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## Understanding the unpaid work roles amongst households, during COVID-19

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### A B S T R A C T

**Background:** Worldwide, the COVID-19 pandemic has had a rapid disruption on work, social activities and family life. Pre-pandemic norms suggested that women spend more time in unpaid work roles and with childcare, while men spend more time in paid work roles. This study aims to understand: 1) the distribution of unpaid work roles within households, and 2) if there are certain factors that explain the unpaid work roles within a household during the pandemic.

**Methods:** This study used a cross-sectional survey of people across the globe, during the pandemic. The survey, administered through a virtual platform of Qualtrics, consisted of the following sections: (a) consent, (b) location and job description (c) marital status and household numbers (d) age, sex, and gender (e) unpaid work roles and family responsibilities. Descriptive statistics and percentages were reported for all the data regarding the study variables. A multivariable regression model was used to understand which factors may explain the changes in unpaid work roles recalling before and during the pandemic.

**Results:** This survey was completed by 1847 participants. The mean age was 30 years old (standard deviation of 13.3). The majority of participants identified themselves as women (76.0%) and single (62.1%). The multivariable linear regression indicated that marital status (single, common-law, married, divorced), higher number of household members (1-8,12), older age, higher number of dependent children, and gender (female) were positive and significant predictors of baseline changes in unpaid work role scores, explaining 50% of the variance ( $R^2 = 0.50$ ).

**Discussion:** All households experienced a significant increase in the amount of unpaid work roles during the pandemic. However, older women who were in a relationship and experienced additional household members such as dependent children or sick older adults, were faced with more changes in unpaid work roles during COVID-19, than other individuals.

### Introduction

Worldwide, the COVID-19 pandemic has had a rapid disruption on work, social activities and family life [1]. On March 11, 2020, the World Health Organization declared COVID-19 a global pandemic, which led to many countries announcing a state of emergency. Rapid closings of businesses, workplaces, schools, and prohibition on large gatherings resulted. Unfortunately, this created an economic crisis, with many people losing employment or being required to work from home [1,2]. Other family members spent more time at home due to home schooling or public health restrictions. This may have increased family role responsibilities while people juggled changing paid and unpaid work roles [2,3].

Finding time for both paid employment and family duties was a challenge for many households, even prior to the pandemic [4]. In particular, mothers experience high and sometimes competing time demands when trying to maintain their paid work roles when their children are young. Despite the steady increase in women's paid work roles over the years, no such reciprocal shift in men's unpaid work roles has been observed.<sup>4,5</sup> Due to inflexible workplace expectations and persistent mas-

culine gender norms, most men still prioritize their employment over home roles (i.e. household chores) [4,5]. On average, working mothers still spend two to three times more daily time with children than fathers do [4–6].

With the existing inequality of unpaid work roles amongst genders, the additional factor of having more dependents within the household increases this inequality. Due to the pandemic, many families have had to adjust their households to care for sick older adults and children, while working remotely from home [7,8]. This shift caused a disruption in the traditional roles of unpaid work that family members would have been used to accommodating before the pandemic.

As seen in previous research, there are several typologies amongst the pre-pandemic division of labour within households, but the most common trend involves the “neo-traditional” division of labour [11]. This means that women are predominately the primary caregivers inside the home and take on more childcare responsibilities than men, who prioritize their paid work roles [10]. Additionally, it can be assumed that dual-earning couples may have options to outsource childcare, and have more paid work roles and outdoor work than other households [10]. The COVID-19 pandemic caused households to reconsider work roles

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**Table 1**  
Demographics of the study participants. n=1847. Percentages and means (standard deviation) were reported.

Variable	Percentage	Mean ± SD
Age		30.0 ± 13.13
Gender		
Man	21.7	
Woman	76.0	
Agender	0.3	
Non-binary	2.0	
Marital Status		
Single	62.1	
Common-law	6.0	
Married	25.5	
Divorced	4.1	
Widow	0.5	
Relationship (not common law)	1.8	
Household members		
1	7.9	
2	17.5	
3	18.6	
4	28.6	
5	12.4	
6	3.9	
7	1.6	
8	0.3	
9	0.1	
10	0.2	
11	0.1	
12	0.1	
Number of dependent children		
0	74.2	
1	10.6	
2	10.3	
3	3.3	
4	0.8	
6	0.1	
7	0.1	
8	0.1	
10	0.1	
Scores of unpaid work roles before COVID-19		44.9 ± 42
Scores of unpaid work roles during COVID-19		46.3 ± 41

between different family members, as the boundaries between work and home life became blurred and work roles changed. Working from home did allow men, to be more physically present at home. With increased physical proximity of all family members and increased salience of family demands, there is potential to shift the traditional gendered norms surrounding the unequal distribution of unpaid work roles among family members. Therefore, this study aims to understand if during the pandemic, 1) the change of unpaid work roles within households, and 2) if there are certain factors that explain the unpaid work roles.

## Methods

### Study design

This study used a cross-sectional survey design. The survey was open for response from June 26 to August 31, 2020. Ethical approval was granted from Western University's Health Sciences Research Ethics Board (WREM:115790). Participants were asked to provide consent via the survey, prior to completion of the survey questions.

### Study population

Inclusion criteria were: Participant must be aged 18 years or older, must read/write in English and be able to provide informed consent to fill out this survey. Participants under the age of 18 years, not able to read/write in English and not cognitively able to give consent were excluded. Since this survey was online, only those who had access to online platforms were able to participate.

### Sample size

Sample size was based on a sex/gender analysis, accounting for four groups: man, woman, non-binary and other gender. The sample size calculation was also based on a power of 0.8, a moderate effect size of 0.5, and a statistical significance of 0.05, indicating over 1800 participants.

### Recruitment

Participants were recruited during physical distancing measures; therefore, virtual platforms were used to recruit participants. Researchers advertised via Facebook, Instagram, Twitter, Kijiji, Craigslist, organizational mailing lists, organizational newsletters, and WhatsApp, with a recruitment poster made by a research assistant. Interested participants were given a link to the online questionnaire where their consent for the study was obtained prior to completing the survey. Participants were eligible to be in the draw for one of three Amazon gift cards upon completion of the survey.

### Survey

No identifying data was collected in this anonymized survey. The survey, administered through a virtual platform of Qualtrics, consisted of the following sections: (a) consent, (b) location and job description (c) marital status and household numbers (d) age, sex, and gender (e) unpaid work roles and family responsibilities. Only authorized study personnel had access to the electronic records and results of the survey.

### Primary outcome of interest

The dependent variable of interest is the change in family and home responsibilities during the pandemic. This variable is the total score from the modified self-reported questionnaire "Home and Family Work Roles Questionnaire". This 19-item questionnaire is on a Likert scale of 0% of "work completed" to 100% of "work completed". The questionnaire aims to understand the distribution of unpaid work roles within a household, i.e. chores, childcare, shopping and home repairs. The questionnaire was completed by participants to capture unpaid work roles both before COVID-19 and during COVID-19. The current study used a modified version of the "Home and Family Work Roles Questionnaire", as a question about supervising children was added to capture the change in roles due to COVID-19.

### Independent variables

In this study, we chose to assess the impact of independent variables of age, gender, number of dependent children, number of household members, and marital status. These variables were self-reported within the overall survey. These variables were chosen based on previous literature and clinical significance. Factors of age, marital status and gender are consistently shown in literature to be drivers of uneven unpaid work roles in families, with older married females having higher unpaid work roles than younger single men [7]. Higher numbers of dependent children and more household members are generally linked to more unpaid work roles within families [7,12]. As shown in literature, this can be linked with having to care for younger children, taking care of sick older adults and needing to do more house chores, as a result of living with many family members (i.e. greater than five immediate family members within the house).

### Data analysis

Descriptive statistics and percentages were reported for all the data regarding the study variables. Means and standard errors were reported for the individual items of the modified "Home and Family Work Roles

**Table 2**  
Mean percentages of unpaid work roles before and during the pandemic by gender. n=1650

Unpaid Work		Gender [Mean (SE)]				
		Man n = 354	Woman n = 1255	Agender n = 4	Non-Binary n = 28	Other n = 9
Cleaning the house	Pre- COVID	4.6 (0.22)	5.4 (0.10)	5.0 (1.66)	6.0 (0.77)	6.2 (1.96)
	During- COVID	5.2 (0.18)	6.1 (0.08)	6.5 (1.5)	5.6 (0.60)	6.5 (0.88)
Outdoor work	Pre- COVID	4.6 (0.22)	3.5 (0.10)	4.5 (1.65)	5.2 (0.79)	6 (1.30)
	During- COVID	5.3 (0.22)	3.8 (0.11)	4 (2.2)	4.9 (9.94)	6.5 (1.55)
Laundry	Pre- COVID	5.1 (0.28)	6.5(0.14)	5.5 (3.05)	5.9 (1.04)	5.7 (2.02)
	During - COVID	5.1 (0.22)	6.5 (0.10)	3.8 (0.75)	5.1 (0.72)	6 (1.4)
Home Decor	Pre- COVID	3.5 (0.27)	5.0 (0.12)	6 (2.89)	5.8 (0.99)	5.2 (1.8)
	During - COVID	3.9 (0.29)	5.1 (0.14)	5 (2.2)	4.7 (1.1)	4.2 (1.9)
Home Repairs	Pre- COVID	4.7 (0.33)	2.9 (0.15)	5.0	4.7 (2.75)	2.8
	During - COVID	5.3 (0.26)	3.2 (0.12)	5 (2.2)	5.1 (0.95)	3.2 (1.49)
Mow Lawn	Pre- COVID	5.2 (0.28)	2.3 (0.14)	4 (2.33)	5.3 (1.31)	0
	During - COVID	5.7 (0.31)	2.4 (0.16)	3 (1)	4 (2.1)	1.3 (1.3)
Garden	Pre- COVID	3.9 (0.21)	4.3 (0.10)	6.3 (1.2)	5.0 (0.73)	10 (1.2)
	During - COVID	4.2 (0.28)	4.6 (1.3)	5.7 (2.5)	6.5 (1.1)	4 (3.05)
Meal prep	Pre- COVID	4.7 (0.22)	5.8 (0.10)	3.5 (2.27)	5.8 (0.77)	6 (1.1)
	During - COVID	5.1 (0.20)	6.1 (0.09)	4.5 (1.0)	5.1 (0.61)	5.2 (1.2)
Groceries	Pre- COVID	5.0 (1.17)	5.9 (0.14)	6.0 (2.8)	6.2 (1.2)	6.2 (3.3)
	During - COVID	5.4 (0.22)	5.8 (0.11)	5.3 (2.5)	6.1 (0.68)	5.4 (1.91)
Drive to appointments	Pre- COVID	3.9 (0.24)	5.4 (0.14)	4.3 (3.06)	4.7 (1.38)	6.6 (2.34)
	During - COVID	4.2 (0.28)	4.9 (0.15)	4 (3.06)	6 (1.22)	6.7 (3.3)
Arrange appointments	Pre- COVID	4.0 (0.30)	5.7 (0.14)	4	5.1 (1.3)	6 (1.87)
	During - COVID	3.2	5.3	4.2	6.2	5.3
Car maintenance	Pre- COVID	3.3 (0.37)	3.6 (0.20)	0	5.1	5
	During - COVID	5.3 (0.27)	3.4 (0.16)	1.5 (2.1)	5.6 (1.44)	5.0 (2.75)
Help with homework	Pre- COVID	4.9 (0.46)	5.8 (0.21)	-	7	10
	During - COVID	3.4 (0.30)	3.5 (0.14)	-	7 (0.80)	10 (2.04)
Supervise homework	Pre- COVID	2.7 (0.30)	5.8 (0.16)	-	10	10(2)
	During - COVID	3.6 (0.44)	6.3 (0.20)	-	6.7 (3)	10
Care for children	Pre- COVID	3.0 (0.29)	5.8 (0.18)	7	5 (1)	8 (0)
	During - COVID	4.3 (0.50)	6.4 (0.21)	7	8.3 (3.5)	9
Take care of sick kids	Pre- COVID	3.1 (0.27)	6.4 (0.14)	-	6 (1.2)	10 (1.7)
	During - COVID	3.1 (0.38)	6.4 (0.17)	10	9.5 (0.89)	9 (1)
Take care of sick family	Pre- COVID	2.9 (0.31)	4.1 (0.13)	6.6 (1.7)	5 (1.4)	5 (3.18)
	During - COVID	3.8 (0.37)	6.6 (0.21)	3.3	6.2 (0.5)	5.5 (1)
Earn income	Pre- COVID	5.2(0.32)	4.6 (0.14)	3.3 (2.9)	5.6 (1.16)	3.7 (2.64)
	During - COVID	5.3 (0.30)	4.4 (0.14)	2 (2.0)	4.5 (1.13)	4 (1.70)
Manage Income/finances	Pre- COVID	5.5 (0.32)	5.5 (0.14)	5 (2.9)	7.1 (1.16)	6 (2.64)
	During - COVID	5.5 (0.30)	4.5 (0.14)	3.3 (2.0)	6.0 (1.13)	5.6 (1.70)

Questionnaire” and stratified by gender; with self-reported recall of pre-COVID-19 unpaid work roles to get a cross-sectional impression of the change in roles pre- and post-COVID-19.

A multivariable regression model was used to understand which factors may explain the changes with the distribution of unpaid work roles recalling before and during the pandemic. This will allow us to better understand the changes in the data and establish relationships with our predictor variable during the early stages of the pandemic. Variables were assessed for all statistical assumptions prior to the analysis; there were no indications of normality violations. Additionally, multicollinearity was assessed using tolerance statistics (1/variance inflation factor). R program (RStudio Team, 2020) was used to compute all models. SPSS (IBM SPSS Statistics for Windows, Version 25.0) was used to categorize all raw data. Missing data was handled by using maximum likelihood.

**Results**

This survey was completed by 1847 participants worldwide. The mean age was 30 years old (standard deviation of 13.3). The majority of participants identified themselves as women (76.0%) and single (62.1%). Demographics of all participants can be found in [Table 1](#).

In [Table 2](#), we reported the percentage values of the individual items of unpaid work completed by gender. These results show an overview of the changes that may have occurred in unpaid work roles between pre- and during the pandemic.

*Men*

From the results, men performed a higher percentage of outdoor work, home repairs and mowing the lawn, compared to other family members within the household before the COVID-19 pandemic. However, once the pandemic occurred, they performed even more of the outdoor work, home repairs, mowing the lawn, driving to appointments, car maintenance and earning the family income.

*Women*

Prior to the pandemic, women performed a higher percentage of cleaning the house, laundry, gardening, meal prep, groceries, driving to appointments, arranging appointments and help with homework, supervising homework, child care, and managing family income. Once the pandemic began, women participated in less of driving to appointments, earning income, managing finances and helping with homework.

*Agender individuals*

People identifying as agender during the pandemic did participate in higher amounts of home repairs, meal preparation, child care and taking care of sick family members than they did before the pandemic. Once the pandemic hit, people identifying as agender participated in less of tasks such as doing laundry, mowing the lawn, garden work, groceries, taking care of sick family members, earning and managing the income. They did however have to increase their roles in cleaning the house, meal prep, car maintenance and child care.

**Table 3**  
Adjusted and unadjusted  $\beta$  coefficients of multivariable linear regression analyses on the dependent of changes of unpaid work roles during COVID-19.  $R^2 = 0.46$  \*\*indicates correlation is significant at the 0.05 level

Predictor	Unadjusted $\beta$	Standard error	adjusted $\beta$	Test Statistic	p-value
Omnibus F-test (F, p-value)				48.64	<0.001
<b>Marital Status</b>					
Single	4.51	0.94	0.12	4.77	<0.001**
Common-law	10.54	3.72	0.29	2.83	0.004**
Married	9.06	3.11	0.35	2.90	0.003**
Divorced	19.68	4.62	0.45	4.25	<0.001**
Widowed	18.17	10.85	5.88	1.67	0.09
Relationship only	8.87	5.75	0.11	1.54	0.12
<b>Total Household members</b>					
1	-4.89	0.67	-0.16	-7.26	0.001**
2	-16.02	3.43	-5.11	-4.67	0.001**
3	-25.35	3.52	-0.32	-7.19	<0.001**
4	-31.38	3.39	-0.88	-9.24	<0.001**
5	-30.60	3.78	-1.08	-8.07	<0.001**
6	-29.95	5.12	-0.68	-5.80	<0.001**
7	-30.77	6.51	-9.88	-4.72	<0.001**
8	-47.94	15.80	-0.64	-3.03	0.002**
9	-17.99	31.15	-0.50	-0.57	0.56
10	-10.12	18.09	-0.28	-0.56	0.57
11	25.70	31.12	0.92	0.82	0.40
12	-52.03	22.02	-1.20	-2.36	0.02**
Age	0.47	0.09	0.01	5.04	0.001**
<b>Dependent children</b>					
1	13.48	3.21	1.22	11.12	<0.001**
2	50.47	3.36	16.10	14.99	<0.001**
3	38.44	5.20	0.51	7.39	<0.001**
4	52.60	9.64	1.48	5.45	<0.001**
6	151.12	34.85	5.42	4.33	<0.001**
10	-44.67	31.28	-1.02	-1.42	0.15
<b>Gender</b>					
Man	0.27	1.51	0.03	0.17	0.44
Woman	5.27	1.91	1.64	2.74	0.001**
Non-binary	-9.38	5.52	-0.12	-1.69	0.08
Agender	-0.80	14.06	-0.022	-0.06	0.95

*Non-binary individuals*

Once the pandemic began, people identifying as non-binary participated less in tasks such as cleaning the house, outdoor work, doing laundry, mowing the lawn, meal prep, supervising homework, and managing and earning the income. They did participate more in tasks such as gardening, driving/arranging appointments, child care and taking care of sick family members, during the pandemic.

In Table 3 we reported the unadjusted and adjusted  $\beta$  coefficients and their corresponding p-values based on separate univariate regressions during COVID-19. Our omnibus F-test was found statistically significant ( $p < 0.001$ ) Our multivariable linear regression indicated that marital status (single, common-law, married, divorced), number of household members (members of 1-8, and 12), age, number of dependent children (1-6), and gender (female) were significant predictors of changes in unpaid work role scores during COVID-19. Our model explained 46% of the variance ( $R^2 = 0.46$ ).

**Discussion**

This study identified that division of labour still remained highly gendered during the pandemic. While men took on more childcare roles than prior to the pandemic, women were still predominately participating in more traditional gendered domestic roles such as childcare and meal preparations. In addition, being a woman, having a higher number of dependent children, or family members, older/younger age and being married were independent predictors of unpaid work role within the family. While factors such as being woman, high number of dependent children, many household members, age and marital status, were

revealed to predict changes in unpaid work roles among families. This study explained half of the variance in workload distribution within the family with a limited number of variables. Other factors such as family circumstances, culture, psychological factors, geographical location and the nature of the pre-pandemic employment and how it changed due to the pandemic are potential contributors, that were unaccounted for. Quantitative surveys can only go so far in understanding complex situations, whereas qualitative studies would provide a deeper understanding of the nature of division of labour in families and how it changed as a result of the pandemic, and what external circumstances contributed to those changes in division of labour.

Even though majority of family members were forced to be physically present in their households, we found evidence that division of labour was still highly gendered. It is important to appreciate that while women took part in more domestic and childcare roles and men in more outdoor work, all family members (despite gender) faced an increase of unpaid work roles during this pandemic. The results indicated that men still showed an involvement of childcare roles; women showed an involvement in repairs or outdoor work; and gender non-binary respondents were driving and making more appointments outside the house which were tasks that were not usually done prior to the pandemic. This increase in work roles could be due to the fact that families were at home for longer periods during the day, and so the number of tasks also increased [14,15]. While we hypothesize that individuals in our study may have made the shift towards a more egalitarian approach when dividing tasks, majority of our participants were single, and therefore may have been required to take on all household jobs, skewing the interpretation of an egalitarian shift. However, in those with a household partner, a study by Shockley et al., quantitatively observed differ-

ent strategies of dividing labour amongst couples during the pandemic [10]. These authors found that the method of “Alternating days” stood out the most in their findings. Alternative days, refers to an egalitarian strategy in which neither parent worked remotely, but alternated the days they went into work, dividing the hours amongst the couple. This strategy can preserve both the well-being and adequate levels of performance of the couple. Ideally this method segments work and family life, which is linked to better health and performance outcomes.<sup>10</sup> While not all households may be able to fully adapt this model, they may be able to adapt parts of the model such as alternating paid work roles, to have better performance in paid/unpaid work roles and less burden among the family members who have felt that they have taken on majority of the unpaid work roles during the pandemic, while still engaging in their paid work roles.

Due to social distancing guidelines because of the pandemic, many households have had to accommodate for older dependent children returning home to their parents’ houses and sick older adults needing to live with their adult children. The shift in more household dependents is likely due to limited access of caregiving services or high risks with contracting COVID-19. With more family members residing in a house, more domestic work occurs for the family members. In this study, we saw that in families with at least 2-8 household members or who have 1-6 dependent children, experienced higher changes in the proportion of unpaid work roles. Families with more than 8 household members might have not shown significance due to the small sample size that represented them in the survey and model. However, an increase of extra family members can provide additional financial, physical and mental stress to the overall household, as not all members may be able to equally contribute to the extra unpaid work roles [11]. Being a caregiver to both older children or sick/elderly adults, can be challenging. As shown in previous studies, additional tasks such as driving to medical appointments, picking up prescriptions and preparing meals based on dietary restrictions can add load to existing unpaid work roles [14,16]. Currently, the literature indicates that men experience more mental health problems with caregiving, compared to women [9]. The lack of support for caregivers, may explain the increase in family members needing to take on more responsibilities such as unpaid tasks, leading to increased “burn out” rates [17,18].

The COVID-19 pandemic forced a shift in the family dynamics at home, marital status was shown, in our analyses, to predict a higher change in unpaid work roles. It can be hypothesized, that additional stressors such as a divorce during the pandemic, may have even exacerbated the divisions of labour further. In previous literature, we see that families cope differently to crisis situations. Theoretical models indicate that depending on a couple’s ability to accept shifting role patterns and expectations, some may adapt rather than rely on previous defaults [11,13]. This strategy may have been used with couples that married, or divorced during the pandemic, where their unpaid work roles changes as a result of their changing relationship status, potentially changing the division of labour. Being widowed or in a relationship (not common law) were both not statistically significant in the model, suggesting their work roles did not change as a result of the pandemic. The focus of this study was to quantitatively understand if marital status led to changes in distribution of unpaid work roles at a single point in time and recalling pre-pandemic work roles. It should be noted, that this survey did not quantify whether marital status was changing during the pandemic. Future studies should look at how these roles change over time, longitudinally, or qualitatively to get a deeper understanding of how relationship status influences unpaid work roles.

A major strength of this study is its large sample size. This led to capturing unique individuals, and their perspective of changes in unpaid work roles. A major limitation is that this survey was cross-sectional, distributed during the pandemic and asking participants to recall pre-pandemic roles. Recall bias should be factored into the interpretation of these results, as it may skew the results towards the null hypothesis. With the ongoing pandemic and subsequent lockdowns, unpaid work

roles may have once again fluctuated, with families becoming more resilient towards the distributions of unpaid tasks. Alternatively, with an increase in vaccination distribution, more workplaces may be requiring return to office, again changing the unpaid work roles. Our sample contained a large proportion of young single women households with no children, again cautioning the interpretation of the results, and recognizing the results to be most representative of that population. The majority of the data from this study was collected during summer months, potentially minimizing the role of supervising children for homework. However, the data was collected worldwide so there may be differences in the education system with some children potentially being in school during the months of July-August. Finally, the typical unpaid work distribution likely differs by countries and their own cultural norms.

## Conclusions

All households experienced a significant increase in the amount of unpaid work roles during the pandemic, however unpaid work roles were gendered. Factors that contribute to higher unpaid work include being woman, having higher numbers of dependent children or family members within the house, older age and marital status. While the model explained 50% of the variance, there may be other factors needed to measure to capture the full picture. Overall, society should give more recognition to the division of unpaid work roles, so that it does not limit the advancement of any gender’s career within society.

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