for being ever married: (0) never married versus (1) ever married.<sup>7</sup> We also create a binary variable for having school-enrolled or younger children in the household. This is based on two questions, one on the number of children under age 6 in the household and the other on the number of school-enrolled children in the household.<sup>8</sup> This variable is coded as (0) not having school-enrolled or younger children in the household<sup>9</sup> or (1) having school-enrolled or younger children in the household. Our key covariate to test H2 is the interaction between being an (ever) married woman and having school-age or younger children in the household.

To test H3, the employment outcome, we also include initial (February 2020, pre-pandemic) employment status, categorized into public sector wage work, private sector wage work, or non-wage work. The latter is employment for which the respondent does not receive a wage or salary (including being an employer, self-employed, or an unpaid family worker) and may or may not be informal. Non-wage work is employment per the International Conference of Labour Statisticians (ILO 2013). In addition to these key covariates, our models control for household size, number of children aged 0–5 in the

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<sup>7</sup> 'Married' thus includes those currently married and those widowed/divorced.

<sup>8</sup> The survey only has these questions; there is no information on the children's exact ages to be able to further disaggregate in the analysis.

<sup>9</sup> The survey does not capture relationships between different household members, so these may not be the respondents' own children. However, the share of nuclear households in the region is high (Assaad, Krafft, and Rolando 2017). In our data the median household size is four persons, the 75<sup>th</sup> percentile six persons, and the 90<sup>th</sup> percentile eight persons: sizes suggesting we are largely capturing nuclear households.

household, number of children enrolled in school in the household, age of the respondent (categorically), education level, urban/rural residence, administrative level 1 geography (state, governorate, or province, depending on the country), and wave of the survey.

## 4. Methods

We initially present descriptive statistics to illustrate our outcomes and key covariates. For our multivariate models, we estimate logit models for the H1 outcome of more care work than usual compared to February 2020 (versus same or less) and H2 and H3 outcomes of being employed (versus not employed) in the past week. We also estimate fixed-effect logit models, with woman fixed effects, leveraging the multiple observations per woman in the panel. Standard errors are clustered at the individual level, since clustering on geographies is not necessary when sampling from the population is random, even if there is within-geography correlation in outcomes (Abadie et al. 2023). Clustering at the individual level is appropriate when the sample is panel data (Abadie et al. 2023). Weights are used throughout.<sup>10</sup>

Models are estimated both pooled across countries<sup>11</sup> and separately for each country. Note that not all countries are included in every wave of the survey, as shown in Table 2. As a result, while wave main effects are included in the models and presented, the reference category may vary by model (the first wave vs. latter waves for the pooled model; the first wave within a country vs. subsequent waves collected in that country for country-specific models). Correspondingly, interaction terms between wave and country vary depending on the waves collected in each country. These are not main effects for country because they are perfectly collinear with the administrative geography level 1 covariates in the model (a particular administrative level 1 geography is unique to a country), or, in the pooled fixed-effects model, are absorbed within the individual fixed-effects. We present odds ratios from the models in our tables along with 95% confidence intervals. These odds ratios are tests of hypotheses, and should not be interpreted as comparisons over time or across countries (Mood 2010).

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<sup>10</sup> For panel data models, weights are based on when the observation was first observed.

<sup>11</sup> For pooled models, weights are normalized on a country basis so that observations from different countries are weighted equally overall within the pooled model.

## **5. Results**

We present the results first for changes in care work and then for employment exits. For each outcome, we present the descriptive and multivariate results together.

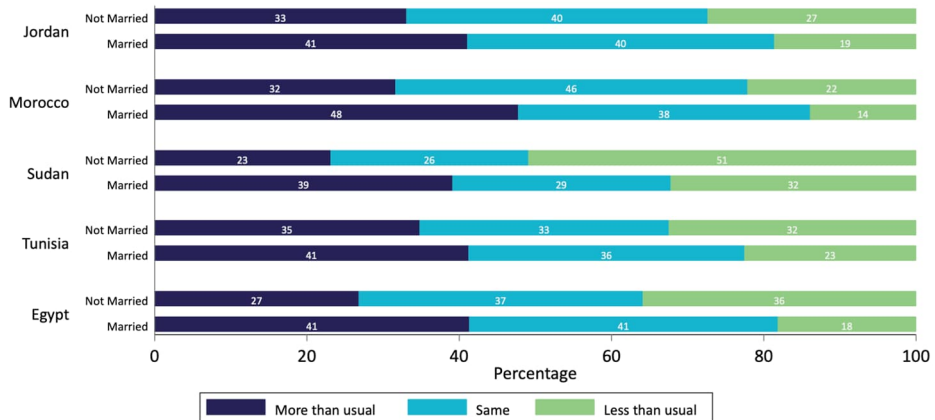
### **5.1 Changes in care work**

Figure 3 presents women's reports of time spent in direct care work (caring for children) in the past week (pooled across waves) compared to February 2020, by marital status. A key descriptive pattern is that (ever) married women in households with children under age 18 were consistently more likely to report doing more care work than prior to the pandemic. Between 39% and 48% of married women reported more care work, compared to 23% to 35% of women who were unmarried (but lived in households with children). Differences ranged from 6 to 16 percentage points across countries. By contrast, women who were unmarried were more likely to report less care work than usual (22%–51% across countries, versus 14%–32% of married women). Overall, there was a clear increase in care work for married women with children. This descriptive result is consistent with hypothesis (H1) that the pandemic created additional care responsibilities for married women with children, a result that we formally test in the multivariate models below.

Figure 4 presents our school calendar data during the periods with survey observations for each country (see Appendix for details). In Jordan, schools were initially partially open during the February 2021 wave, then online only at the end of the school year (June 2021 wave), before being not in session for the latter part of the June 2021 wave and start of the August 2021 wave. By the end of the August 2021 wave, schools had returned to in-person instruction. In Morocco, schools were initially open in-person in November 2020, with some breaks, then starting from the April 2021 wave were partially open. In Sudan, schools were open in-person during the first wave in April 2021 and out of session for much of the August 2021 wave, although school resumed towards the end of the data collection period. In Tunisia, schools were initially partially open in November 2020, but then totally closed for a period of that data collection wave. The following waves of data collection included short periods of closures or not in session mixed with being open in-person, before being partially open during the June 2021 wave. In Egypt, schools were not in session during both periods of data collection. In sum, there is clear variation across time in terms of school closures and modalities in Morocco, Tunisia, and Jordan, but not in Sudan or Egypt.



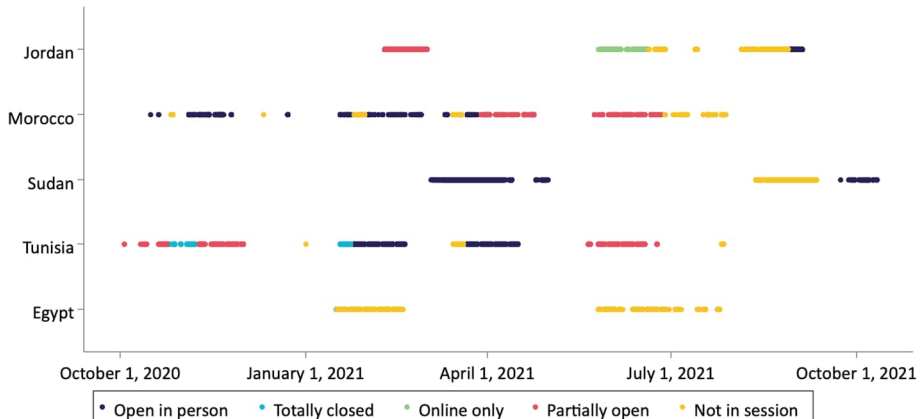
**Figure 3: Direct care work in the past week versus February 2020 (percentage), by country and marital status, women in households with children aged 18 or younger**



Source: Authors' calculations based on the COVID-19 MENA Monitor, pooling all waves.

Note: Married means ever-married women (currently married and widowed/divorced). Table A-1 presents these statistics and 95% confidence intervals.

**Figure 4: Operating status of schools by country and date**



Source: Authors' creation based on school closure data

Note: Showing weeks with survey observations in the COVID-19 MENA Monitor data, pooling all waves.

Our first multivariate model tests H1, that during periods of closure (as shown in Figure 4) care work increased compared to prior to the pandemic for ever married women in households with school-age or younger children. We present pooled and country-specific models both with covariates and then fixed effects (Table 3; most covariates drop in the fixed effect models, since the covariates are largely time-invariant).<sup>12</sup> Note that although we include Egypt and Sudan in the pooled model, we do not present their country-specific results because there was not substantial variation in closures during our study period.<sup>13</sup> For the fixed effect models, it is important to keep in mind that estimates are identified based on variation in outcomes and covariates over time, within the same individual. This is a stronger identification strategy but it does not account for potential time-variant confounders (such as workplace closures or the health situation changing care responsibilities).

**Table 3: Logit models and logit fixed effects (FE) models for increase in care work outcome (odds ratios), married women in households with children aged 18 or younger**

	Pooled	Jordan	Morocco	Tunisia	Pooled - FE	Jordan - FE	Morocco - FE	Tunisia - FE
<i>School closures (open in-person omit.)</i>								
Totally closed	1.976 [1.089,3.586]			1.278 [0.643,2.542]	2.473 [1.160,5.269]			2.511 [1.003,6.289]
Online only	0.614 [0.322,1.169]	0.726 [0.343,1.538]			0.305 [0.137,0.681]	0.152 [0.041,0.565]		
Partially open	1.168 [0.661,2.063]	1.239 [0.743,2.066]	1.241 [0.617,2.494]	0.457 [0.159,1.312]	1.062 [0.562,2.006]	0.419 [0.139,1.260]	0.917 [0.446,1.886]	1.915 [0.505,7.262]
Not in session	0.794 [0.553,1.141]	1.031 [0.612,1.737]	0.693 [0.368,1.304]	0.306 [0.110,0.852]	0.520 [0.320,0.845]	0.263 [0.086,0.808]	0.942 [0.456,1.949]	0.187 [0.061,0.570]
<i>Household size</i>								
	1.004 [0.955,1.054]	1.057 [0.959,1.166]	1.009 [0.923,1.103]	1.015 [0.899,1.146]				
<i>Number of children aged 0–5 in HH (none omit.)</i>								
One child aged 0–5	0.856 [0.695,1.054]	1.166 [0.822,1.654]	0.866 [0.546,1.373]	0.602 [0.396,0.914]				
Two children or more aged 0–5	1.084 [0.822,1.429]	1.201 [0.784,1.842]	0.933 [0.474,1.835]	0.891 [0.467,1.700]				

<sup>12</sup> We also tested a multinomial logit model with the categories 'more care work', 'less care work' and 'same' for the pooled and country-specific models. Less care work was not meaningfully different than the reference category 'same' for any of our closure covariate categories.

<sup>13</sup> Table A-5 in the Appendix re-estimates the pooled models excluding Egypt and Sudan and results are similar.

**Table 3: (Continued)**

	Pooled	Jordan	Morocco	Tunisia	Pooled - FE	Jordan - FE	Morocco - FE	Tunisia - FE
<i>Number of school enrolled children in HH (none omit.)</i>								
One child enrolled	1.058 [0.799,1.400]	0.794 [0.506,1.246]	1.744 [0.881,3.455]	0.834 [0.436,1.596]				
Two children enrolled	0.950 [0.710,1.271]	0.622 [0.394,0.981]	2.259 [1.175,4.343]	0.611 [0.326,1.142]				
Three children or more enrolled	1.052 [0.755,1.466]	0.731 [0.436,1.228]	1.722 [0.810,3.661]	0.885 [0.380,2.060]				
<i>Age group (20–24 omit.)</i>								
18–19	2.362 [0.980,5.697]	1.273 [0.426,3.802]	11.078 [0.983,124.900]					
25–29	1.004 [0.665,1.516]	0.876 [0.500,1.535]	2.246 [0.601,8.394]	0.512 [0.135,1.943]				
30–34	1.098 [0.728,1.655]	1.420 [0.826,2.441]	1.784 [0.473,6.734]	0.626 [0.188,2.091]				
35–39	1.201 [0.788,1.831]	1.726 [0.974,3.056]	2.004 [0.525,7.654]	0.564 [0.163,1.950]				
40–44	1.265 [0.821,1.948]	1.491 [0.824,2.701]	1.850 [0.494,6.937]	0.698 [0.198,2.461]				
45–49	0.925 [0.583,1.466]	1.517 [0.776,2.964]	0.608 [0.154,2.392]	0.445 [0.120,1.644]				
50–54	1.180 [0.707,1.970]	2.189 [1.009,4.746]	1.331 [0.342,5.179]	0.346 [0.084,1.427]				
55–59	0.651 [0.337,1.257]	0.733 [0.232,2.308]	0.757 [0.179,3.197]	0.367 [0.075,1.793]				
60–64	0.520 [0.248,1.091]	0.296 [0.097,0.900]	0.611 [0.119,3.143]	1.412 [0.305,6.526]				
<i>Education level (less than basic omit.)</i>								
Basic	1.271 [0.998,1.619]	1.513 [0.978,2.341]	0.982 [0.593,1.626]	0.901 [0.574,1.415]				
Secondary	1.446 [1.147,1.823]	1.748 [1.142,2.675]	1.223 [0.639,2.342]	1.005 [0.630,1.605]				
Higher education	1.521 [1.193,1.939]	1.894 [1.248,2.874]	0.543 [0.231,1.276]	1.126 [0.710,1.785]				
<i>Location (urban omit.)</i>								
Rural	1.154 [0.937,1.421]	1.210 [0.818,1.789]	0.726 [0.458,1.150]	1.174 [0.795,1.736]				
Camp	0.470 [0.112,1.977]	0.500 [0.131,1.904]						

**Table 3: (Continued)**

	Pooled	Jordan	Morocco	Tunisia	Pooled - FE	Jordan - FE	Morocco - FE	Tunisia - FE
<i>Wave (first wave omit.)</i>								
Feb. 2021	0.461 [0.173,1.230]		0.405 [0.236,0.695]	0.400 [0.168,0.955]	0.326 [0.112,0.952]		0.264 [0.127,0.551]	1.137 [0.327,3.952]
April 2021	1.180 [0.587,2.371]		1.618 [0.816,3.211]	0.565 [0.196,1.627]	1.291 [0.634,2.628]		1.054 [0.499,2.228]	2.386 [0.649,8.772]
June 2021	0.816 [0.466,1.429]	1.596 [0.933,2.729]	0.877 [0.398,1.934]	0.907 [0.510,1.611]	1.082 [0.726,1.613]	2.617 [1.446,4.737]	0.619 [0.251,1.528]	1.039 [0.691,1.562]
Aug. 2021	0.535 [0.249,1.150]				0.439 [0.217,0.889]			
<i>Wave and country int.</i>								
Feb. 2021 # Morocco	0.900 [0.287,2.820]				1.145 [0.286,4.582]			
Feb. 2021 # Tunisia	1.859 [0.522,6.625]				2.076 [0.483,8.925]			
Feb. 2021 # Egypt	1.643 [0.716,3.770]				2.959 [1.035,8.464]			
April 2021 # Morocco	1.438 [0.477,4.332]				1.000 [0.321,3.112]			
April 2021 # Sudan	0.670 [0.214,2.100]				1.381 [0.451,4.227]			
June 2021 # Morocco	1.207 [0.512,2.842]				0.611 [0.245,1.520]			
Admin. 1 included	Yes	Yes	Yes	Yes	No	No	No	No
Ref. prob.	0.421	0.411	0.477	0.412	0.000	0.280	0.383	0.636
p-value (model)	0.000	0.004	0.000	0.001	0.000	0.001	0.000	0.000
N (obs.)	7017	2360	1380	1578	2329	819	512	760
N (ind.)	4428	1374	899	743	862	316	193	234
Pseudo R-sq.	0.062	0.042	0.125	0.069	0.066	0.035	0.136	0.044

Source: Authors' calculations based on the COVID-19 MENA Monitor, all waves.

Note: 95% confidence intervals (standard errors clustered by individual) in brackets. Country main effects absorbed in admin. 1 geography (pooled model) or individual fixed effects (pooled – FE model). Jordan is the omitted country in pooled models. In country-specific models, first wave within the country is omitted (February 2021 for Jordan, note August 2021 is also omitted due to perfect collinearity between wave and school modality; November 2020 for Morocco; November 2020 for Tunisia). Note that not all countries are included in all waves. In the pooled model, country-wave interactions are presented for all the country and wave interactions extant after accounting for wave main effects.

In the pooled model, the reference category for our key covariate is ‘open normally’ (in-person and normal schedule/capacity). Compared to open in-person, when schools were totally closed a report of more care than usual was more likely (odds ratio 1.976,  $p = 0.025$ ). This result carries over into the fixed effect model (odds ratio 2.473,  $p = 0.019$ ) and is particularly sizeable for Tunisia (odds ratio 2.511,  $p = 0.049$ ).

In the pooled fixed effects model, we find that schools not being in session reduced the probability of more care than usual (odds ratio 0.520,  $p = 0.008$ ) as does school being online only (odds ratio of 0.305,  $p = 0.004$ ). These results carry over in country models

for Jordan and Tunisia. In Jordan, schools being online only reduced the odds of more care (odds ratio 0.152,  $p = 0.005$ ) as did school not in being in session (odds ratio 0.263,  $p = 0.020$ ). In Tunisia schools not being in session reduced the odds of more care (odds ratio of 0.187,  $p = 0.003$ ); no periods of online-only education were observed in Tunisia.

Keeping in mind that only some modalities were observed in each country, the results suggest that school closures during periods when school was normally in session increased care work, likely because of the presence of children at home when they would otherwise have been in school or nursery. Parents may have faced increased care responsibilities and attempted to teach children in the place of lost schooling. However, online modalities and not being in session reduced care work. The ‘not in session’ result is intuitive, as families may plan for children to be out of school during these periods, which also cover the summer months when children may be engaged in other activities. Additionally, the ‘not in session’ period would not have required caregivers to support children’s education nor replace lost time in school.

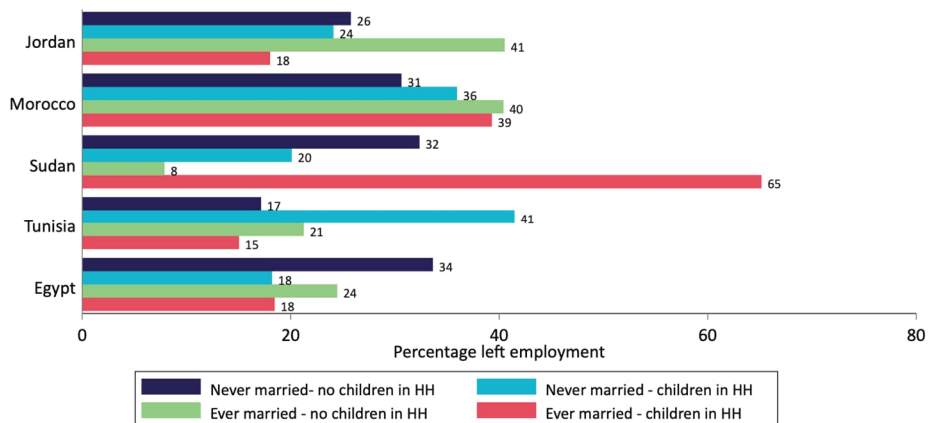
Although the online modalities result is unexpected and contradicts the results found in HICs, low connectivity and capacity for online teaching in LMICs may mean that online school in effect meant no or little schoolwork, or that children were engaged online during the school day but did not have substantial homework. Caregivers may have thus faced less time caregiving but also felt children were being educated and no substitute efforts were needed (unlike when schools were totally closed). A youth survey in Jordan (the country where we observed substantial online learning) corroborates this interpretation: youth reported generally engaging with, but spending less time on, online learning (Assaad et al. 2021). Overall, the results support H1, that when schools and nurseries were closed, time spent on care work increased for married women in households with school-age and younger children. However, the results also suggest important nuance in terms of total closure versus online teaching (which was more like not being in session).

## **5.2 Employment and exits from employment**

We now turn to women’s employment outcomes during the pandemic. We initially describe exits from employment for those who were employed as of February 2020. Exit rates from employment tended to be high, but varied substantially by country and care responsibilities, as illustrated in Figure 5. The figure focuses on having left employment at the time of the wave for women who were employed in February 2020. In Sudan, married women with children were the most likely to have left employment at the time of the survey (65%), relative to 8% for ever married women with no children in the household, 20% for never married women with children in the household, and 32% for

never married women with no children in the household. In Morocco, the chances of married women with children exiting (39%) were similar to those of ever married women without children (40%), although slightly higher than never married women (31%–36%). Married women with children in the household were the least likely to exit of the four groups in Jordan (18% vs. 24%–41%), Egypt (18% vs. 18%–34%), and Tunisia (15% vs. 17%–41%).

**Figure 5: Percentage of women who had left employment at the time of the survey, women who were employed in February 2020, by country, marital status, and household composition**



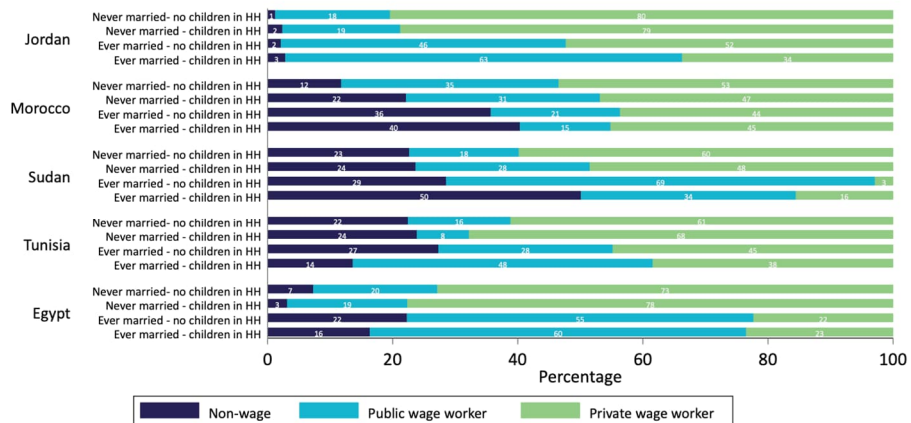
Source: Authors' calculations based on the COVID-19 MENA Monitor, pooling all waves.

Note: Ever-married women includes currently married and widowed/divorced. Table A-2 presents these statistics and 95% confidence intervals.

Figure 6 shows employment type in February 2020 for women who were employed at that time.<sup>14</sup> Married women were consistently less likely to be engaged in private sector wage work across countries (when comparing married women with children to never married women with no children in the household the differences are 8–50 percentage points). In Morocco and Sudan, employed women, particularly those married with children, tended to be engaged in non-wage work (for instance, 50% in Sudan for married women with children vs. 23%–29% for other groups). This non-wage work in Morocco and Sudan is primarily unpaid family work and work in agriculture (Ebaidalla and Satti 2021; Krafft et al. 2022).

<sup>14</sup> Figure A-1 in the Appendix likewise shows the industry of work for women employed in February 2020.

**Figure 6: Employment type in February 2020 (percentage), women who were employed in February 2020, by marital status and household composition**



Source: Authors' calculations based on the COVID-19 MENA Monitor, pooling all waves.  
 Note: Ever-married women includes currently married and widowed/divorced. Table A-3 presents these statistics and 95% confidence intervals.

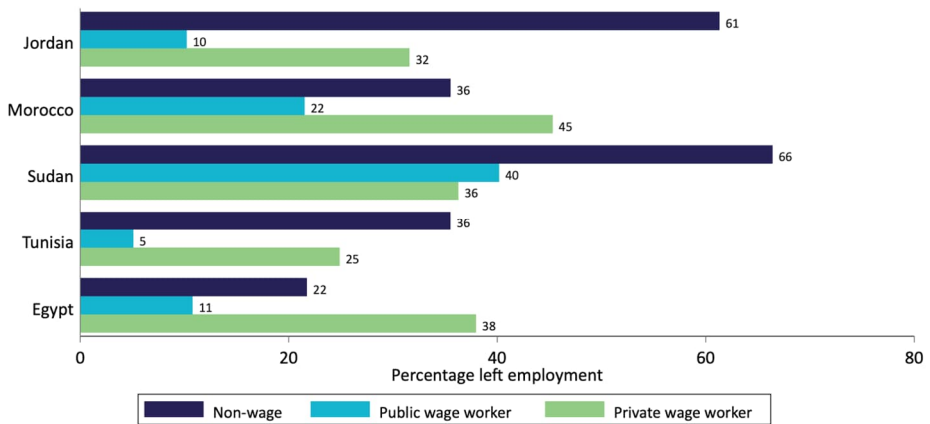
Non-wage work is nearly non-existent in Jordan (2%–3%) and plays a small role in women’s employment in Egypt (3%–22%). In Tunisia, non-wage work is more common for employed women who are not married or have no children (22%–27%) than married women with children (14%). Public sector employment was most common (and disproportionately so) for married women with children in Jordan (63%), Egypt (60%), and Tunisia (48%), but less common for married women with children in Sudan (34%) and Morocco (15%).

Other research has demonstrated that women in MENA tend to leave private sector work at marriage, continue public sector work, and even (depending on the country context) increase non-wage work (Assaad, Krafft, and Selwaness 2022). Our results are consistent with this past research and also underscore that the eschewing of private sector wage work (persisting primarily in public sector employment or non-wage work) may help explain differences in exits across countries.

The intersection between sector of employment and care responsibilities thus helps explain the patterns of exits across countries. Figure 7 shows the percentage of women exiting employment for women who were employed in February 2020, by type of employment in February 2020. Particularly for women who were non-wage workers, rates of exit were very high, ranging from 22% in Egypt to over 60% in Jordan and Sudan.

This may be related to the seasonality of non-wage work, marginal attachment to the labour force among women engaged in non-wage employment, or the well-known challenges of measuring such work (Langsten and Salem 2008). Women in the public sector were the least likely to exit employment: only in Sudan (40%) and Morocco (22%) did exit rates substantially exceed 10%. Exits from private sector work were higher (25%–45%) across all countries except Sudan (36%).

**Figure 7: Percentage of women who were employed in February 2020 who had left employment at the time of the survey, by February 2020 employment status**



Source: Authors' calculations based on the COVID-19 MENA Monitor, pooling all waves.  
 Note: Table A-4 presents these statistics and 95% confidence intervals.

The larger role of public sector employment for married women, especially those with children in the household, can help explain the differential patterns of exit by household composition (Figure 5), particularly in Egypt, Jordan, and Tunisia. Women with children have often selected or been pushed out of the types of employment (particularly private sector work) that are difficult to reconcile with family responsibilities. Married women with children who were employed at the start of the pandemic may thus have had an easier time retaining their jobs in Egypt, Jordan, and Tunisia. In Sudan and Morocco, where non-wage work is dominant and particularly frequent for married women, high rates of exit from this type of work may explain why married women exited employment more often in these countries during the pandemic. Overall, the descriptive patterns support H3, that pandemic impacts on women's employment depended on the type of employment pre-pandemic.



We now turn to our multivariate models to test H2, whether employment is related to care responsibilities (for women who were employed in February 2020). We test this in a model with employment as the outcome and the interaction of being ever married and having school-aged or younger children as the key covariate (specification 1). In some models we also include initial employment type (H3, specification 2). Because marital status and having school-age or younger children are time invariant in our data,<sup>15</sup> we estimate logit models but cannot estimate fixed effects models. Table 4 presents our results, alternating models without and then with initial employment status for the pooled model and each country.

**Table 4: Logit models for employment (odds ratios), women who were employed in February 2020**

	Pooled		Jordan		Morocco		Sudan		Tunisia		Egypt	
	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2
<i>With children in HH</i>	0.837 [0.328, 2.136]	0.965 [0.368, 2.531]	0.863 [0.199, 3.745]	0.723 [0.167, 3.132]	1.416 [0.234, 8.582]	1.458 [0.227, 9.355]	346.197 [6.556, 18281.432]	367.745 [6.619, 20432.763]	0.255 [0.057, 1.154]	0.246 [0.055, 1.100]	0.381 [0.049, 2.976]	1.053 [0.138, 8.031]
<i>Ever married</i>	0.463 [0.243, 0.883]	0.481 [0.250, 0.925]	0.713 [0.226, 2.248]	0.580 [0.185, 1.820]	0.670 [0.187, 2.398]	0.699 [0.195, 2.512]	9.331 [0.351, 248.067]	7.845 [0.340, 180.876]	0.249 [0.082, 0.759]	0.255 [0.084, 0.780]	1.049 [0.236, 4.665]	0.593 [0.128, 2.757]
<i>With children in HH # Ever married</i>	1.409 [0.618, 3.212]	1.261 [0.546, 2.915]	1.475 [0.298, 7.301]	1.349 [0.288, 6.312]	1.055 [0.228, 4.891]	1.008 [0.213, 4.767]	0.030 [0.001, 0.997]	0.039 [0.001, 1.186]	6.806 [1.659, 27.920]	6.319 [1.434, 27.846]	0.559 [0.083, 3.778]	0.373 [0.054, 2.560]
<i>Feb. 2020 labour mkt. status (public omit.)</i>												
<i>Non-wage</i>		0.368 [0.194, 0.697]		0.095 [0.037, 0.245]		0.792 [0.291, 2.158]		1.551 [0.335, 7.174]		0.194 [0.048, 0.785]		0.475 [0.133, 1.697]
<i>Private wage worker</i>		0.355 [0.215, 0.586]		0.240 [0.121, 0.475]		0.561 [0.207, 1.523]		0.865 [0.226, 3.304]		0.204 [0.061, 0.689]		0.111 [0.041, 0.304]
<i>Household size</i>	0.921 [0.832, 1.020]	0.927 [0.836, 1.028]	1.103 [0.901, 1.351]	1.111 [0.908, 1.361]	0.951 [0.816, 1.109]	0.948 [0.813, 1.106]	0.985 [0.786, 1.236]	0.980 [0.786, 1.222]	0.670 [0.525, 0.854]	0.699 [0.548, 0.892]	1.248 [0.928, 1.678]	1.234 [0.909, 1.675]
<i>Number of children aged 0–5 in HH (none omit.)</i>												
<i>One child aged 0–5</i>	1.333 [0.766, 2.318]	1.206 [0.695, 2.091]	1.689 [0.563, 5.071]	1.542 [0.502, 4.736]	1.155 [0.339, 3.944]	1.215 [0.355, 4.158]	0.029 [0.003, 0.284]	0.027 [0.003, 0.292]	0.757 [0.294, 1.949]	0.804 [0.311, 2.078]	3.506 [1.075, 11.437]	1.791 [0.483, 6.645]
<i>Two children or more aged 0–5</i>	0.895 [0.452, 1.771]	0.779 [0.405, 1.499]	0.930 [0.350, 2.471]	0.936 [0.356, 2.461]	2.833 [0.748, 10.730]	2.829 [0.724, 11.046]	0.097 [0.010, 0.956]	0.095 [0.009, 1.021]	0.787 [0.244, 2.540]	0.784 [0.252, 2.445]	0.278 [0.077, 1.008]	0.150 [0.037, 0.607]

<sup>15</sup> These questions were only asked at baseline given limited time and patience for phone surveys and would change little over the less-than-a-year period of the survey.

**Table 4: (Continued)**

	Pooled		Jordan		Morocco		Sudan		Tunisia		Egypt	
	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2
<i>Number of school enrolled children in HH (none omit.)</i>												
One child enrolled	1.096 [0.530, 2.267]	0.982 [0.475, 2.029]	1.144 [0.408, 3.206]	1.335 [0.466, 3.821]	0.293 [0.066, 1.309]	0.279 [0.062, 1.263]	0.004 [0.000, 0.250]	0.004 [0.000, 0.262]	1.915 [0.609, 6.023]	1.941 [0.630, 5.975]	7.295 [1.885, 28.232]	4.128 [1.038, 16.428]
Two children enrolled	0.878 [0.448, 1.721]	0.768 [0.391, 1.509]	1.194 [0.420, 3.392]	1.293 [0.463, 3.612]	0.572 [0.119, 2.741]	0.523 [0.103, 2.651]	0.003 [0.000, 0.166]	0.003 [0.000, 0.165]	1.718 [0.544, 5.430]	1.646 [0.555, 4.886]	5.123 [1.132, 23.188]	3.294 [0.657, 16.508]
Three children or more enrolled	1.383 [0.634, 3.018]	1.329 [0.601, 2.941]	1.477 [0.413, 5.287]	1.693 [0.461, 6.213]	0.452 [0.100, 2.052]	0.476 [0.102, 2.217]	0.035 [0.002, 0.798]	0.036 [0.002, 0.791]	5.164 [0.963, 27.690]	4.916 [0.939, 25.748]	26.901 [3.140, 230.464]	15.928 [1.930, 131.487]
<i>Age group (20–24 omit.)</i>												
18–19	0.509 [0.124, 2.098]	0.472 [0.115, 1.938]			0.048 [0.002, 1.004]	0.045 [0.002, 0.883]			3.538 [0.521, 24.046]	3.101 [0.405, 23.736]	0.973 [0.103, 9.205]	0.643 [0.063, 6.597]
25–29	1.076 [0.536, 2.160]	1.010 [0.509, 2.002]	0.472 [0.169, 1.315]	0.524 [0.189, 1.454]	1.437 [0.393, 5.250]	1.133 [0.301, 4.270]	0.258 [0.054, 1.243]	0.301 [0.055, 1.651]	1.564 [0.468, 5.228]	1.686 [0.503, 5.647]	0.515 [0.107, 2.480]	0.619 [0.151, 2.537]
30–34	1.917 [0.930, 3.952]	1.745 [0.839, 3.628]	1.967 [0.564, 6.865]	1.773 [0.517, 6.078]	1.130 [0.377, 3.390]	1.046 [0.342, 3.197]	0.216 [0.028, 1.663]	0.200 [0.024, 1.637]	4.400 [1.126, 17.192]	3.271 [0.850, 12.580]	6.015 [1.001, 36.138]	9.074 [1.918, 42.936]
35–39	3.327 [1.353, 8.179]	2.715 [1.072, 6.875]	2.706 [0.772, 9.484]	1.943 [0.527, 7.160]	14.855 [3.858, 57.193]	12.891 [3.182, 52.221]	0.261 [0.022, 3.133]	0.241 [0.021, 2.799]	2.837 [0.631, 12.757]	1.960 [0.433, 8.882]	0.512 [0.087, 3.014]	0.677 [0.107, 4.281]
40–44	2.661 [1.194, 5.932]	1.885 [0.832, 4.274]	2.205 [0.594, 8.182]	1.496 [0.401, 5.585]	1.660 [0.458, 6.019]	1.297 [0.310, 5.426]	3.008 [0.180, 50.258]	3.042 [0.184, 50.265]	1.816 [0.394, 8.380]	1.337 [0.291, 6.142]	2.244 [0.480, 10.496]	1.315 [0.265, 6.520]
45–49	5.207 [2.091, 12.968]	3.884 [1.497, 10.076]	3.272 [0.835, 12.818]	2.069 [0.522, 8.196]	7.418 [1.964, 28.022]	6.237 [1.535, 25.352]	2.030 [0.224, 18.400]	1.974 [0.222, 17.543]	6.524 [1.275, 33.393]	4.376 [0.876, 21.866]	1.174 [0.267, 5.156]	0.542 [0.129, 2.276]
50–54	2.107 [0.845, 5.257]	1.643 [0.646, 4.180]	0.718 [0.149, 3.470]	0.428 [0.062, 2.955]	2.541 [0.537, 12.023]	2.277 [0.459, 11.293]	1.310 [0.063, 27.302]	1.504 [0.073, 31.136]	1.442 [0.354, 5.878]	1.112 [0.275, 4.501]	2.416 [0.449, 12.997]	1.126 [0.190, 6.665]
55–59	7.605 [2.657, 21.768]	4.220 [1.427, 12.480]	0.337 [0.030, 3.805]	0.288 [0.040, 2.091]	2.912 [0.822, 10.320]	2.073 [0.507, 8.482]	780.504 [2.791, 2.18e+05]	1327.225 [3.762, 4.68e+05]	12.649 [2.182, 73.323]	6.827 [1.217, 38.305]	28.663 [2.959, 277.689]	13.084 [1.404, 121.908]
60–64	0.348 [0.094, 1.295]	0.270 [0.064, 1.134]			2.256 [0.151, 33.665]	1.807 [0.126, 25.816]			0.246 [0.022, 2.725]	0.183 [0.016, 2.093]	0.267 [0.041, 1.719]	0.144 [0.013, 1.600]
<i>Education level (less than basic omit.)</i>												
Basic	0.874 [0.491, 1.557]	0.753 [0.418, 1.357]	4.507 [0.958, 21.212]	3.153 [0.671, 14.815]	1.219 [0.540, 2.752]	1.166 [0.509, 2.673]	4.201 [0.068, 260.598]	5.232 [0.079, 345.200]	0.330 [0.128, 0.848]	0.284 [0.110, 0.735]	1.322 [0.286, 6.103]	1.373 [0.286, 6.585]
Secondary	2.031 [1.145, 3.604]	1.701 [0.954, 3.030]	5.191 [1.390, 19.379]	4.319 [1.124, 16.596]	2.480 [0.856, 7.188]	2.538 [0.890, 7.239]	16.180 [0.509, 514.269]	22.028 [0.664, 730.342]	0.992 [0.362, 2.719]	0.826 [0.301, 2.266]	0.407 [0.117, 1.421]	0.225 [0.060, 0.850]
Higher education	3.839 [2.190, 6.730]	2.358 [1.326, 4.192]	9.002 [3.019, 26.843]	4.642 [1.406, 15.328]	10.208 [3.232, 32.244]	8.908 [2.951, 26.889]	19.137 [0.694, 527.582]	33.050 [1.045, 1045.451]	1.300 [0.466, 3.624]	0.560 [0.205, 1.529]	2.437 [0.722, 8.234]	0.935 [0.247, 3.536]

**Table 4: (Continued)**

	Pooled		Jordan		Morocco		Sudan		Tunisia		Egypt	
	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2
<i>Location (urban omit.)</i>												
Rural	1.677	1.810	0.490	0.390	0.824	0.871	0.798	0.769	0.788	0.845	5.227	3.869
	[0.953, 2.951]	[1.002, 3.268]	[0.169, 1.421]	[0.127, 1.194]	[0.239, 2.835]	[0.248, 3.062]	[0.135, 4.704]	[0.119, 4.980]	[0.312, 1.992]	[0.292, 2.447]	[2.029, 13.469]	[1.620, 9.239]
Camp	12.610	18.578	7.982	12.893								
	[0.667, 238.337]	[0.837, 412.196]	[0.393, 162.073]	[0.541, 307.394]								
<i>Wave (first wave omit.)</i>												
Feb. 2021	1.604	1.584			1.868	1.838			1.029	1.049		
	[0.733, 3.512]	[0.737, 3.406]			[0.753, 4.636]	[0.743, 4.548]			[0.530, 1.997]	[0.540, 2.037]		
April 2021	1.100	1.136			4.197	4.175			1.110	1.132		
	[0.562, 2.153]	[0.590, 2.188]			[1.799, 9.790]	[1.792, 9.726]			[0.592, 2.082]	[0.606, 2.114]		
June 2021	1.774	1.802	1.107	1.185	2.585	2.496			1.995	2.004	0.770	0.902
	[0.923, 3.413]	[0.956, 3.395]	[0.715, 1.712]	[0.759, 1.850]	[1.128, 5.926]	[1.074, 5.800]			[1.078, 3.693]	[1.086, 3.698]	[0.382, 1.553]	[0.418, 1.948]
Aug. 2021	1.706	1.788	1.110	1.220			5.205	4.863				
	[0.737, 3.950]	[0.787, 4.058]	[0.647, 1.906]	[0.704, 2.116]			[1.717, 15.775]	[1.563, 15.134]				
<i>Wave and country int.</i>												
Feb. 2021 # Morocco	1.222	1.229										
	[0.390, 3.829]	[0.397, 3.806]										
Feb. 2021 # Tunisia	0.643	0.678										
	[0.323, 1.282]	[0.345, 1.332]										
Feb. 2021 # Egypt	1.097	1.100										
	[0.511, 2.357]	[0.505, 2.398]										
April 2021 # Morocco	3.962	3.598										
	[1.418, 11.067]	[1.276, 10.149]										
April 2021 # Sudan	0.440	0.375										
	[0.084, 2.295]	[0.067, 2.090]										
June 2021 # Morocco	1.441	1.399										
	[0.498, 4.165]	[0.479, 4.088]										
Admin. 1 included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ref. prob.	0.711	0.711	0.781	0.781	0.631	0.631	0.403	0.403	0.789	0.789	0.768	0.768
p-value (model)	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N (obs.)	3174	3174	682	682	729	729	228	228	1206	1206	326	326
Pseudo R-sq.	0.196	0.212	0.149	0.194	0.247	0.251	0.657	0.658	0.249	0.267	0.311	0.360

Source: Authors' calculations based on the COVID-19 MENA Monitor, all waves.

Note: 95% confidence intervals (standard errors clustered by individual) in brackets. Country main effects absorbed in admin. 1 geography (pooled model). Jordan is the omitted country in pooled models. In country-specific models, first wave within the country is omitted (February 2021 for Jordan; November 2020 for Morocco; April 2021 for Sudan; November 2020 for Tunisia; February 2021 for Egypt). Note that not all countries are included in all waves. In the pooled model, country-wave interactions are presented for all the country and wave interactions extant after accounting for wave main effects.

In the pooled model, both with and without February 2020 employment status, the interaction of ever married and children in the household has an odds ratio of more than 1, meaning that ever married women with children are more likely to remain employed, but  $p = 0.415$  (spec. 1) and  $p = 0.587$  (spec. 2). The main effect for ever married is around 0.5 in both models, meaning that ever married women (without children) are less likely to remain employed, with  $p < 0.03$ . There are not large differences by having children in the household (main effect) for the reference category of never married women.

A similar pattern of odds ratios greater than 1 for the key interaction pertains in Jordan and Morocco as in the pooled model. In Sudan, the interaction is less than 1, meaning that ever married women with children are less likely to remain employed and more likely to exit (odds ratio 0.030,  $p = 0.050$  in spec.1; odds ratio 0.039,  $p = 0.063$  in spec. 2). However, this is because of the very large odds ratios on the main effects for children (e.g., 367.754,  $p = 0.004$  in spec. 2) and ever married (7.845,  $p = 0.198$ ), such that never married women with children in the household are the most likely to remain employed. Ever married women with children are the second-most likely to remain employed in Sudan (less so than the never married in households with children, but more so than the never married or ever married without children in the household). In Tunisia, again, the interaction is greater than zero and in fact large (odds ratio 6.319,  $p = 0.015$ , in spec. 2 and similar in spec.1), although this is in part because of odds ratios less than 1 for children in the household (0.246,  $p = 0.066$  in spec. 2 and similar in spec.1) and less than 1 for ever married (0.255,  $p = 0.017$  in spec. 2 and similar in spec.1) for the main effects for the reference category of never married women. These results are thus generally counter to H2 (that the pandemic has caused married women with school-age or younger children to exit employment more than other women).<sup>16</sup>

The results do support H3, that pre-pandemic type of employment matters for whether women remained in employment during the pandemic (see specification 2). Compared to the reference public sector employment status pre-pandemic, women in all other pre-pandemic employment statuses were less likely to remain employed at the time of the survey, except for non-wage workers in Sudan (who were more likely to remain employed than the reference public sector workers, odds ratio 1.551,  $p = 0.574$ ). Differences tend to be substantial; for instance, in the pooled model, compared to public sector work those in non-wage work had an odds ratio of 0.368 ( $p = 0.002$ ) and those in private sector work had an odds ratio of 0.355 ( $p < 0.001$ ).<sup>17</sup> These patterns may,

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<sup>16</sup> In Krafft, Selwaness, and Sieverding (2022), we tested whether there were interactions between type of pre-pandemic employment, care responsibilities, and exit; there were not. Additionally, we tested whether there were interactions between closures, care responsibilities, and exit; there were not. Further, we tested models of employment including all women, not just those employed in baseline, and results were not substantially different.

<sup>17</sup> Additional models in the Appendix (Table A-6) also include controls for industry and employment formality (social insurance). Women in agriculture/manufacturing/construction in the pooled model and in Morocco are

however, be a continuation of existing pre-pandemic dynamics, as women persisted more in public sector work pre-pandemic as well (Assaad, AlSharawy, and Salemi 2022; Assaad and Salemi 2019).

## **6. Discussion and conclusions**

Evidence from HICs suggests that the COVID-19 pandemic disproportionately hurt women's employment (e.g., Alon et al. 2022; Collins et al. 2021a; Hipp and Bünning 2021). Gender inequity, particularly around care work, may also have made women in LMICs especially vulnerable to exiting employment (Kenny and Yang 2021), a pattern that has been found empirically in a number of contexts (Miguel and Mobarak 2022; Viollaz et al. 2022). Indeed, in MENA, descriptive evidence corroborates this pattern (Assaad et al. 2022; Barsoum and Majbouri 2021; Krafft et al. 2022; Marouani et al. 2022). Yet since women exit employment more frequently in non-pandemic times as well (Assaad, Krafft, and Selwaness 2022; Selwaness and Krafft 2021), the role of the pandemic in creating additional care work and driving labour market exits was previously unclear. In this paper we begin to disentangle the relationships between care work and employment during the pandemic.

School closures were frequent in MENA; furthermore, we show that total school closures were associated with increased care work for ever married women with children under age 18 (H1). The increase in care work during closures is consistent with results from elsewhere (Collins et al. 2021a; Petts, Carlson, and Pepin 2021). The finding that women did less care work when children in their households were engaged in online schooling may be because online school effectively acted as care work, but with a lighter workload (e.g., no homework), resulting in a net reduction in care work, unlike in HICs (Collins et al. 2021b). The global literature has underscored the unequal access to remote schooling as well as the learning loss associated with school closures (Conto et al. 2021; Hossain 2021; Khan and Ahmed 2021; Reuge et al. 2021). Unlike in HICs, where online instruction increased care work and reduced female labour force participation (Collins et al. 2021a), in MENA online learning does not seem to have increased care work – but this may have come at the cost of further learning loss.

Although care responsibilities increased for ever married women with children, we demonstrate that these women were not more likely to exit employment (refuting H2).

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less likely to remain employed (but those in Sudan more likely to remain employed) compared to those in health/education. Those with formal employment in February 2020 – in the pooled model, Jordan, Morocco, and Tunisia – are more likely to remain employed. However, these results are not necessarily directly related to the pandemic – women commonly exited informal work at higher rates pre-pandemic (Assaad, AlSharawy, and Salemi 2022; Assaad and Salemi 2019).

Descriptively, compared to other groups, exit rates for married women with children during the pandemic were actually lower in Egypt, Jordan, and Tunisia and higher in Morocco and Sudan. Our results are thus more consistent with other studies that did not find negative employment effects (Brini et al. 2021; Hank and Steinbach 2021; Knize et al. 2022) than with those that did (Albanesi and Kim 2021; Alon et al. 2022; Fuller and Qian 2021; Hoehn-Velasco et al. 2022; Kim et al. 2022; Miguel and Mobarak 2022; Viollaz et al. 2022).

Our results on employment are in part because of the types of employment women undertake in each country and compositional differences in employment by care responsibilities (consistent with H3). Other research has highlighted that in some LMICs, women were potentially protected from the effects of the pandemic because of their concentration in less-affected sectors (Alon, Doepke, and Manyшева 2022). In our research, married women with children were more likely to be engaged in public sector work (Egypt, Jordan, and Tunisia) or non-wage work (Morocco and Sudan) and less likely to be engaged in private sector work. In short, married women with children who were employed pre-pandemic may have already selected or been pushed out of employment that was difficult to reconcile with care work. Married women were also more likely to be in sectors where pandemic-related employment protections were implemented (for example, Egypt implemented work-from-home measures for married women with children in the public sector).

Unfortunately, there is no exact basis for comparison of the rates of exit we estimate to pre-pandemic data or research, as studies use different populations and time frames for transitions. As a point of comparison, using panel data in Egypt, between 40%–74% of women in private sector wage employment and especially non-wage roles exited employment between 2006 and 2012 (Assaad and Krafft 2015). A paper using retrospective data (where transitions are likely under-estimated for many statuses (Assaad, Krafft, and Yassin 2018)) found that for Tunisian women who started in private wage employment, the hazard of exit (probability of exit if still working) each year after marriage was around 20%, although hazards in Jordan and Egypt were lower (Assaad, Krafft, and Selwaness 2022). These high rates of exit for women pre-pandemic underscore the difficulties they face reconciling private sector employment with care work. Although selection out of work appears acute and to affect married women across the board in MENA, there are parallels among women with younger-than-school-age children in HICs: these women have lower rates of labour force participation, are particularly selected, and ended up being relatively less affected by the pandemic (Alon et al. 2022).

## **6.1 Limitations**

Our results may not estimate causal impact for a variety of reasons. The fixed effects models for more than usual care work account for any time-invariant woman-level unobservables, but there may be time-varying unobservables, such as other types of closures (e.g., transport, employment) or other factors driving the relationships we observe between closures and care responsibilities. One important issue we do not observe is whether husbands took on additional care responsibilities. Although the gendered division of care in the region was strong pre-pandemic (Charmes 2019; El-Feki, Heilman, and Barker 2017; International Labour Organization 2018), this could have changed in times of crisis.

Women with children were often non-employed or selected into particular employment statuses that might be more reconcilable with care work (public sector and non-wage work) or easier to exit and re-enter (non-wage work, particularly in agriculture in Morocco and Sudan). Given this selection, our results comparing married women with children to other women should be interpreted with some caution. However, we do note that in MENA there are differences in exit in anticipation of and at marriage, but not for married versus unmarried women (Selwaness and Krafft 2021). Estimates of the endogeneity of marriage also show that marriage is nearly universal for women and not necessarily endogenous (Assaad, Krafft, and Selwaness 2022).

Measurement error may also be an issue in our data, particularly with phone surveys (Heath et al. 2021). Unfortunately, there is limited labour market microdata available in MENA (Ekhatior-Mobayode and Hoogeveen 2022), an issue only exacerbated by the pandemic. Detailed time use diaries were not possible to collect over the phone, and such data were rare in the region even pre-pandemic (Economic Research Forum and UN Women 2020), a particular challenge for assessing changes in care work. Estimates from in-person panel surveys pre-pandemic show high rates of exit from employment among women in both panel and retrospective data (Assaad, AlSharawy, and Salemi 2022; Assaad, Krafft, and Selwaness 2022; Assaad and Salemi 2019; Selwaness and Krafft 2021), consistent with what we observe.

Although the phone surveys were weighted to represent the population of mobile phone owners pre-pandemic in terms of observable characteristics, there may be unobservable non-response or attrition related to key covariates and relationships (such as care and employment) that could bias our results or preclude them from being generalizable. Phone owners are also a selected segment of the overall population, with less-educated women being particularly under-represented, and variation across countries in mobile phone ownership rates (Assaad et al. 2022; Krafft et al. 2022; Marouani et al. 2022).

## **6.2 Policy implications**

The COVID-19 pandemic and school closures created additional care work responsibilities for married women with children. These challenges underscore the fundamental and persistent gender inequity in care work in MENA (Economic Research Forum and UN Women 2020). For example, in Egypt, 98% of men agree that “Changing diapers, giving baths to children, and feeding children should all be the mother’s responsibility” [emphasis added] (El-Feki, Heilman, and Barker 2017). Recognizing, reducing, and especially redistributing care work is a critical challenge in the region (Economic Research Forum and UN Women 2020).

The pandemic offered a potential opportunity to increase men’s involvement in unpaid care work. In Turkey (İlkkaracan and Memiş 2021) and the Asia Pacific (Seck et al. 2021), men’s participation in unpaid care work – while still much lower than women’s – did increase during the pandemic, a dynamic also seen in some high-income contexts (Pasqualini et al. 2022). If men’s greater involvement were to persist after the pandemic receded, it would have the potential to change patterns of care work over the longer term.

The pandemic appears to have neither helped nor hurt women’s employment, which remains persistently low in the region (Assaad et al. 2020; Verick 2018). Promoting women’s employment is an ongoing challenge, and one where care responsibilities may constrain women’s employment, leading them to frequently leave employment, particularly in the private sector, at and in anticipation of marriage (Assaad, Krafft, and Selwaness 2022). Weak labour demand overall and in sectors disproportionately employing women is a further challenge (Assaad et al. 2019). Tackling the barriers to job creation broadly, including crony capitalism (Chekir and Diwan 2015; Diwan, Malik, and Atiyas 2019; Rijkers, Baghdadi, and Raballand 2017), could be important to supporting women’s employment.

Fundamental to both unequal care work and low women’s employment in MENA are social norms that emphasize a male breadwinner/female homemaker paradigm (El-Feki, Heilman, and Barker 2017; Hoodfar 1997). Norms as well as care responsibilities restrict what jobs are socially acceptable for women (Barsoum and Abdalla 2022). Outright employer discrimination against women is also a problem (Osman, Speer, and Weaver 2021). Shifting gender norms – which have remained persistently inequitable across generations in MENA (El-Feki, Heilman, and Barker 2017) – is a challenging task. Schools may provide particularly important opportunities to change norms across generations (Dhar, Jain, and Jayachandran 2022). Substantial norms change across generations is difficult, but possible – the regional shift from gender inequity to equity in education is an important illustration of the potential for change (Assaad, Krafft, and Keo 2019; Krafft, Assaad, and Keo 2022).



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## **Data availability statement**

The COVID-19 MENA Monitor data analysed in the current study are available from the Economic Research Forum Open Access Microdata Initiative at [www.erfdatabportal.com](http://www.erfdatabportal.com). School calendar data and Stata .do files to replicate analyses will be made available on the corresponding author's website.

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## **Appendix: School closures**

This appendix reviews the details of changes to schools and nurseries (early childcare) that may have led to increased care work. We ultimately refer to these closures as school closures for simplicity. In Jordan, nurseries and primary and secondary schools switched to an online format starting in March 2020 and remained so through the end of the 2019–2020 school year (Ministry of Education in Jordan 2020). The Jordanian 2020–2021 school year started with in-person instruction during the first half of September. However, after a rise in COVID-19 cases, the second half of September consisted of online classes for pre-primary and partial in-person instruction for primary students (grades 1 to 3 optional in-person and grades 4 to 9 online), while classes remained in-person for secondary students (US Embassy in Jordan 2020). All classes resumed online from October through mid-January 2021 (Roya News 2020). In February 2021, schools opened for partial in-person instruction (Al-Ziadat 2021) before switching back to online lessons from March until the end of the school year in mid-June 2021 (Ministry of Education in Jordan 2021). The 2021–2022 academic year started in September 2021 with schools reopened at full capacity for in-person learning (The Jordan Times 2021).

In Morocco, nurseries and primary and secondary schools similarly switched to an online format in March 2020 and remained so through the end-of-year break (France24 2020). The 2020–2021 school year started in September, with schools open in partial capacity (limited number of students per class) (Omri 2020). Schools were fully open from October 2020 to March 2021 (Prime Ministry 2020), before switching back to partial capacity in-person instruction from April to June 2021 (UNESCO 2021). The 2021–2022 academic year started in October 2021, with schools reopened at full capacity for in-person learning (Moutamadris 2021).

In Tunisia, public schools were still on academic break in March 2020, but private schools closed their doors (AlHurra 2020). Public schools remained closed during the remainder of the 2020 school year while private schools held classes online (Sadaqi 2020); however, baccalaureate (final year) exam students still went to school in shifts (Tunis Afrique Presse 2020). The 2020–2021 school year started mid-September 2020 with partial capacity in-person instruction through mid-December 2020 (limited number of students per class). However, there were several brief periods during the fall term when schools were completely closed, including for the winter break (Drabble and Verheijen 2020). Schools reopened in-person from January till mid-April 2021, then closed till mid-May 2021 except for students in exam years (Radio Tunisienne 2021). Schools switched back to partial capacity in-person instruction from mid-May to June 2021 before breaking for summer in July (Business News 2021). The 2021–2022 academic year started in mid-September 2021, with schools reopened at full capacity for in-person learning (Shems FM 2021).

Nurseries and primary and secondary schools closed in March 2020 in Egypt, before continuing online from April until the end of the school year in June (Ali 2020). The 2020–2021 school year started in mid-October with partial capacity in-person instruction (students attended 3 to 4 days in-person only) (Sabah 2020), before switching to online instruction in the first half of January 2021 (Nassar 2020). Schools were out of session from the second half of January through the first week of March, with the exception of exams being held for certain grades. Schools then switched back in mid-March 2021 to partial capacity in-person instruction before breaking for summer in May (Masrawy 2021). The 2021–2022 academic year started in October, with schools reopened at full capacity for in-person learning (Al-Ain 2021).

Children in Sudan experienced the greatest disruption in schooling, with nurseries and primary and secondary schools fully closed from March 2020 through September 2020, a period which included the usual summer break (Abdelrahman 2020). With delays in starting the new school year, schools remained closed in October and November 2020 except for exam years 8 and 11, which attended classes in-person. All students went back to school in-person from December 2020 through May 2021 (Albadaoui 2020). The 2021–2022 academic year started in early October, with schools reopened at full capacity for in-person learning (Khabar Press 2021).

As an additional check on our school closure data quality, we compared our measures with those of the Oxford COVID-19 Government Response Tracker (OxCGRT) (Hale et al. 2020). The OxCGRT has a school closure variable that is coded:

0. No measures
1. Recommend closing or all schools open with alterations resulting in significant differences compared to non-Covid-19 operations
2. Required closing (only some levels or categories, e.g., just high school, or just public schools)
3. Required closing all levels.

While our categories are more detailed and likely more meaningful for understanding impacts on care work (e.g., by distinguishing online versus partially open in-person), these metrics allow us to validate our data. Among the dates that we identify as:

- ‘Open in-person’ in our data, the OxCGRT data classifies
  - 5% as having no restriction/closure measures
  - 64% as recommend closing or open with alterations
  - 16% as require closing for only some levels or categories
  - 14% as required closing at all levels
- ‘Partially open’ in our data, the OxCGRT data classifies
  - 0% as having no restriction/closure measures

- 39% as recommend closing or open with alterations
- 61% as require closing for only some levels or categories
- 0% as required closing at all levels
- 'Online only' in our data, the OxCGRT data classifies
  - 0% as having no restriction/closure measures
  - 70% as recommend closing or open with alterations
  - 0% as require closing for only some levels or categories
  - 29% as required closing at all levels
- 'Totally closed' in our data, the OxCGRT data classifies
  - 0% as having no restriction/closure measures
  - 9% as recommend closing or open with alterations
  - 0% as require closing for only some levels or categories
  - 91% as required closing at all levels

In sum, our categories allow for better disaggregation of the potential consequences of closures for care work than the OxCGRT but are generally quite consistent with OxCGRT data.

## **Appendix: Country-specific labour market policies**

In terms of leave, or reduced work time, Jordan allowed a two-week vacation for all public and private sector workers in 2020. This paid leave was not to be deducted from the normal allocation of sick leave (Gentilini et al. 2022). Sudan adopted reduced work time during which employees in the public and (formal) private sectors worked half-time with full pay (Gentilini et al. 2022). Female public sector employees in Egypt with children younger than 12 years or children with disabilities were also eligible for unpaid leave under Decree No. 719 of 2020 (National Council for Women in Egypt 2021).

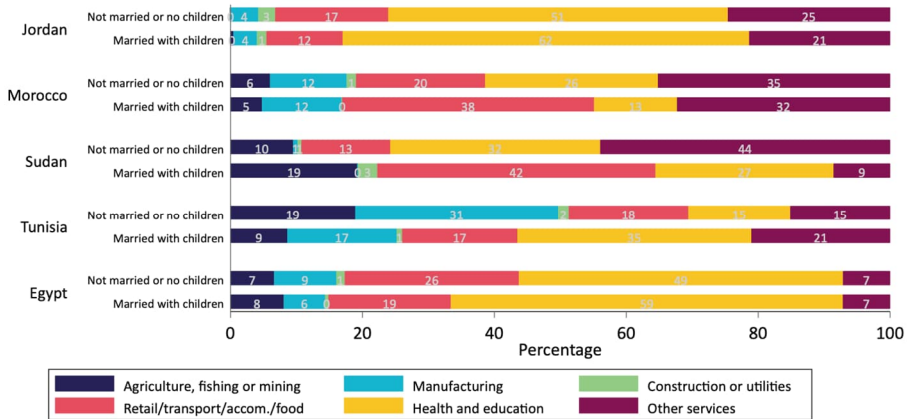
During the lockdown period in 2020 (March–April), public and (formal) private sector establishments were forced to close in many countries, with varying associated labour market policies. In Jordan, government decrees did not allow public or private employers to lay off workers or reduce salaries during closures (Al Nawas 2020). The number of layoffs in formal firms during the lockdown was very small in Jordan, and layoffs were primarily temporary (Kebede et al. 2020). Also, mandatory closures were not applied to private sector establishments that could continue to work remotely. However, almost all of the most vulnerable workers, particularly those working informally without legal protection, lost employment and income during the lockdown (Kebede, Stave, and Kattaa 2020).

In terms of wage subsidies, Jordan introduced the *Estidama* programme to stabilize employment in the private sector. From December 2020 to May 2021 it provided wage subsidies amounting to 50% or 75% of monthly salaries for workers employed by enterprises in the most affected sectors or those unauthorized to function (Gentilini et al. 2022). In Morocco the government paid unemployment insurance to (formal) private sector workers who became unemployed (Krafft, Assaad, and Marouani 2022).

In terms of business support, a number of fiscal stimulus plans either protected existing jobs (e.g., JD 113 million, USD 159 million in Jordan ([Krafft, Assaad, and Marouani 2022]) or sustained business in specific distressed sectors (e.g., EGP 50 billion, USD 3.1 billion for the tourism sector in Egypt [Krafft, Assaad, and Marouani 2022]) or facilitated access to finance (e.g., among SMEs in Morocco [Gentilini et al. 2022; Krafft, Assaad, and Marouani 2022]).

## Appendix: Additional figures and tables

**Figure A-1: Industry in February 2020 (percentage), women who were employed in February 2020, by marital status and household composition**



Source: Authors' calculations based on the COVID-19 MENA Monitor, pooling all waves.  
 Note: Married means ever-married women (currently married and widowed/divorced).

**Table A-1: Direct care work in the past week versus February 2020 (percentage), by country and marital status, women in households with children aged 18 or younger**

	More than usual	Same	Less than Usual
Jordan not married	33.07 (28.24 – 37.89)	39.57 (34.55 – 44.59)	27.36 (22.79 – 31.94)
Jordan married	41.06 (39.07 – 43.04)	40.32 (38.34 – 42.30)	18.62 (17.05 – 20.20)
Morocco not married	31.61 (26.75 – 36.47)	46.23 (41.01 – 51.44)	22.16 (17.82 – 26.51)
Morocco married	47.75 (45.11 – 50.39)	38.34 (35.77 – 40.91)	13.91 (12.09 – 15.74)
Sudan not married	23.10 (19.37 – 26.83)	25.98 (22.10 – 29.86)	50.91 (46.49 – 55.34)
Sudan married	39.10 (35.48 – 42.71)	28.65 (25.30 – 32.00)	32.25 (28.79 – 35.71)
Tunisia not married	34.78 (29.33 – 40.23)	32.75 (27.39 – 38.12)	32.47 (27.11 – 37.82)
Tunisia married	41.23 (38.80 – 43.66)	36.23 (33.85 – 38.60)	22.54 (20.48 – 24.61)
Egypt not married	26.80 (19.63 – 33.97)	37.30 (29.47 – 45.12)	35.90 (28.14 – 43.67)
Egypt married	41.32 (38.27 – 44.37)	40.52 (37.48 – 43.56)	18.16 (15.78 – 20.55)

Source: Authors' calculations based on the COVID-19 MENA Monitor, pooling all waves.

Note: 95% confidence intervals in parentheses. Married means ever-married women (currently married and widowed/divorced). Table corresponds to Figure 3.



**Table A-2: Percentage of women employed in February 2020 who had left employment at the time of survey, by country, marital status, and household composition**

Jordan Never married – no children in HH	25.76 [17.38; 34.14]
Jordan Never married – children in HH	24.09 [15.43; 32.75]
Jordan Ever married – no children in HH	40.52 [29.46; 51.59]
Jordan Ever married – children in HH	18.01 [14.23; 21.80]
Morocco Never married – no children in HH	30.61 [23.32; 37.90]
Morocco Never married – children in HH	35.95 [27.01; 44.89]
Morocco Ever married – no children in HH	40.39 [32.81; 47.98]
Morocco Ever married – children in HH	39.28 [33.68; 44.88]
Sudan Never married – no children in HH	32.34 [21.27; 43.41]
Sudan Never married – children in HH	20.10 [8.47; 31.73]
Sudan Ever married – no children in HH	7.88 [–2.35; 18.11]
Sudan Ever married – children in HH	65.14 [55.17; 75.12]
Tunisia Never married – no children in HH	17.14 [11.33; 22.96]
Tunisia Never married – children in HH	41.46 [30.50; 52.42]
Tunisia Ever married – no children in HH	21.24 [16.70; 25.77]
Tunisia Ever married – children in HH	15.04 [12.27; 17.81]
Egypt Never married – no children in HH	33.63 [16.33; 50.94]
Egypt Never married – children in HH	18.20 [6.19; 30.22]
Egypt Ever married – no children in HH	24.45 [13.15; 35.75]
Egypt Ever married – children in HH	18.46 [13.23; 23.68]

Source: Authors' calculations based on the COVID-19 MENA Monitor, pooling all waves.

Note: 95% confidence intervals in brackets. Ever married includes currently married and widowed/divorced. Table corresponds to Figure 5.

**Table A-3: Employment type in February 2020 (percentage), women who were employed in February 2020, by marital status and household composition**

	Non-wage	Public wage worker	Private wage worker
Jordan never married – no children in HH	1.22	18.33	80.44
	[-0.88; 3.33]	[10.92; 25.75]	[72.84; 88.04]
Jordan never married – children in HH	2.37	18.82	78.81
	[-0.71; 5.45]	[10.90; 26.74]	[70.53; 87.09]
Jordan ever married – no children in HH	2.14	45.56	52.30
	[-1.12; 5.40]	[34.33; 56.78]	[41.04; 63.56]
Jordan ever married – children in HH	2.83	63.45	33.71
	[1.20; 4.47]	[58.71; 68.20]	[29.06; 38.37]
Morocco never married – no children in HH	11.76	34.76	53.48
	[6.67; 16.86]	[27.23; 42.29]	[45.59; 61.37]
Morocco never married – children in HH	22.13	31.00	46.87
	[14.39; 29.87]	[22.38; 39.62]	[37.57; 56.17]
Morocco ever married – no children in HH	35.69	20.66	43.65
	[28.28; 43.10]	[14.39; 26.92]	[35.98; 51.32]
Morocco ever married – children in HH	40.31	14.51	45.18
	[34.69; 45.93]	[10.48; 18.55]	[39.48; 50.88]
Sudan never married – no children in HH	22.65	17.52	59.82
	[12.75; 32.56]	[8.53; 26.52]	[48.22; 71.42]
Sudan never married – children in HH	23.68	27.82	48.50
	[11.34; 36.01]	[14.82; 40.83]	[34.00; 63.00]
Sudan ever married – no children in HH	28.55	68.55	2.90
	[11.39; 45.70]	[50.91; 86.18]	[-3.47; 9.28]
Sudan ever married – children in HH	50.11	34.37	15.52
	[39.64; 60.58]	[24.43; 44.32]	[7.94; 23.10]
Tunisia never married – no children in HH	22.42	16.43	61.15
	[15.99; 28.86]	[10.72; 22.14]	[53.63; 68.66]
Tunisia never married – children in HH	23.85	8.35	67.81
	[14.36; 33.33]	[2.19; 14.50]	[57.41; 78.20]
Tunisia ever married – no children in HH	27.31	27.89	44.80
	[22.37; 32.25]	[22.91; 32.86]	[39.29; 50.31]
Tunisia ever married – children in HH	13.64	47.93	38.43
	[10.98; 16.30]	[44.06; 51.80]	[34.66; 42.20]
Egypt never married – no children in HH	7.29	19.87	72.85
	[-2.23; 16.81]	[5.25; 34.48]	[56.56; 89.14]
Egypt never married – children in HH	3.13	19.23	77.64
	[-2.29; 8.55]	[6.96; 31.50]	[64.67; 90.62]
Egypt ever married – no children in HH	22.28	55.40	22.31
	[11.35; 33.22]	[42.34; 68.47]	[11.37; 33.26]
Egypt ever married – children in HH	16.36	60.18	23.46
	[11.37; 21.34]	[53.58; 66.78]	[17.75; 29.17]

Source: Authors' calculations based on all the COVID-19 MENA Monitor, pooling all waves.

Note: 95% confidence intervals in brackets. Ever-married women includes currently married and widowed/divorced. Table corresponds to Figure 6.

**Table A-4: Percentage of women employed in February 2020 who had left employment at time of survey, by February 2020 employment status**

Jordan non-wage worker	61.31 (49.95 – 72.67)
Jordan public wage worker	10.21 (5.92 – 14.49)
Jordan private wage worker	31.57 (27.08 – 36.07)
Morocco non-wage worker	35.52 (28.27 – 42.76)
Morocco public wage worker	21.52 (12.96 – 30.07)
Morocco private wage worker	45.31 (40.79 – 49.84)
Sudan non-wage worker	66.40 (55.31 – 77.50)
Sudan public wage worker	40.18 (29.27 – 51.08)
Sudan private wage worker	36.27 (26.02 – 46.51)
Tunisia non-wage worker	35.51 (29.74 – 41.27)
Tunisia public wage worker	5.10 (2.34 – 7.86)
Tunisia private wage worker	24.88 (21.64 – 28.11)
Egypt non-wage worker	21.74 (9.77 – 33.71)
Egypt public wage worker	10.77 (5.22 – 16.33)
Egypt private wage worker	37.96 (30.74 – 45.18)

Source: Authors' calculations based on the COVID-19 MENA Monitor, pooling all waves.

Note: 95% confidence intervals in parentheses. Table corresponds to Figure 7.

**Table A-5: Logit models and logit fixed effects (FE) models for increase in care work outcome (odds ratios), married women in households with children aged 18 or younger, pooled models excluding Sudan and Egypt**

	Pooled – Excluding Sudan and Egypt	Pooled – FE – Excluding Sudan and Egypt
<i>School closures (open in-person omit.)</i>		
Totally closed	1.963 [1.084,3.554]	2.389 [1.117,5.110]
Online only	0.522 [0.271,1.005]	0.270 [0.118,0.616]
Partially open	1.114 [0.629,1.973]	1.041 [0.550,1.970]
Not in session	0.692 [0.473,1.012]	0.462 [0.275,0.773]
<i>Household size</i>		
	1.028 [0.968,1.092]	
<i>Number of children aged 0–5 in HH (none omit.)</i>		
1 child aged 0–5	0.818 [0.646,1.036]	
2 or more children aged 0–5	0.981 [0.713,1.349]	
<i>Number of school enrolled children in HH (none omit.)</i>		
1 child enrolled	0.940 [0.684,1.292]	
2 children enrolled	0.799 [0.583,1.094]	
3 or more children enrolled	0.885 [0.609,1.287]	
<i>Age group (20–24 omit.)</i>		
18–19	3.065 [0.828,11.351]	
25–29	1.045 [0.626,1.746]	
30–34	1.314 [0.797,2.169]	
35–39	1.458 [0.871,2.441]	
40–44	1.485 [0.877,2.515]	
45–49	0.976 [0.559,1.703]	
50–54	1.204 [0.655,2.212]	
55–59	0.586 [0.280,1.230]	
60–64	0.514 [0.219,1.206]	

**Table A-5: (Continued)**

	Pooled – Excluding Sudan and Egypt	Pooled – FE – Excluding Sudan and Egypt
<i>Education level (less than basic omit.)</i>		
Basic	1.120 [0.863,1.453]	
Secondary	1.272 [0.974,1.661]	
Higher education	1.378 [1.046,1.817]	
<i>Location (urban omit.)</i>		
Rural	1.066 [0.834,1.361]	
Camp	0.448 [0.109,1.847]	
<i>Wave (first wave omit.)</i>		
Feb. 2021	0.417 [0.156,1.118]	0.295 [0.100,0.871]
April 2021	1.153 [0.573,2.321]	1.277 [0.627,2.604]
June 2021	0.824 [0.470,1.444]	1.084 [0.727,1.615]
Aug. 2021	0.518 [0.241,1.116]	0.435 [0.215,0.882]
<i>Wave and country interaction</i>		
Feb. 2021 # Morocco	1.030 [0.328,3.235]	1.333 [0.328,5.414]
Feb. 2021 # Tunisia	1.977 [0.552,7.080]	2.251 [0.520,9.744]
April 2021 # Morocco	1.546 [0.509,4.695]	1.069 [0.340,3.359]
June 2021 # Morocco	1.273 [0.538,3.012]	0.640 [0.256,1.600]
Admin. 1 included	Yes	No
Ref. prob.	0.428	0.000
p-value (model)	0.000	0.000
N (obs.)	5318	2091
N (ind.)	3016	743
Pseudo R-sq.	0.055	0.056

Source: Authors' calculations based on the COVID-19 MENA Monitor, all waves.

Note: 95% confidence intervals (standard errors clustered by individual) in brackets. Country main effects absorbed in admin. 1 geography. Jordan is the omitted country. Note that not all countries are included in all waves. In the pooled model, country-wave interactions are presented for all the country and wave interactions extant after accounting for wave main effects.

**Table A-6: Logit models for employment (odds ratios), women who were employed in Feb. 2020, model including industry and formality**

	Pooled	Jordan	Morocco	Sudan	Tunisia	Egypt
With children in HH	1.063 [0.402,2.807]	0.802 [0.198,3.246]	1.854 [0.306,11.216]	97.811 [2.038,4693.814]	0.269 [0.061,1.199]	1.111 [0.137,9.004]
With children in HH # Ever married	1.257 [0.548,2.883]	1.303 [0.290,5.863]	1.223 [0.275,5.434]	0.051 [0.001,2.309]	5.274 [1.290,21.561]	0.361 [0.053,2.460]
Ever married	0.490 [0.258,0.932]	0.548 [0.175,1.720]	0.672 [0.202,2.236]	17.207 [0.454,652.749]	0.298 [0.100,0.889]	0.655 [0.145,2.958]
<i>Feb. 2020 labour mkt. status (public omit.)</i>						
Non-wage	0.683 [0.332,1.404]	0.159 [0.053,0.477]	2.220 [0.669,7.369]	0.777 [0.125,4.825]	0.442 [0.091,2.141]	0.520 [0.110,2.457]
Private wage worker	0.491 [0.285,0.844]	0.283 [0.136,0.587]	0.983 [0.328,2.950]	0.649 [0.145,2.902]	0.348 [0.092,1.321]	0.122 [0.036,0.417]
<i>Industry (health/ed. omit.)</i>						
Ag./manuf./constr.	0.532 [0.303,0.935]	0.876 [0.314,2.449]	0.166 [0.043,0.638]	18.790 [2.297,153.671]	0.352 [0.100,1.235]	0.597 [0.228,1.568]
Retail/other serv.	0.830 [0.528,1.304]	1.454 [0.749,2.821]	0.399 [0.139,1.142]	4.495 [0.883,22.872]	0.482 [0.155,1.500]	0.854 [0.329,2.214]
Formal (wage worker w/soc. ins.)	2.288 [1.468,3.567]	2.785 [1.399,5.544]	2.644 [1.079,6.480]	0.263 [0.067,1.038]	2.618 [1.238,5.540]	0.990 [0.316,3.096]
Controls included	Yes	Yes	Yes	Yes	Yes	Yes
Ref. prob.	0.711	0.781	0.631	0.403	0.789	0.768
p-value (model)	0.000	0.000	0.000	0.001	0.000	0.000
N (obs.)	3174	682	729	228	1206	326
Pseudo R-sq.	0.224	0.217	0.278	0.680	0.282	0.362

Source: Authors' calculations based on the COVID-19 MENA Monitor, all waves.

Note: 95% confidence intervals (standard errors clustered by individual) in brackets. Controls include household size, number of children aged 0–5 in household, number of school enrolled children in household, age group, education, location, wave, and admin. 1. In the pooled model, country–wave interactions are included.