

Impacts of COVID-19 on the Income and Mental Well-Being of Cismen, Ciswomen, Transgender, and Non-Binary Individuals

Evidence from the 2020 COVID-19 Disparities Survey

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Abstract

This paper uses the first round of the 2020 COVID-19 Disparities Survey to examine the impacts of the COVID-19 pandemic on the income and mental well-being of cismen, ciswomen, transgender, and non-binary individuals. The analysis shows that the pandemic led to high job and income loss expectations among transgender and non-binary individuals. The pandemic has also led to a disproportionate reported decrease in consumption for transgender and

non-binary people compared to cismen, potentially related to a high rate of anxiety, loneliness, and depression observed in the group. The results highlight that the disproportionate economic impacts resulting from the COVID-19 pandemic might cause further declines in the economic conditions of transgender and non-binary people, thus exacerbating existing vulnerabilities in the community.

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Impacts of COVID-19 on the Income and Mental Well-Being of Cismen, Ciswomen, Transgender, and Non-Binary Individuals: Evidence from the 2020 COVID-19 Disparities Survey

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1. Introduction

As the COVID-19 pandemic continues to spread around the world, the lives of millions of people from diverse communities have been affected. The pandemic has impacted not only physical health but also caused socioeconomic disruptions in individuals' lives, including but not limited to putting individuals at risk of losing their livelihoods and causing deteriorations in their mental health.¹ While economic consequences of COVID-19 are widespread and affect all groups, lesbian, gay, bisexual, transgender, and intersex (LGBTI) people are particularly vulnerable and face unique challenges due to existing systemic and social barriers.

Despite some social advancement achieved in the past two decades in some countries, LGBTI people still face discrimination and violence globally. This discrimination and violence often adversely impact their lives -- excluding them from communities and diminishing their well-being through lack of access to basic needs such as education, housing, health, employment, and financial services (Kattari et al. 2016; Koehler et al. 2017; Conron, Goldberg, and Halpern 2018; Ojanen et al. 2019; Badgett, Choi, and Wilson 2019). Existing evidence indicates that LGBTI people suffer from a high rate of unemployment and violence (Conron, Goldberg, and Halpern 2018; Flores et al. 2020). As a result, LGBTI people are more likely to live in poverty and are likely to be overrepresented in the bottom 40 percent of the population (Sexual Orientation and Gender Identity Task Force (SOGI) and Koehler 2015). A World Bank study by Koehler et al. (2017) in Serbia suggests that in addition to experiencing low socioeconomic status, the risk of poverty increases for the LGBTI people suffering discrimination and exclusion. Any disproportionate impact resulting from the COVID-19 pandemic might lead to a further decline in their socioeconomic status and risk the limited gains of the last decades.

¹ See: Blake and Wadhwa (2020); World Health Organization (2020); Vindegaard and Benros (2020); Jackson et al. (2021); Dang and Nguyen (2021).

Several existing studies analyze the effect of the COVID-19 pandemic on LGBTI people. These studies primarily focus on assessing the impact of the pandemic on LGBTI people's health and access to health care services (for example, see: United Nations Human Rights 2020; Banerjee and Nair 2020; Gato et al. 2021; Jarrett et al. 2021; Santos et al. 2021). There are also a few studies on the economic impact of the pandemic on LGBTI people in the United States (US) (Movement Advancement Project 2020; Whittington, Hadfield, and Calderón 2020; Sears, Conron, and Flores 2021). The studies, which are based on US data, find that in addition to a greater risk of health complications during the pandemic, LGBTI people in the US are more likely than non-LGBTI people to live in poverty, lose jobs, experience financial constraints, and lack access to necessities. More widely, a report by OutRight Action International using qualitative in-depth interviews conducted in 38 countries concludes the same (Bishop 2020).

Nevertheless, due to the lack of available quantitative data, little is known about the magnitude of the economic impact of the COVID-19 pandemic on LGBTI people globally. Using multi-national cross-sectional data from the first round of the 2020 COVID-19 Disparities Survey, this paper examines the impact of the COVID-19 pandemic and subsequent pandemic-control measures on the income, consumption, and mental well-being of individuals while accounting for their self-reported gender identity (cismen, ciswomen, transgender, and non-binary). More precisely, the paper investigates the differential economic impacts faced by transgender and non-binary populations due to existing systemic vulnerabilities combined with the COVID-19 imposed public health crisis.

The paper is organized as follows: Section 2 describes the data source and the methodology. Section 3 discusses the main findings under two headings; the first focusing on the impacts of the pandemic on income and consumption and the second focusing on the mental well-being of individuals. Finally, section 4 concludes with a brief summary and discussion of policy implications.

2. Data and Methodology

2.1 Data

The paper uses specialized multi-national cross-sectional data from the first round of the 2020 COVID-19 Disparities Survey to identify the multidimensional impacts of the COVID-19 pandemic on cismen, ciswomen, transgender, and non-binary people. The first round of the 2020 COVID-19 Disparities Survey was collected between April–May 2020 using the social networking app Hornet. Hornet is a queer social networking app with over 30 million users worldwide, including in South Asia, East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, North America, and Sub-Saharan Africa (Santos et al. 2020). Hornet users aged 18 years and older were invited to participate in the survey and 7,427 responses were obtained. While the survey may not be representative of the LGBTI population, nonetheless, it collects valuable information from Hornet users on the impact of COVID-19 on their economic condition, mental distress, and HIV prevention, testing, treatment, and care.

For this study, we categorize gender identity based on the survey question asking respondents to define their identity. We group respondents as cismen, ciswomen, transgender, and non-binary people based on their responses.² Note that the gender identity response categories of cismen, ciswomen, transgender, and non-binary people capture respondents of varying sexual orientations such as heterosexual, gay, lesbian, bisexual, and others.³

The sample in this study consists of the cismen, ciswomen, transgender, and non-binary people for whom all the information on the selected income, consumption, mental distress indicators, and individual, household, and regional characteristics are available. Table 1 summarizes the sample distribution of these individuals by their gender identity. It is important to note that the sample

² As respondents were allowed multiple responses to identify their gender identity, we consider individuals with more than one response non-binary.

³ In the survey, respondents were also asked regarding their sexual orientations. Due to data limitations in each category of sexual orientations (heterosexual, gay, bisexual, and others) of respondents, this paper only focuses on analyzing indicators based on respondents' gender identity.

distribution is significantly skewed, with cismen alone consisting of 6,876 of 7,427 respondents (92.6 percent). Comparatively, the number of ciswomen and transgender people in the sample is small, with only 1.4 percent of respondents being ciswomen (106 respondents) and 1.1 percent of respondents being transgender (83 respondents). Additionally, non-binary people consist of 362 respondents, i.e., 4.9 percent of the sample.

Table 1. Sample distribution by gender identity

	Number	Percent
Cismen	6876	92.6
Ciswomen	106	1.4
Transgender	83	1.1
Non-binary	362	4.9
Total	7427	100.0

Table 2 provides summary characteristics of the survey respondents in our sample by their gender identity. The statistics suggest that the majority of cismen and ciswomen have a university degree or more (57 and 56 percent, respectively), indicating a slightly higher educational level among cisgender individuals compared to transgender (46 percent) and non-binary people (49 percent). Besides, a larger proportion of transgender and non-binary people consider themselves members of ethnic or racial minority groups, 37 and 34 percent, respectively, than those of cismen and ciswomen (18 and 17 percent, respectively).

It is also evident from this survey that transgender and non-binary people are overrepresented in the lower-income groups. While 52 percent of cismen and 46 percent of ciswomen identify as upper-middle socio-economic status, only 37 percent of transgender and 33 percent of non-binary people belong to the same group. Instead, 43 percent of transgender people and half of non-binary people report belonging to lower-middle socio-economic status.

Table 2. Characteristics of sample respondents, by gender identity (percent of total)

	(1)	(2)	(3)	(4)	(5)
	Cismen	Ciswomen	Transgender	Non-binary	All
Average of Age	35.6	31.9	31.2	32.0	35.3
<i>Education</i>					
Completed less than 6 years of education	4.6	1.9	3.6	5.5	4.6
Between 6 and 12 years	10.6	16	21.7	12.4	10.9
Trade school or vocational training	9.9	6.6	15.7	10.5	10.0
Some university but no degree	17.9	19.8	13.3	22.1	18.0
University degree or more	57.0	55.7	45.8	49.4	56.5
<i>Marital status</i>					
Single	65.8	77.4	65.1	73.5	66.3
Married registered	9.6	3.8	7.2	5.2	9.3
Non-registered relation	20.2	13.2	10.8	13.5	19.7
Others	4.5	5.7	16.9	7.7	4.8
Consider oneself a member of an ethnic or racial minority=1	17.9	17.0	37.3	34.3	18.9
<i>Socioeconomic status</i>					
Lower	6.5	7.5	15.7	11.9	6.9
Lower middle	35.8	40.6	43.4	50.0	36.7
Upper middle	51.5	46.2	37.3	32.9	50.4
Upper	6.1	5.7	3.6	5.2	6.0
<i>Place of residence</i>					
Rural or Farm or Isolated house	5.3	7.5	7.2	8.3	5.5
Small city or town or suburb	24.7	40.6	31.3	24.6	25.0
Large or capital city	70.0	51.9	61.4	67.1	69.5
Has citizenship or valid residence permit=1	93.8	94.3	94.0	96.1	94.0
Household live has outdoor spaces=1	75.7	80.2	73.5	76.2	75.7
Average of log of GDP per capita ^a	10.2	10.6	10.0	10.0	10.2
<i>Regions</i>					
South Asia, East Asia, and Pacific	11.0	9.4	20.5	35.1	12.2
Europe and Central Asia	72.8	54.7	51.8	43.4	70.8
Latin America and the Caribbean	9.2	0.9	3.6	8.0	9.0
Middle East and North Africa	3.8	0.9	15.7	5.5	3.9
North America	2.5	22.6	7.2	3.6	2.9
Sub Saharan Africa	0.9	11.3	1.2	4.4	1.2

	(1)	(2)	(3)	(4)	(5)
	Cismen	Ciswomen	Transgender	Non-binary	All
Observations	6,876	106	83	362	7,427

Note: ^a The data is collected from World Development Indicators. To compute GDP per capita income for the country 'United Kingdom and Northern Ireland,' we use the average GDP per capita income of Ireland and the United Kingdom. Besides, for the region Taiwan, we use the GDP per capita of China; ^b We define the regions following the World Bank's definition as East Asia and Pacific; Europe and Central Asia; South Asia; Latin America and the Caribbean; the Middle East and North Africa; North America; and Sub-Saharan Africa. However, due to South Asia's small sample of responses, the region is combined with East Asia and the Pacific.

2.2 Methodology

In this paper, we are interested in understanding the effect of the COVID-19 pandemic on the economic and mental well-being of cismen, ciswomen, transgender, and non-binary people. We estimate probit models to examine the impact of the pandemic on individuals' income, consumption, and experience of mental distress by their gender identities. In these probit estimates, the binary dependent variables focus on individuals' (1) expectation of losing jobs or being unemployed because of the COVID-19 crisis (conditional on having a job on the day of the survey interview),⁴ (2) expectation of income to reduce by at least 30 percent because of the COVID-19 crisis, (3) inability to meet basic consumption needs (e.g., food, clothing, shelter, transportation, education, and health care) with current income, (4) adjustment by cutting the size of meals since the COVID-19 crisis began, (5) receipt of any additional financial benefits from work or government because of the COVID-19 crisis, (6) expectation of losing health insurance coverage because of the COVID-19 crisis (conditional on had health insurance coverage on the day of the survey interview)⁵, (7) feeling of physical or emotional safety in the current living environment, and (8) feeling of loneliness since the beginning of the COVID-19 crisis.⁶

The probit model is as follows (model 1):

$$Y_i = \beta_0 + \beta_G G_i + \beta_X X_i + \varepsilon_i \quad Y_i^* = \mathbb{I}(Y_i^* > 0) \quad (1)$$

where, Y represents the dependent variables from (1)-(8) listed above; G is a categorical variable defining the gender identity of the individuals, cismen (=0, reference category), ciswomen (=1), transgender (=2), and non-binary people (=3); X represents a vector of the individual, household and regional characteristics, including: age and age-squared (lifecycle stage), levels of education, marital

⁴ As the indicator expect to lose job or be unemployed is conditional on having a job on the day of the survey interview, N for this indicator is 4,454 with cismen=4,140, ciswomen=54, transgender=54, and non-binary=206.

⁵ As the indicator expect to lose health insurance coverage is conditional on having health insurance on the day of the survey interview, N for this indicator is 5,952 with cismen=5,532, ciswomen=94, transgender=57, and non-binary=269.

⁶ Detailed descriptions of the dependent variables are provided in Appendix A, Table A1.

status, whether individual consider themselves a member of an ethnic or racial minority group, socioeconomic status (upper, upper middle, lower middle, or lower), place where individual lives (rural, small, or large city), whether individual has citizenship or a valid residence permit for the country in which they live, whether individual lives in a place with outdoor spaces during COVID-19, log of pre-pandemic GDP per capita of 2019, Purchasing Power Parity (PPP) (constant 2017 international \$), and regions (South Asia, East Asia and Pacific; Europe and Central Asia; Latin America and the Caribbean; Middle East and North Africa; North America; and Sub-Saharan Africa)⁷; and ε is a vector of errors.

Moreover, to understand the mental health of the respondents during the COVID-19 pandemic, an ordered probit model is estimated based on the anxiety and depression measure constructed using the Patient Health Questionnaire (PHQ-4) scale. For the ease of administering the survey over an app, the questionnaire includes standardized questions for constructing the PHQ-4 scale. PHQ-4 scale is used extensively in research and clinical settings as a general indicator for anxiety and depression. The advantage of the PHQ-4 over the other mental distress measurements is that it is an ultra-brief screener, which can be used to indicate whether individuals may benefit from a further in-depth assessment (Stanhope 2016).

The four standardized indicators used for constructing the PHQ-4 scales are: (1) feeling of depression or hopelessness over the last 2 weeks, (2) feeling of disinterest or displeasure over the last 2 weeks, (3) feeling of nervousness, anxiety, or on edge over the last 2 weeks, and (4) feeling of inability to stop or control worrying over the last 2 weeks. For each of the four indicators, the respondents were asked to score how often they were bothered by the problem: not at all (score 0), several days (1), more than half the days (2), and nearly every day (3). The total score for anxiety and depression in the full PHQ-

⁷ Because of the limited sample size, we use control of aggregated regions for estimations instead of countries. Using country-level control in the estimations reduces the sample size further as many country dummies get dropped during probit optimization. Note that, to check the sensitivity of the results, even with a small sample size constraining the empirical analysis, we attempt to estimate the probit models including country fixed effects instead of aggregated regions. We confirm that the results with country fixed effects are qualitatively similar and consistent with the findings presented in this paper.

4 scale is determined by adding together the scores of each of the 4 items. In the PHQ-4 scale, total scores are rated as: no psychological distress (score 0-2), mild psychological distress (3-5), moderate psychological distress (6-8), and severe psychological distress (9-12).

We estimate the ordered probit model as follows (model 2):

$$M_i^* = \beta_0 + \beta_G G_i + \beta_X X_i + \varepsilon_i \quad M_i = \begin{cases} 0 & \text{if } \mu_1 < M_i^* \leq \mu_0 \\ 1 & \text{if } \mu_0 < M_i^* \leq \mu_1 \\ 2 & \text{if } \mu_1 < M_i^* \leq \mu_2 \\ 3 & \text{if } \mu_2 < M_i^* \leq \mu_3 \end{cases} \quad (2)$$

where M represents the ordered dependent variable taking the value of 0 for no, 1 for mild, 2 for moderate, and 3 for severe psychological distress; μ 's represent threshold to be estimated; and vector G , X , and ε are defined above in model (1).

Additionally, for a detailed understanding of respondents' mental health during the pandemic, we estimate probit models similar to model (1) described above, where two dependent variables Y are constructed by splitting the PHQ-4 scale into two subscales: (1) anxiety subscale and (2) depression subscale. The anxiety subscale is constructed using the indicators - feeling of nervousness, anxiety or on edge, and feeling of inability to stop or control worrying over the last 2 weeks. The total score of summing these two anxiety indicators ranges from 0-6, where respondents are identified to have anxiety (=1) if the total score is 3 and above. Similarly, to construct the depression subscale, we use the two remaining PHQ indicators - feeling of depression or hopelessness and feeling of disinterest or displeasure over the last 2 weeks. Like the anxiety subscale, respondents are identified to be depressed (=1) if their total score of depression indicators is 3 and above.

Before moving forward to discussing the empirical findings, it is important to note that the analysis in this paper is severely constrained by (i) selection bias and (ii) the skewed and small sample size of ciswomen, transgender, and non-binary people. In other words, the sample consists of only the respondents who used the app and took the online survey and does not include the non-users of the app

and also those who did not take the survey. A person may not use the app because s/he may prefer not to use the app or s/he does not have access to the app for reasons such as lack of internet access, cannot afford a device to use the app, less educated, etc. Although the usual solutions to the selection problem consist of correcting for the bias through models like Heckman regression, this was not feasible in the paper because the survey does not include the non-users of the app. Furthermore, dating apps also tend to attract a particular segment of the population, such as those likely to be young, single, wealthy, and open-minded, introducing biases in online surveys (Castro et al. 2020; World Bank 2018).

Additionally, we expect bias in estimation presented in this paper without including controls for baseline conditions of the respondents before the pandemic. For instance, although the survey asks respondents about their status during the pandemic, it is not the same to find an increase in stress during the pandemic from a seriously anxious pre-pandemic state versus a stress-free pre-pandemic state. Similarly, expecting to lose a job during the pandemic for someone who never lost a job versus someone whose precarious job was frequently lost before the pandemic is also not the same.

Nevertheless, with the restricted analytical ability due to the small sample and the lack of data on non-users of the app and the non-participants of the survey, this paper attempts to understand the effect of the pandemic on transgender and non-binary people – who generally remain understudied due to a lack of existing data. Hence, the paper is primarily exploratory. Results presented in this paper must therefore be interpreted keeping in mind the limitations imposed by the survey design and the sample size.

3. Empirical Findings

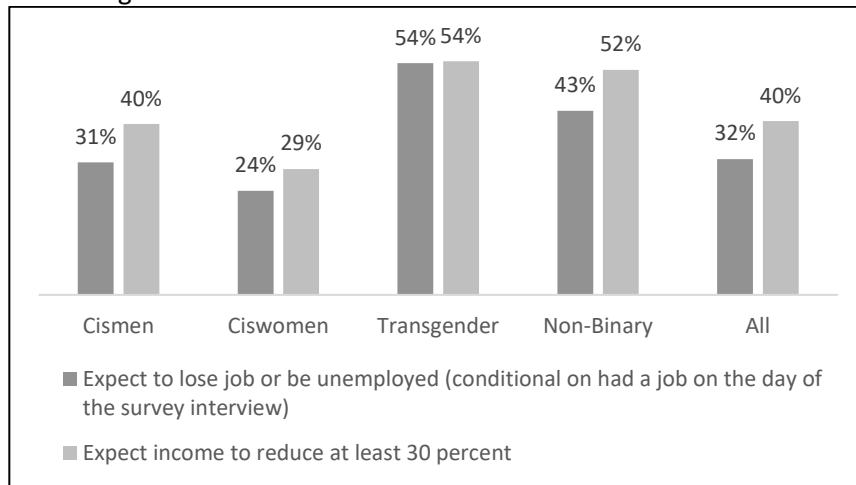
This section presents empirical findings under two headings to fully understand the effect of COVID-19 on income and consumption as well as the mental well-being of cismen, ciswomen, transgender, and non-binary people globally.⁸

3.1 *Impact of COVID-19 on Income and Consumption*

Transgender and non-binary people are disproportionately affected by the COVID-19 pandemic, with a higher percentage expecting the loss of employment and income than cismen and ciswomen. With the onset of the pandemic, many individuals lost their jobs and income, with emergency health measures limiting economic activities (Jackson et al. 2021). Figure 1 shows the percentage of respondents who expect to lose jobs (conditional on, had a job on the day of the survey interview) and respondents' expectations of their income to reduce by at least 30 percent. The analysis indicates that 31 percent of cismen and 24 percent of ciswomen reported expecting to lose their jobs or be unemployed, a figure well below 54 percent of transgender people reported expecting to lose their jobs in the pandemic (Figure 1). The marginal effects of the probit model in Table 3 suggest that the probability of transgender people expecting to lose their jobs is 13 percentage points higher than those of cismen, after controlling for individual, household, and regional characteristics.

⁸ As an alternative, we also run Generalized Maximum Entropy (GME) models for all the probit estimations presented in this paper with full control variables to check the consistency of the results. GME estimation provides an alternative to traditional methods. Instead of maximizing a likelihood function, the GME estimator re-parameterizes the model for the unknown parameters and errors taking the form of probabilities. It methodically selects the probability distribution that maximizes uncertainty remaining in the distribution, conditional on the information known about the distribution. Without making assumptions about the underlying distribution and estimating point estimate, GME considers them as the mean values of random variables and estimates their full distributions accordingly. GME specifies a structure for fitting models that are robust to poor specification and to data that are partial or incomplete (Corral, Kuehn, and Jabir 2017). The results are provided in Appendix B, Tables B1-B3. We confirm that the results are qualitatively similar and consistent with the findings presented here.

Figure 1: Expectation of Losing Job and Income



N=4454 for expect to lose job; and N=7427 for expect income to reduce at least 30 percent.

The disproportionate impact faced by transgender and non-binary people in relation to jobs is also reflected in their expectation of reduced income. More than half, 54 percent of transgender people and 52 percent of non-binary people expect their income to decline by at least 30 percent. However, compared to transgender and non-binary people, a much lower 40 percent of cismen and 29 percent of ciswomen expect the same (Figure 1). The marginal effects of the probit model estimation in Table 3 shows that non-binary people are 7 percentage points more likely to expect an income reduction of at least 30 percent due to the pandemic than cismen.

Nonetheless, one may reason that the expectation of economic loss does not necessarily reflect the actual loss of job and income. Using the COVID-19 Disparity Survey, it is not possible to infer the realized loss of jobs and income for transgender and non-binary people compared to cisgender people. In the absence of global evidence on the impact of COVID-19 on job loss of LGBTI people, we are unable to compare our results widely. The findings in this paper, however, are consistent with the existing empirical evidence on the US economy, suggesting that LGBTI people and their families experienced a higher rate of job and wage loss during the pandemic than non-LGBTI people (Movement Advancement Project 2020). In the US, LGBTI people were more likely to be laid off from their jobs and furloughed than non-LGBTI people (Sears, Conron, and Flores 2021).

Table 3. Marginal effects of the probit model: the probability of loss of income and health insurance coverage, reduction in consumption, and receipt of financial benefit from work or government

	(1)	(2)	(3)	(4)	(5)	(6)
	Expect to lose job or be unemployed=1 (conditional on had a job on the day of the survey interview)	Expect income to reduce at least 30 percent=1	Unable to meet basic needs=1	Cutting size of meals=1	Received any financial benefit from work or government =1	Expect to lose health insurance coverage=1 (conditional on had health insurance on the day of the survey interview)
<i>Ref: Cismen</i>						
Ciswomen	-0.031 (0.065)	-0.054 (0.049)	-0.058 (0.051)	-0.044 (0.033)	0.028 (0.034)	-0.033* (0.017)
Transgender	0.132* (0.072)	0.086 (0.057)	0.093 (0.062)	0.149*** (0.053)	0.062 (0.044)	0.124** (0.049)
Non-binary	0.059* (0.036)	0.070** (0.028)	-0.031 (0.027)	0.031 (0.021)	0.044** (0.020)	0.023 (0.015)
Age	0.005 (0.005)	0.008** (0.003)	0.009** (0.003)	0.005** (0.003)	0.004** (0.002)	0.004** (0.002)
Age-Squared	-0.0001* (0.0001)	-0.0001*** (0.00003)	-0.0001*** (0.00004)	-0.0001*** (0.00003)	-0.0001** (0.00002)	-0.0001*** (0.00002)
<i>Ref: Completed less than 6 years of education</i>						
Between 6 and 12 years	-0.081* (0.043)	0.041 (0.033)	0.018 (0.034)	-0.047 (0.029)	-0.009 (0.024)	0.012 (0.021)
Trade school or vocational training	-0.017 (0.044)	0.060* (0.033)	0.081** (0.035)	-0.012 (0.030)	0.0003 (0.025)	-0.011 (0.020)
Some university but no degree	-0.024 (0.041)	0.071** (0.031)	0.024 (0.032)	-0.084*** (0.028)	-0.0003 (0.023)	-0.017 (0.019)
University degree or more	-0.148*** (0.038)	-0.023 (0.029)	-0.042 (0.030)	-0.138*** (0.026)	-0.047** (0.022)	-0.021 (0.018)
<i>Ref: Single</i>						
Married registered	-0.006 (0.026)	0.007 (0.022)	-0.086*** (0.022)	-0.022 (0.017)	0.002 (0.015)	0.033** (0.014)
Non-registered relation	0.002	-0.011	0.006	-0.020*	-0.028***	-0.009

	(1)	(2)	(3)	(4)	(5)	(6)
	Expect to lose job or be unemployed=1 (conditional on had a job on the day of the survey interview)	Expect income to reduce at least 30 percent=1	Unable to meet basic needs=1	Cutting size of meals=1	Received any financial benefit from work or government =1	Expect to lose health insurance coverage=1 (conditional on had health insurance on the day of the survey interview)
Others	(0.019) 0.020 (0.035)	(0.015) 0.012 (0.028)	(0.016) 0.022 (0.029)	(0.011) 0.0004 (0.021)	(0.010) -0.008 (0.019)	(0.007) 0.025 (0.016)
Consider oneself a member of an ethnic or racial minority=1 <i>Ref: Socioeconomic status: Lower</i>	0.072*** (0.018)	0.054*** (0.015)	0.018 (0.016)	0.074*** (0.011)	0.007 (0.010)	0.029*** (0.007)
Lower middle	-0.212*** (0.035)	-0.137*** (0.024)	-0.234*** (0.021)	-0.225*** (0.024)	-0.018 (0.017)	-0.036** (0.017)
Upper middle	-0.395*** (0.034)	-0.270*** (0.024)	-0.583*** (0.020)	-0.360*** (0.024)	-0.021 (0.017)	-0.057*** (0.017)
Upper <i>Ref: Rural or Farm or Isolated house</i>	-0.425*** (0.041)	-0.295*** (0.032)	-0.661*** (0.026)	-0.327*** (0.029)	-0.036 (0.022)	-0.054*** (0.020)
Small city or town or suburb	-0.052 (0.035)	-0.031 (0.028)	0.045 (0.029)	0.020 (0.019)	-0.027 (0.019)	0.023** (0.012)
Large or capital city	-0.009 (0.034)	0.035 (0.027)	0.031 (0.028)	0.037** (0.018)	-0.031* (0.019)	0.020* (0.011)
Has citizenship or valid residence permit=1	0.050*** (0.016)	0.012 (0.013)	0.001 (0.014)	-0.013 (0.010)	-0.006 (0.008)	-0.006 (0.006)
Household live has outdoor spaces=1	-0.065*** (0.017)	-0.026* (0.014)	-0.060*** (0.014)	-0.059*** (0.010)	0.043*** (0.010)	-0.021*** (0.006)
Log of GDP per capita	-0.170*** (0.020)	-0.146*** (0.016)	-0.184*** (0.017)	-0.074*** (0.012)	0.076*** (0.011)	-0.044*** (0.009)
<i>Ref: South Asia, East Asia, and Pacific</i>						
Europe and Central Asia	0.142*** (0.021)	0.060*** (0.019)	0.142*** (0.019)	-0.022 (0.015)	-0.173*** (0.018)	-0.055*** (0.013)
Latin America and the Caribbean	-0.048** (0.024)	0.074*** (0.026)	-0.120*** (0.021)	-0.076*** (0.018)	-0.074*** (0.023)	-0.032** (0.015)

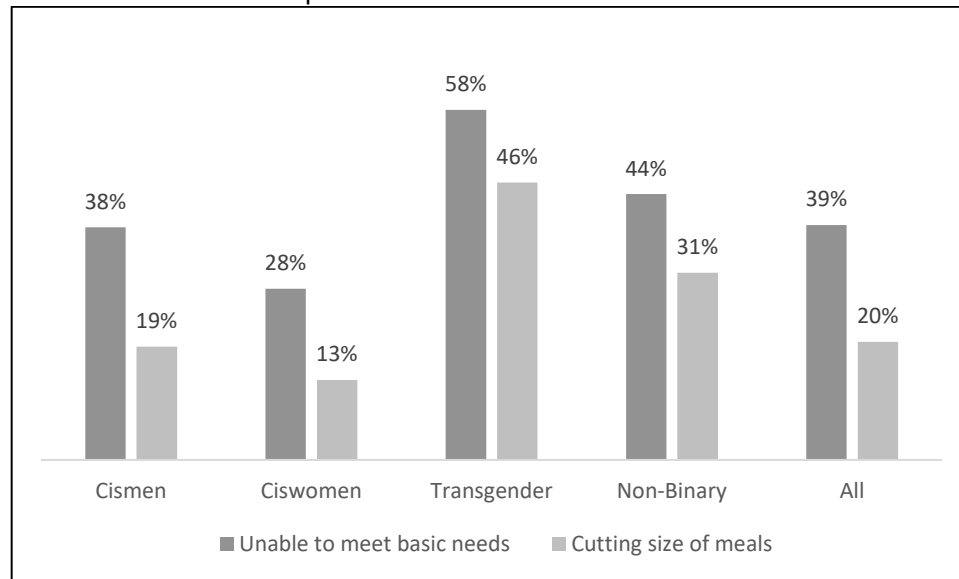
	(1)	(2)	(3)	(4)	(5)	(6)
	Expect to lose job or be unemployed=1 (conditional on had a job on the day of the survey interview)	Expect income to reduce at least 30 percent=1	Unable to meet basic needs=1	Cutting size of meals=1	Received any financial benefit from work or government =1	Expect to lose health insurance coverage=1 (conditional on had health insurance on the day of the survey interview)
Middle East and North Africa	0.110*** (0.039)	0.065* (0.034)	0.174*** (0.036)	0.045 (0.028)	-0.131*** (0.027)	-0.059*** (0.016)
North America	0.196*** (0.059)	0.106** (0.043)	0.017 (0.044)	0.010 (0.038)	-0.007 (0.038)	-0.081*** (0.020)
Sub Saharan Africa	-0.096** (0.042)	0.060 (0.056)	-0.008 (0.050)	0.047 (0.047)	-0.086* (0.049)	-0.055** (0.025)
Observations	4,454	7,427	7,427	7,427	7,427	5,952
Pseudo-R ²	0.1301	0.0576	0.1919	0.1432	0.0549	0.0953

Note: *** 1%, ** 5%, and * 10% level of significance.

Besides, although the actual loss of jobs and income cannot be empirically assessed in this paper, the analysis on consumption indirectly captures such possibility, with transgender and non-binary respondents disproportionately reporting being unable to meet their basic needs during the pandemic than cisgender people. The analysis of the impact of the COVID-19 pandemic on people's consumption suggests that a large share of transgender and non-binary people resorted to cutting the size of meals to cope with economic strains imposed by the pandemic. Generally, LGBTI people have fewer economic opportunities than their counterparts and are likely to live in poverty (SOGI Task Force and Koehler 2015; Kattari et al. 2016; Conron, Goldberg, and Halpern 2018; Ojanen et al. 2019). In that case, this public health crisis may worsen such prevailing disparities by causing further declines in the consumption of transgender and non-binary people.

The findings in this paper indicate that a considerably high percentage, 58 percent, of transgender people reported being unable to meet their basic needs, and 46 percent reported cutting the size of their meals (Figure 2). Similarly, 44 percent of the non-binary people reported being unable to meet their basic needs, and 31 percent reported cutting their meal size. In comparison, a lower percentage, 38 and 19 percent of cismen and 28 and 13 percent of ciswomen, reported being unable to meet their basic needs and having cut their size of meals, respectively (Figure 2). The marginal effects of the probit model in Table 3 indicate that the probability of transgender people cutting their meal size is 15 percentage points higher than those of cismen, controlling for individual, household, and regional characteristics.

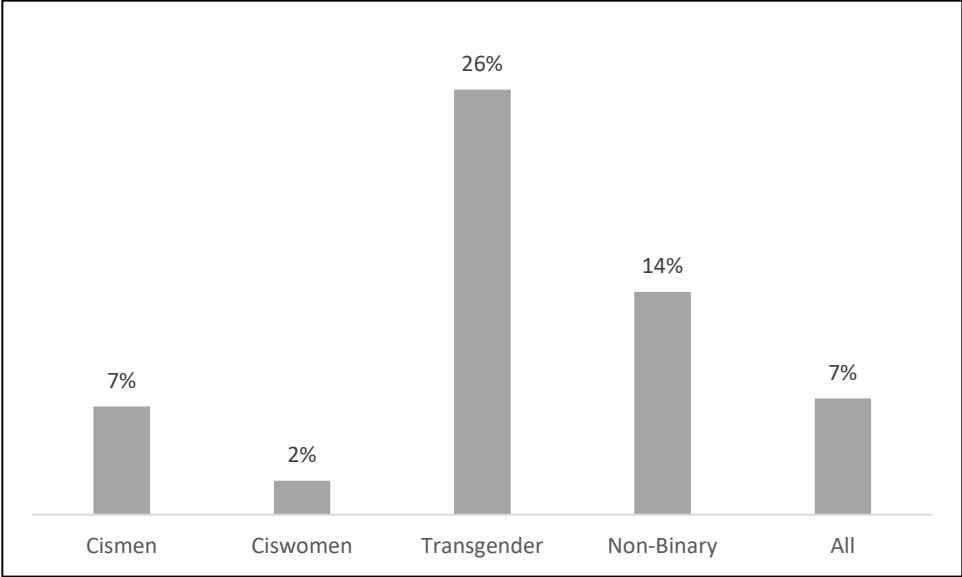
Figure 2. Impact of COVID-19 on consumption



N=7427.

The expectation of losing health insurance is another factor that is disproportionately higher among transgender people than their counterparts. Loss of health insurance puts the health of individuals at risk and exposes them to catastrophic spending on health, which may exacerbate economic strains. Access to health care services for transgender people might be disproportionately affected by the pandemic, with 26 percent of transgender people reported expecting to lose their health insurance coverage in the pandemic (Figure 3). A comparatively high percentage of non-binary people (14 percent) also report expecting to lose their health insurance compared to 7 percent of cismen and 2 percent of ciswomen expecting the same. The marginal effects of the probit model in Table 3 highlight that after controlling for individual, household, and regional characteristics, the probability of transgender people expecting to lose their health insurance coverage during the pandemic is 12 percentage points higher than those of cismen.

Figure 3: Expectation of losing health insurance coverage (conditional on had health insurance on the day of the survey interview)



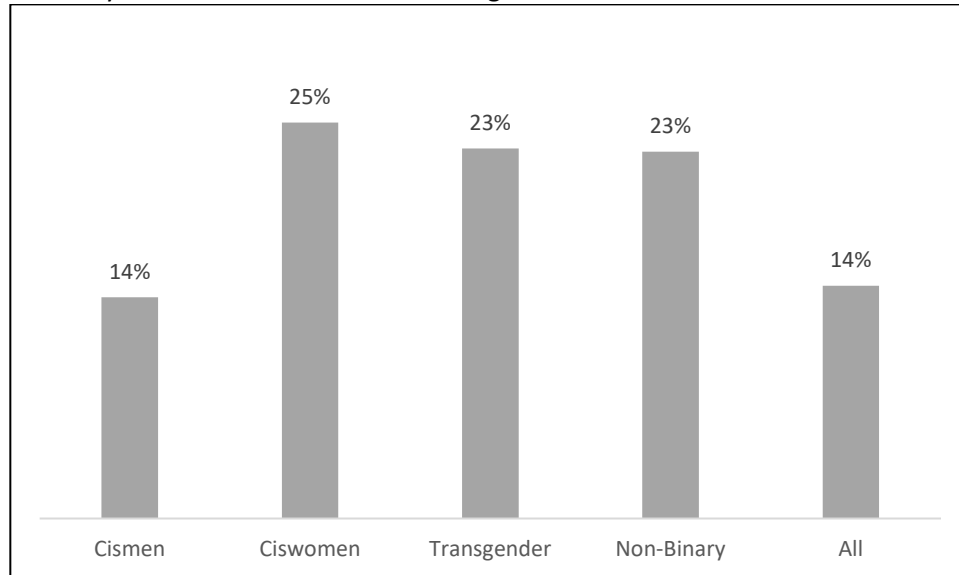
N=5952.

In relation to the decrease in income and consumption, financial benefits from work or government are among the essential coping strategies that have been adopted to mitigate the economic impacts of COVID-19. Governments across the world have stepped up to help the disadvantaged by widening the scope and reach of fiscal supports (Organisation for Economic Co-operation and Development 2021; International Monetary Fund, n.d.). The data indicates that 23 percent of each group, transgender and non-binary people, reported receiving financial support from work or the government due to the crisis. In comparison, 14 percent of cismen reported receiving financial support (Figure 4).

Nonetheless, the higher rate of transgender and non-binary people receiving financial support is not surprising. They generally are overrepresented in lower-income groups (see Table 2) and experienced elevated expectations of losing jobs and income compared to cismen, and consequently reported a decrease in consumption during the COVID-19 pandemic. The findings from the probit model estimations in Table 3 indicate that, after controlling for individual, household, and regional characteristics, non-binary people are 4 percentage points more likely to report receiving financial benefits from work or government due to the COVID-19 pandemic compared to cismen. However, the monetary support received by

transgender and non-binary people during the pandemic may not be enough to offset the growing economic hardships experienced by this community, which continues to face systemic barriers to employment and social protection.

Figure 4. Recipient of any financial benefit from work or government

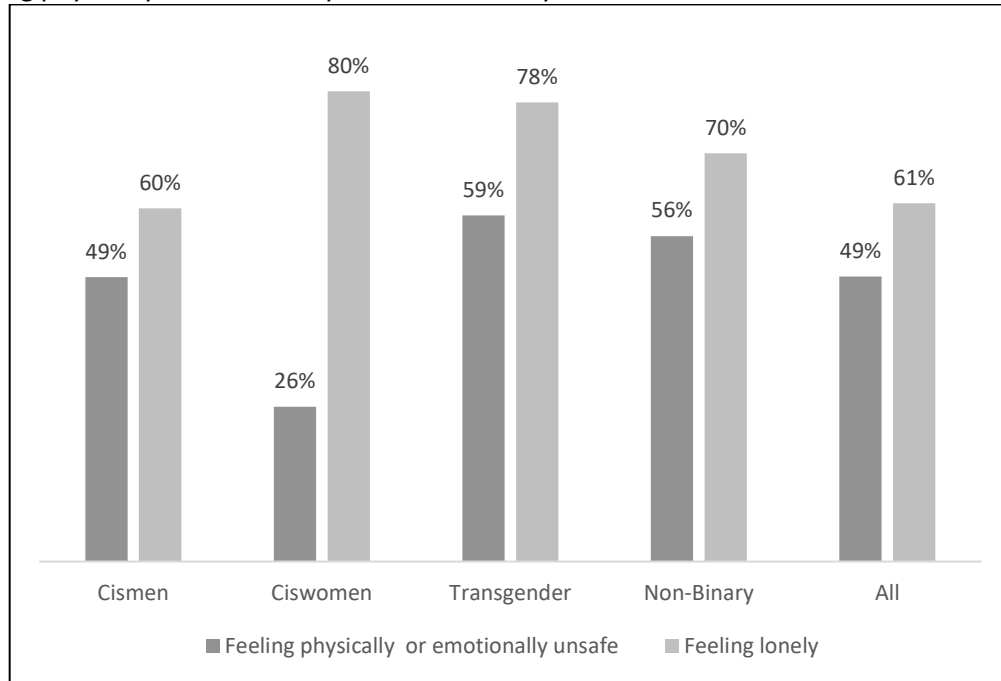


N=7427.

3.2 Impact of COVID-19 on Mental Health

Along with the expected reduction in income and tightening of expenditure, the findings in this paper show that transgender and non-binary people feel a higher degree of physical or emotional insecurity in their current environment relative to cisgender individuals. More than half of transgender and non-binary respondents reported feeling physically or emotionally unsafe during the pandemic compared to 49 percent of cismen and 26 percent of ciswomen (Figure 5). The marginal effects in the probit model in Table 4, controlling for individual, household, and regional characteristics, indicate that non-binary people are 8 percentage points more likely to feel physically or emotionally unsafe in their current environments than cismen.

Figure 5. Feeling physically or emotionally unsafe and lonely



N=7427.

In addition to feeling physically or emotionally insecure, transgender and non-binary people also reported experiencing high rates of loneliness during the pandemic. The imposition of physical social distancing measures to curb the pandemic has also resulted in social isolation of many individuals and caused mental distress (Kämpfen 2020; Leach et al. 2021). Respondents were asked whether they had been feeling lonely since the beginning of COVID-19. Regardless of gender identity, a considerably high number, 61 percent, reported experiencing loneliness since the beginning of the pandemic (Figure 5).

Transgender and non-binary people as well as ciswomen, however, reported experiencing a higher rate of loneliness than cismen. In fact, 78 percent of transgender people and 70 percent of non-binary people reported feeling lonely since the beginning of COVID-19. Interestingly, the analysis shows that a significantly high percentage of ciswomen also reported feeling lonely (80 percent) since the COVID-19 outbreak. Compared to all the groups, only 60 percent of cismen reported feeling lonely (Figure 5). The

marginal effects shown in Table 4 suggest that the probability of transgender people experiencing loneliness since the COVID-19 outbreak is 14 percentage points higher than those of cismen. Similarly, the marginal effects show that the probability of non-binary people experiencing loneliness is 7 percentage points higher than cismen, controlling for individual, household, and regional characteristics. The marginal effects of the probit model in Table 4 also indicate that ciswomen are 17 percentage points more likely to feel lonely since the COVID-19 outbreak compared to cismen.

Table 4. Marginal effects of the probit model: the probability of feeling physically or emotionally unsafe and loneliness

	(1)	(2)
	Feeling physically or emotionally unsafe=1	Feeling lonely =1
<i>Ref: Cismen</i>		
Ciswomen	-0.140*** (0.051)	0.168*** (0.044)
Transgender	0.050 (0.060)	0.141*** (0.050)
Non-binary	0.079*** (0.029)	0.067** (0.027)
Age	-0.007** (0.003)	-0.009*** (0.003)
Age-Squared	0.00001 (0.00004)	0.0001** (0.00003)
<i>Ref: Completed less than 6 years of education</i>		
Between 6 and 12 years	0.042 (0.034)	-0.004 (0.032)
Trade school or vocational training	0.043 (0.035)	-0.028 (0.033)
Some university but no degree	0.043 (0.032)	0.001 (0.030)
University degree or more	0.014 (0.030)	-0.003 (0.028)
<i>Ref: Single</i>		
Married registered	-0.131*** (0.022)	-0.126*** (0.021)
Non-registered relation	0.009 (0.016)	-0.156*** (0.015)
Others	-0.001 (0.029)	-0.074*** (0.027)
Consider oneself a member of an ethnic or racial minority=1	0.087*** (0.016)	0.065*** (0.015)
<i>Ref: Socioeconomic status: Lower</i>		

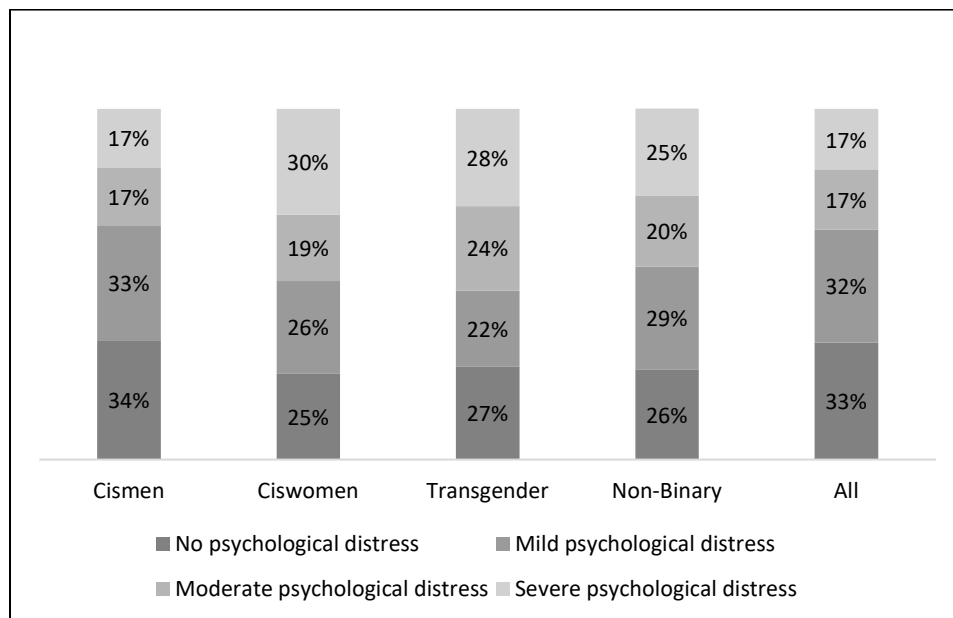
	(1)	(2)
	Feeling physically or emotionally unsafe=1	Feeling lonely =1
Lower middle	-0.113*** (0.024)	-0.025 (0.024)
Upper middle	-0.236*** (0.024)	-0.072*** (0.023)
Upper	-0.295*** (0.034)	-0.067** (0.033)
<i>Ref: Rural or Farm or Isolated house</i>		
Small city or town or suburb	0.062** (0.030)	0.016 (0.027)
Large or capital city	0.074*** (0.028)	0.013 (0.026)
Has citizenship or valid residence permit=1	0.029** (0.014)	0.024** (0.012)
Household live has outdoor spaces=1	-0.114*** (0.014)	-0.067*** (0.014)
Log of GDP per capita	-0.192*** (0.017)	-0.010 (0.016)
<i>Ref: South Asia, East Asia, and Pacific</i>		
Europe and Central Asia	0.339*** (0.017)	0.070*** (0.020)
Latin America and the Caribbean	0.237*** (0.025)	-0.011 (0.026)
Middle East and North Africa	0.426*** (0.034)	0.146*** (0.033)
North America	0.142*** (0.044)	0.140*** (0.040)
Sub Saharan Africa	0.040 (0.048)	0.070 (0.057)
Observations	7,427 0.1227	7,427 0.0368

Note: *** 1%, ** 5%, and * 10% level of significance.

Lastly, the cutback in consumption and feelings of insecurity and loneliness are likely correlated with the heightened anxiety and depression experienced by individuals. The analysis of the full PHQ-4 scale shows that compared to cisgender men, the other groups experienced a higher rate of moderate to severe psychological distress during the pandemic. More than half of the transgender people reported feeling moderate to severe psychological distress over the last 2 weeks from their survey interviews (Figure 6). For non-binary people, an equally high percentage, 45 percent, experienced moderate to severe

psychological distress. Consistent with the findings of a higher percentage of ciswomen feeling lonely among all, the results on anxiety and depression over the last 2 weeks also show that the highest number of ciswomen, 30 percent, identified experiencing severe psychological distress. In comparison, only 17 percent of cismen experienced moderate distress, and an equal percentage also experienced severe psychological distress over the last 2 weeks. The marginal effects of the ordered probit models in Table 5 reveal that non-binary people are 2 percentage points more likely to experience moderate psychological distress. Consistently, non-binary people are also 5 percentage points more likely to experience severe psychological distress than cismen in the last 2 weeks. Additionally, ciswomen are 3 and 8 percentage points more likely to experience moderate and severe psychological distress compared to cismen, respectively.

Figure 6. Psychological distress over the last 2 weeks from the respective survey (based on full PHQ-4 scale)

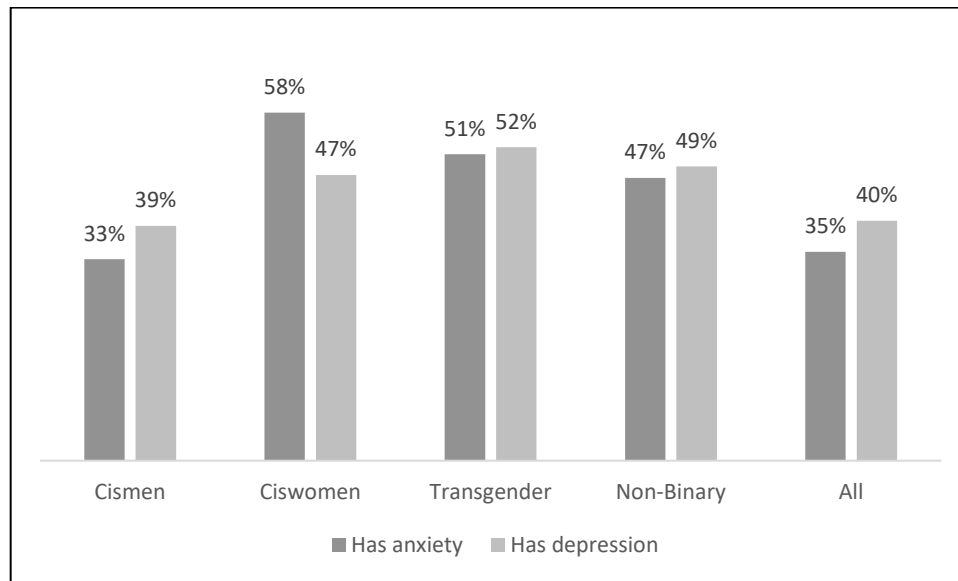


N=7427.

A closer look at the two subscales of the full PHQ-4 scale for anxiety and depression reveals a higher rate of anxiety as well as depression among non-binary people than cismen. Fifty-six percent of

non-binary people identified experiencing anxiety. The rate identified experiencing depression is even higher - 70 percent of non-binary people experienced depression, which is comparatively low among cismen (60 percent) (Figure 7). Similarly, a considerably high percentage, 58 percent, of ciswomen identified experiencing anxiety in the last two weeks. Consistent with the results on psychological distress with the full PHQ-4 scale, the marginal effects of the probit model shown in Table 5 indicate that non-binary people are 9 percentage points more likely to have experienced anxiety in the last 2 weeks compared to cismen. The marginal effects of the probit model for the depression subscale suggest that non-binary people are 5 percentage points more likely to have experienced depression than cismen in the last 2 weeks. Additionally, the results also highlight that the probability of ciswomen experiencing anxiety in the last 2 weeks is 20 percentage points higher than those of cismen.

Figure 7. Anxiety and depression over the last 2 weeks from the respective survey (based on PHQ subscale)



N=7427.

Table 5. Marginal effects of the ordered probit and probit models: the probability of psychological distress (anxiety and depression) over the last 2 weeks of survey (based on PHQ scale)

	Ordered Probit Estimation (full scale)				Probit Estimation	
	(1)	(2)	(3)	(4)	(5)	(6)
	No psychological distress	Mild psychological distress	Moderate psychological distress	Severe psychological distress	Has anxiety (Subscale)	Has depression (Subscale)
<i>Ref: Cismen</i>						
Ciswomen	-0.095*** (0.034)	-0.013 (0.010)	0.031*** (0.010)	0.077** (0.033)	0.204*** (0.052)	0.041 (0.051)
Transgender	-0.044 (0.041)	-0.003 (0.005)	0.015 (0.014)	0.032 (0.033)	0.082 (0.057)	0.036 (0.057)
Non-binary	-0.064*** (0.020)	-0.006 (0.004)	0.022*** (0.006)	0.048*** (0.017)	0.094*** (0.028)	0.054* (0.028)
Age	0.010*** (0.002)	0.0002 (0.0001)	-0.004*** (0.001)	-0.007*** (0.002)	-0.010*** (0.003)	-0.014*** (0.003)
Age-Squared	-0.0001** (0.00003)	-0.00001 (0.000001)	0.00002* (0.00001)	0.00004** (0.00002)	0.00004 (0.00004)	0.0001** (0.00004)
<i>Ref: Completed less than 6 years of education</i>						
Between 6 and 12 years	-0.020 (0.025)	-0.001 (0.001)	0.007 (0.009)	0.014 (0.017)	0.031 (0.032)	0.042 (0.033)
Trade school or vocational training	-0.006 (0.026)	-0.0002 (0.001)	0.002 (0.009)	0.004 (0.018)	-0.016 (0.032)	0.018 (0.033)
Some university but no degree	-0.011 (0.024)	-0.0004 (0.001)	0.004 (0.008)	0.008 (0.016)	-0.016 (0.030)	0.021 (0.031)
University degree or more	0.014 (0.022)	0.00001 (0.001)	-0.005 (0.008)	-0.009 (0.015)	-0.021 (0.028)	-0.005 (0.029)
<i>Ref: Single</i>						
Married registered	0.056*** (0.018)	-0.001 (0.001)	-0.020*** (0.006)	-0.036*** (0.010)	-0.040* (0.021)	-0.096*** (0.021)
Non-registered relation	0.053*** (0.012)	-0.001 (0.001)	-0.018*** (0.004)	-0.034*** (0.007)	-0.037** (0.015)	-0.063*** (0.015)
Others	0.005 (0.021)	0.0002 (0.001)	-0.002 (0.007)	-0.003 (0.015)	0.001 (0.027)	-0.004 (0.028)
	-0.077***	-0.001	0.027***	0.052***	0.083***	0.077***

	Ordered Probit Estimation (full scale)				Probit Estimation	
	(1)	(2)	(3)	(4)	(5)	(6)
	No psychological distress	Mild psychological distress	Moderate psychological distress	Severe psychological distress	Has anxiety (Subscale)	Has depression (Subscale)
Consider oneself a member of an ethnic or racial minority=1 <i>Ref: Socioeconomic status: Lower</i>	(0.012)	(0.001)	(0.004)	(0.008)	(0.014)	(0.015)
Lower middle	0.125*** (0.014)	0.044*** (0.008)	-0.034*** (0.003)	-0.134*** (0.018)	-0.148*** (0.025)	-0.167*** (0.024)
Upper middle	0.210*** (0.014)	0.044*** (0.008)	-0.064*** (0.004)	-0.190*** (0.018)	-0.238*** (0.024)	-0.283*** (0.024)
Upper <i>Ref: Rural or Farm or Isolated house</i>	0.231*** (0.024)	0.042*** (0.008)	-0.072*** (0.008)	-0.201*** (0.021)	-0.236*** (0.032)	-0.291*** (0.033)
Small city or town or suburb	0.014 (0.021)	0.001 (0.001)	-0.005 (0.007)	-0.010 (0.015)	-0.00003 (0.027)	-0.003 (0.028)
Large or capital city	0.021 (0.020)	0.001 (0.001)	-0.007 (0.007)	-0.015 (0.015)	-0.014 (0.026)	-0.007 (0.027)
Has citizenship or valid residence permit=1	-0.017* (0.010)	-0.0002 (0.0003)	0.006* (0.003)	0.012* (0.007)	0.015 (0.013)	0.049*** (0.013)
Household live has outdoor spaces=1	0.079*** (0.011)	0.001 (0.001)	-0.027*** (0.004)	-0.053*** (0.007)	-0.065*** (0.013)	-0.081*** (0.014)
Log of GDP per capita <i>Ref: South Asia, East Asia, and Pacific</i>	0.026** (0.012)	0.0004 (0.0004)	-0.009** (0.004)	-0.017** (0.008)	-0.024 (0.015)	-0.039** (0.016)
Europe and Central Asia	-0.176*** (0.017)	0.024*** (0.005)	0.061*** (0.006)	0.091*** (0.007)	0.129*** (0.017)	0.170*** (0.018)
Latin America and the Caribbean	-0.136*** (0.022)	0.024*** (0.005)	0.047*** (0.008)	0.064*** (0.012)	0.183*** (0.025)	0.095*** (0.024)
Middle East and North Africa	-0.283*** (0.023)	-0.001 (0.010)	0.095*** (0.007)	0.190*** (0.022)	0.285*** (0.033)	0.277*** (0.034)
North America	-0.192*** (0.033)	0.022*** (0.005)	0.067*** (0.011)	0.103*** (0.023)	0.222*** (0.042)	0.191*** (0.042)
Sub Saharan Africa	-0.256*** (0.039)	0.009 (0.013)	0.087*** (0.012)	0.160*** (0.038)	0.237*** (0.058)	0.238*** (0.059)

	Ordered Probit Estimation (full scale)				Probit Estimation	
	(1)	(2)	(3)	(4)	(5)	(6)
	No psychological distress	Mild psychological distress	Moderate psychological distress	Severe psychological distress	Has anxiety (Subscale)	Has depression (Subscale)
Observations	7,427	7,427	7,427	7,427	7,427	7,427
Pseudo-R ²	0.0466	0.0466	0.0466	0.0466	0.0670	0.0825

Note: *** 1%, ** 5%, and * 10% level of significance.

4. Conclusion

LGBTI people are already among the world's most disadvantaged. Any disproportionate impact of the COVID-19 pandemic on LGBTI people will deepen existing disparities and risk undercutting social advancements in reducing discrimination and exclusion. The findings in this paper suggest that transgender and non-binary people are disproportionately affected by the COVID-19 pandemic compared to cismen. The results show that transgender people expect to lose their jobs, consequently expecting to have reduced consumption and lose their health insurance more than cismen. Furthermore, non-binary people specifically experienced psychological distress at higher rates than cismen during the COVID-19 pandemic.

These findings present some important trends that need to be considered in ongoing COVID-19 recovery efforts. The results call for comprehensive targeted safety net programs and explicit protections from discrimination for gender minorities to ensure an inclusive and resilient recovery. Pre-emptive and multi-level interventions that target the unique needs of LGBTI people, and especially transgender and non-binary people, are essential for post-pandemic economic revival. In addition, recovery policies and programmatic interventions need to consider psychosocial support programs to mitigate any negative mental health impact of the pandemic on individuals.

Finally, this paper serves to showcase the use of survey data collected through mobile apps such as Hornet as they offer valuable and unique information on the lived experiences of marginalized communities that may be difficult to reach otherwise, particularly in crisis situations. Similar surveys should continue to be piloted to further research on disparities and challenges faced by LGBTI people and to inform evidence-based inclusive policies.

References

- Banerjee, Debanjan, and Vasundhara S. Nair. 2020. "The untold side of COVID-19": Struggle and perspectives of the sexual minorities." *Journal of Psychosexual Health* 2(2): 113-120.
- Badgett, M. V., Soon Kyu Choi, and Bianca DM Wilson. 2019. "LGBT poverty in the United States: A study of differences between sexual orientation and gender identity groups." School of Law Williams Institute: University of California, Los Angeles.
- Bishop, Amie. 2020. *Vulnerability amplified: The impact of the COVID-19 pandemic on LGBTIQ people*. OutRight Action International.
- Blake, Paul and Divyanshi Wadhwa. 2020. "2020 Year in Review: The impact of COVID-19 in 12 charts. Voices." *In Blog on Voices*. Washington, D.C.: World Bank Group. <https://blogs.worldbank.org/voices/2020-year-review-impact-covid-19-12-charts>
- Castro, Ángel, Juan Ramón Barrada, Pedro J. Ramos-Villagrasa, and Elena Fernández-del-Río. 2020. "Profiling dating apps users: Sociodemographic and personality characteristics." *International Journal of Environmental Research and Public Health* 17(10): 3653.
- Conron, Kerith J., Shoshana K. Goldberg, and Carolyn T. Halpern. 2018. "Sexual orientation and sex differences in socioeconomic status: a population-based investigation in the National Longitudinal Study of Adolescent to Adult Health." *J Epidemiol Community Health* 72(11): 1016-1026.
- Corral, Paul, Daniel Kuehn, and Ermengarde Jabir. 2017. "Generalized maximum entropy estimation of linear models." *The Stata Journal* 17(1): 240-249.
- Dang, Hai-Anh H., and Cuong Viet Nguyen. 2021. "Gender inequality during the COVID-19 pandemic: Income, expenditure, savings, and job loss." *World Development* 140: 105296.
- Flores, Andrew R., Lynn Langton, Ilan H. Meyer, and Adam P. Romero. 2020. "Victimization rates and traits of sexual and gender minorities in the United States: Results from the National Crime Victimization Survey, 2017." *Science Advances* 6(40): eaba6910.
- Gato, Jorge, Jaime Barrientos, Fiona Tasker, Marina Miscioscia, Elder Cerqueira-Santos, Anna Malmquist, Daniel Seabra et al. 2021. "Psychosocial effects of the COVID-19 pandemic and mental health among LGBTQ+ young adults: a cross-cultural comparison across six nations." *Journal of Homosexuality* 68(4): 612-630.
- International Monetary Fund. n.d. "Policy Tracker." In Policy Responses to COVID-19. <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>
- Jackson, James K., Rebecca M. Nelson, Martin A. Weiss, Karen M. Sutter, Andres B. Schwarzenberg, Michael D. Sutherland. 2021. "Global Economic Effects of COVID-19." Washington D.C.: Congressional Research Service.

- Jarrett, Brooke A., Sarah M. Peitzmeier, Arjee Restar, Tyler Adamson, Sean Howell, Stefan Baral, and S. Wilson Beckham. 2020. "Gender-affirming care, mental health, and economic stability in the time of COVID-19: a global cross-sectional study of transgender and non-binary people." *MedRxiv*.
- Kämpfen, Fabrice, Iliana V. Kohler, Alberto Ciancio, Wändi Bruine de Bruin, Jürgen Maurer, and Hans-Peter Kohler. 2020. "Predictors of mental health during the Covid-19 pandemic in the US: Role of economic concerns, health worries and social distancing." *PLOS One* 15(11): e0241895.
- Kattari, Shanna K., Darren L. Whitfield, N. Eugene Walls, Lisa Langenderfer-Magruder, and Daniel Ramos. 2016. "Policing gender through housing and employment discrimination: comparison of discrimination experiences of transgender and cisgender LGBTQ individuals." *Journal of the Society for Social Work and Research* 7(3): 427-447.
- Koehler, Dominik, Georgia Harley, Nicholas Menzies, and Runyararo Gladys Senderayi. 2017. *Discrimination against sexual minorities in education and housing: evidence from two field experiments in Serbia*. Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/161011522071811826/Discrimination-against-sexual-minorities-in-education-and-housing-evidence-from-two-field-experiments-in-Serbia>
- Leach, Corinne R., Erika Rees-Punia, Christina C. Newton, Sicha Chantaprasopsuk, Alpa V. Patel, and J. Lee Westmaas. 2021. "Stressors and other pandemic-related predictors of prospective changes in psychological distress." *The Lancet Regional Health-Americas* 4: 100069.
- Movement Advancement Project. 2020. "The Disproportionate Impacts of COVID-19 on LGBTQ Households in the US: Results from a July/August 2020 National Poll." <https://www.lgbtmap.org/file/2020-covid-lgbtq-households-report.pdf>
- Ojanen, Timo T., James Burford, Adisorn Juntrasook, Athita Kongsup, Titikarn Assatarakul, and Nada Chaiyajit. 2019. "Intersections of LGBTI exclusion and discrimination in Thailand: the role of socio-economic status." *Sexuality Research and Social Policy* 16(4): 529-542.
- Organisation for Economic Co-operation and Development. 2021. "The Territorial Impact of COVID-19: Managing the Crisis and Recovery across Levels of Government." <https://www.oecd.org/coronavirus/policy-responses/the-territorial-impact-of-covid-19-managing-the-crisis-and-recovery-across-levels-of-government-a2c6abaf/>
- Santos, Glenn-Milo, Benjamin Ackerman, Amrita Rao, Sara Wallach, George Ayala, Erik Lamontage, Alex Garner et al. 2021. "Economic, mental health, HIV prevention and HIV treatment impacts of COVID-19 and the COVID-19 response on a global sample of cisgender gay men and other men who have sex with men." *AIDS and Behavior* 25(2): 311-321.
- Sears, Brad, Kerith J. Conron, and Andrew R. Flores. 2021. "The Impact of the Fall 2020 COVID-19 Surge on LGBT Adults in the US." School of Law Williams Institute: University of California, Los Angeles.
- Sexual Orientation and Gender Identity Task Force (SOGI) and Dominik Koehler. 2015. "LGBTI people are (likely) overrepresented in the bottom 40%." *In Blog on Governance for Development*. Washington, D.C.: World Bank Group. <https://blogs.worldbank.org/governance/lgbti-people-are-likely-over-represented-bottom-40>

Stanhope, Jessica. 2016. "Patient health questionnaire-4." *Occupational Medicine* 66(9): 760-761.

United Nations Human Rights. 2020. "COVID-19 and the Human Rights of LGBTI People: What Is the Impact of COVID-19 on LGBTI People?" <https://www.ohchr.org/Documents/Issues/LGBT/LGBTIpeople.pdf>

Vindegard, Nina, and Michael Eriksen Benros. 2020. "COVID-19 pandemic and mental health consequences: Systematic review of the current evidence." *Brain, Behavior, and Immunity* 89: 531-542.

Whittington, Charlie, Katalina Hadfield, and Carina Calderón. 2020. "The Lives & Livelihoods of Many in the LGBTQ Community are at Risk Amidst COVID-19 Crisis." Human Rights Campaign Foundation.

World Bank. 2018. "Economic inclusion of LGBTI groups in Thailand." <https://openknowledge.worldbank.org/bitstream/handle/10986/37239/P16024902e7dc00520be0504196537d61c6.pdf?sequence=1&isAllowed=y>

"World Development Indicators." Washington, D.C.: The World Bank., n.d.

World Health Organizations. 2020. "Impact of COVID-19 on people's livelihoods, their health and our food systems." <https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems>

Appendix A

Table A1. Definition of the indicators used in the analysis

Indicators	Questions	Codes
Expect to lose job or be unemployed (conditional on had a job on the day of the survey interview)	Do you expect to lose your job or be unemployed because of the COVID-19 crisis?	Yes = 1 No = 0
Expect income to reduce at least 30 percent	How much are you expecting your income to reduce because of the COVID-19 crisis?	At least 30% (30 to 100%) =1 Less than 30% (0-29%) = 0
Unable to meet basic needs	How well are you able to meet your basic needs (e.g., food, clothing, shelter, transportation, education, and health care) with your current income?	Somewhat, Slightly, Not at all = 1 Very well; Fairly well = 0
Cutting size of meals	Since the COVID-19 crisis began, have you had to cut the size of your meals or skip meals because there was not enough money for food?	Yes = 1 No = 0
Expect to lose health insurance coverage (conditional on had health insurance on the day of the survey interview)	Do you expect to lose your health insurance coverage because of the COVID-19 crisis?	Probably yes; Definitely yes=1 Might or might not; Probably not; Definitely not=0
Recipient of any financial benefit from work or government	Are you receiving any additional financial benefits from work or government because of the COVID-19 crisis?	Yes, but it isn't needed; Yes, it is needed =1 No, it isn't needed; No, but it is needed; Not applicable in my country = 0
Feeling physically or emotionally unsafe	How do you feel about your current living environment? (Choose all that apply)	Feel physically or emotionally unsafe = 1 Feel physically and emotionally safe = 0
Feeling lonely	Have you been feeling lonely since the COVID-19 crisis began?	Yes, very much; Yes, a little bit = 1 No, not much; No, not at all = 0
Anxiety and depression (full PHQ-4 scale)	Over the last 2 weeks, how often have you been bothered by the following problems: feeling down, depressed or hopeless?	

Indicators	Questions	Codes
	Over the last 2 weeks, how often have you been bothered by the following problems: little interest or pleasure in doing things?	Add together the score of each of the 4 items based on responses: Not at all = 0; Several days=1; More than half the days=2; and Nearly every day=3. Mental health (depression and anxiety) PHQ-4 scale: 0: no psychological distress (total score 0-2) 1 mild psychological distress (total score 3-5) 2: moderate psychological distress (total score 6-8) 3: severe psychological distress (total score 9-12)
	Over the last 2 weeks, how often have you been bothered by the following problems: feeling nervous, anxious or on edge?	
	Over the last 2 weeks, how often have you been bothered by the following problems: not being able to stop or control worrying?	
Has anxiety (PHQ subscale)	Over the last 2 weeks, how often have you been bothered by the following problems: feeling nervous, anxious or on edge?	Add together the score of each of the 2 items based on responses: Not at all = 0; Several days=1; More than half the days=2; and Nearly every day=3. Anxiety subscale: 3 to 6: has anxiety = 1 0 to 2: no anxiety = 0
	Over the last 2 weeks, how often have you been bothered by the following problems: not being able to stop or control worrying?	
Has depression (PHQ subscale)	Over the last 2 weeks, how often have you been bothered by the following problems: feeling down, depressed or hopeless?	Add together the score of each of the 2 items based on responses: Not at all = 0; Several days=1; More than half the days=2; and Nearly every day=3. Depression subscale: 3 to 6: has depression = 1 0 to 2: no depression = 0
	Over the last 2 weeks, how often have you been bothered by the following problems: little interest or pleasure in doing things?	

Appendix B

Table B1. Marginal effects of the GME model: the probability of loss of income and health insurance coverage, reduction in consumption, and receipt of financial benefit from work or government

	(1)	(2)	(3)	(4)	(5)	(6)
	Expect to lose job or be unemployed=1 (conditional on had a job on the day of the survey interview)	Expect income to reduce at least 30 percent=1	Unable to meet basic needs=1	Cutting size of meals=1	Received any financial benefit from work or government =1	Expect to lose health insurance coverage=1 (conditional on had health insurance on the day of the survey interview)
<i>Ref: Cismen</i>						
Ciswomen	-0.030 (0.060)	-0.056 (0.048)	-0.051 (0.043)	-0.046 (0.035)	0.029 (0.033)	-0.039* (0.023)
Transgender	0.114* (0.062)	0.081 (0.054)	0.076 (0.049)	0.136*** (0.045)	0.066 (0.043)	0.124*** (0.046)
Non-binary	0.054* (0.031)	0.067** (0.026)	-0.024 (0.022)	0.028 (0.019)	0.044** (0.020)	0.023 (0.015)
Age	0.005 (0.004)	0.008*** (0.003)	0.007** (0.003)	0.006** (0.003)	0.005** (0.002)	0.005** (0.002)
Age-Squared	-0.0001* (0.0001)	-0.0001*** (0.00003)	-0.0001*** (0.00004)	-0.0001*** (0.00003)	-0.0001** (0.00002)	-0.0001*** (0.00002)
<i>Ref: Completed less than 6 years of education</i>						
Between 6 and 12 years	-0.061** (0.031)	0.040 (0.031)	0.015 (0.028)	-0.034* (0.019)	-0.009 (0.021)	0.012 (0.021)
Trade school or vocational training	-0.014 (0.034)	0.057* (0.032)	0.065** (0.029)	-0.010 (0.020)	0.000 (0.022)	-0.007 (0.019)
Some university but no degree	-0.019 (0.032)	0.068** (0.030)	0.020 (0.026)	-0.062*** (0.017)	-0.002 (0.020)	-0.014 (0.017)
University degree or more	-0.132*** (0.032)	-0.022 (0.028)	-0.034 (0.025)	-0.126*** (0.020)	-0.049** (0.020)	-0.021 (0.019)
<i>Ref: Single</i>						
Married registered	-0.004	0.007	-0.070***	-0.019	0.002	0.035**

	(1)	(2)	(3)	(4)	(5)	(6)
	Expect to lose job or be unemployed=1 (conditional on had a job on the day of the survey interview)	Expect income to reduce at least 30 percent=1	Unable to meet basic needs=1	Cutting size of meals=1	Received any financial benefit from work or government =1	Expect to lose health insurance coverage=1 (conditional on had health insurance on the day of the survey interview)
Non-registered relation	(0.023) 0.004	(0.021) -0.010	(0.019) 0.006	(0.016) -0.019*	(0.014) -0.027***	(0.015) -0.012
Others	(0.017) 0.019	(0.014) 0.011	(0.013) 0.017	(0.011) -0.001	(0.010) -0.009	(0.008) 0.029*
Consider oneself a member of an ethnic or racial minority=1	(0.031) 0.066***	(0.026) 0.051***	(0.023) 0.014	(0.019) 0.076***	(0.019) 0.007	(0.017) 0.035***
<i>Ref: Socioeconomic status: Lower</i>	(0.017)	(0.015)	(0.013)	(0.012)	(0.010)	(0.009)
Lower middle	-0.142*** (0.021)	-0.117*** (0.020)	-0.165*** (0.014)	-0.130*** (0.012)	-0.017 (0.015)	-0.028** (0.011)
Upper middle	-0.329*** (0.025)	-0.248*** (0.021)	-0.499*** (0.016)	-0.278*** (0.015)	-0.021 (0.016)	-0.054*** (0.013)
Upper	-0.253*** (0.017)	-0.233*** (0.021)	-0.379*** (0.009)	-0.154*** (0.010)	-0.034* (0.019)	-0.038*** (0.011)
<i>Ref: Rural or Farm or Isolated house</i>						
Small city or town or suburb	-0.044 (0.030)	-0.029 (0.026)	0.037 (0.025)	0.024 (0.022)	-0.024 (0.016)	0.041* (0.024)
Large or capital city	-0.005 (0.030)	0.033 (0.025)	0.025 (0.023)	0.039** (0.019)	-0.031* (0.017)	0.030* (0.016)
Has citizenship or valid residence permit=1	0.047*** (0.015)	0.012 (0.012)	0.001 (0.011)	-0.013 (0.009)	-0.006 (0.008)	-0.007 (0.007)
Household live has outdoor spaces=1	-0.060*** (0.015)	-0.026** (0.013)	-0.049*** (0.012)	-0.060*** (0.010)	0.040*** (0.009)	-0.025*** (0.008)
Log of GDP per capita	-0.151*** (0.019)	-0.138*** (0.016)	-0.151*** (0.014)	-0.070*** (0.012)	0.075*** (0.011)	-0.046*** (0.010)
<i>Ref: South Asia, East Asia, and Pacific</i>						
Europe and Central Asia	0.130*** (0.019)	0.058*** (0.018)	0.120*** (0.016)	-0.020 (0.014)	-0.168*** (0.016)	-0.053*** (0.012)

	(1)	(2)	(3)	(4)	(5)	(6)
	Expect to lose job or be unemployed=1 (conditional on had a job on the day of the survey interview)	Expect income to reduce at least 30 percent=1	Unable to meet basic needs=1	Cutting size of meals=1	Received any financial benefit from work or government =1	Expect to lose health insurance coverage=1 (conditional on had health insurance on the day of the survey interview)
Latin America and the Caribbean	-0.055* (0.028)	0.073*** (0.025)	-0.120*** (0.020)	-0.071*** (0.015)	-0.043*** (0.013)	-0.021** (0.009)
Middle East and North Africa	0.119*** (0.040)	0.063* (0.033)	0.151*** (0.030)	0.038 (0.024)	-0.077*** (0.014)	-0.038*** (0.009)
North America	0.191*** (0.059)	0.102** (0.043)	0.016 (0.041)	0.003 (0.034)	-0.011 (0.021)	-0.058*** (0.011)
Sub Saharan Africa	-0.112** (0.057)	0.066 (0.055)	-0.001 (0.049)	0.041 (0.041)	-0.050* (0.027)	-0.038** (0.015)
Observations	4,454	7,427	7,427	7,427	7,427	5,952
Pseudo-R ²	0.2177	0.0835	0.2216	0.3893	0.4384	0.6619

Note: *** 1%, ** 5%, and * 10% level of significance.

Table B2. Marginal effects of the GME model: the probability of feeling physically or emotionally unsafe and loneliness

	(1)	(2)
	Feeling physically or emotionally unsafe=1	Feeling lonely =1
<i>Ref: Cismen</i>		
Ciswomen	-0.124*** (0.047)	0.162*** (0.043)
Transgender	0.044 (0.052)	0.138*** (0.050)
Non-binary	0.072*** (0.025)	0.065** (0.026)
Age	-0.005* (0.003)	-0.009*** (0.003)
Age-Squared	0.00001 (0.00004)	0.0001** (0.00003)
<i>Ref: Completed less than 6 years of education</i>		
Between 6 and 12 years	0.037 (0.030)	-0.004 (0.031)
Trade school or vocational training	0.037 (0.030)	-0.027 (0.032)
Some university but no degree	0.039 (0.028)	0.001 (0.030)
University degree or more	0.013 (0.026)	-0.004 (0.028)
<i>Ref: Single</i>		
Married registered	-0.118*** (0.020)	-0.124*** (0.021)
Non-registered relation	0.007 (0.014)	-0.153*** (0.015)
Others	-0.003 (0.025)	-0.074*** (0.027)
Consider oneself a member of an ethnic or racial minority=1	0.076*** (0.014)	0.062*** (0.014)
<i>Ref: Socioeconomic status: Lower</i>		
Lower middle	-0.101*** (0.021)	-0.026 (0.024)
Upper middle	-0.212*** (0.022)	-0.072*** (0.024)
Upper	-0.249*** (0.025)	-0.068** (0.033)
<i>Ref: Rural or Farm or Isolated house</i>		
Small city or town or suburb	0.052** (0.026)	0.015 (0.026)
Large or capital city	0.063** (0.025)	0.012 (0.025)
Has citizenship or valid residence permit=1	0.025** (0.012)	0.023** (0.012)
Household live has outdoor spaces=1	-0.099***	-0.064***

	(1)	(2)
	Feeling physically or emotionally unsafe=1	Feeling lonely =1
	(0.013)	(0.013)
Log of GDP per capita	-0.174***	-0.010
	(0.016)	(0.015)
<i>Ref: South Asia, East Asia, and Pacific</i>		
Europe and Central Asia	0.309***	0.067***
	(0.015)	(0.019)
Latin America and the Caribbean	0.228***	-0.010
	(0.020)	(0.025)
Middle East and North Africa	0.355***	0.135***
	(0.021)	(0.028)
North America	0.152***	0.127***
	(0.042)	(0.034)
Sub Saharan Africa	0.049	0.063
	(0.053)	(0.052)
Observations	7,427	7,427
Pseudo-R ²	0.1242	0.0716

Note: *** 1%, ** 5%, and * 10% level of significance.

Table B3. Marginal effects of the GME models: the probability of anxiety and depression over the last 2 weeks of survey (based on PHQ scale)

	(1) Has anxiety (Subscale)	(2) Has depression (Subscale)
<i>Ref: Cismen</i>		
Ciswomen	0.190*** (0.048)	0.037 (0.046)
Transgender	0.078 (0.053)	0.032 (0.052)
Non-binary	0.089*** (0.026)	0.052** (0.026)
Age	-0.009*** (0.003)	-0.013*** (0.003)
Age-Squared	0.00004 (0.00004)	0.0001** (0.00004)
<i>Ref: Completed less than 6 years of education</i>		
Between 6 and 12 years	0.027 (0.030)	0.039 (0.031)
Trade school or vocational training	-0.016 (0.029)	0.017 (0.031)
Some university but no degree	-0.015 (0.027)	0.019 (0.029)
University degree or more	-0.020 (0.026)	-0.004 (0.027)
<i>Ref: Single</i>		
Married registered	-0.037* (0.020)	-0.087*** (0.020)
Non-registered relation	-0.034** (0.014)	-0.059*** (0.014)
Others	-0.001 (0.025)	-0.005 (0.025)
Consider oneself a member of an ethnic or racial minority=1	0.080*** (0.014)	0.072*** (0.014)
<i>Ref: Socioeconomic status: Lower</i>		
Lower middle	-0.120*** (0.018)	-0.138*** (0.019)
Upper middle	-0.212*** (0.020)	-0.254*** (0.020)
Upper	-0.179*** (0.021)	-0.225*** (0.021)
<i>Ref: Rural or Farm or Isolated house</i>		
Small city or town or suburb	-0.001 (0.026)	-0.003 (0.026)
Large or capital city	-0.014 (0.025)	-0.007 (0.025)
Has citizenship or valid residence permit=1	0.014 (0.012)	0.045*** (0.013)
Household live has outdoor spaces=1	-0.063***	-0.076***

	(1)	(2)
	Has anxiety (Subscale)	Has depression (Subscale)
	(0.013)	(0.013)
Log of GDP per capita	-0.024*	-0.037**
	(0.015)	(0.015)
<i>Ref: South Asia, East Asia, and Pacific</i>		
Europe and Central Asia	0.129***	0.165***
	(0.017)	(0.017)
Latin America and the Caribbean	0.197***	0.103***
	(0.026)	(0.026)
Middle East and North Africa	0.294***	0.272***
	(0.032)	(0.030)
North America	0.238***	0.198***
	(0.042)	(0.040)
Sub Saharan Africa	0.250***	0.239***
	(0.054)	(0.051)
Observations	7,427	7,427
Pseudo-R ²	0.1325	0.1117

Note: *** 1%, ** 5%, and * 10% level of significance.