Indian female migrants face greater barriers to post−Covid recovery than males: Evidence from a panel study

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Summary

Background India's abrupt nationwide Covid−19 lockdown internally displaced millions of migrant workers, who returned to distant rural homes. Documenting their labour market reintegration is a critical aspect of understanding the economic costs of the pandemic for India's poor. In a country marked by low and declining female labour force participation, identifying gender gaps in labour market reintegration − as a marker of both women's vulnerability at times of crisis and setbacks in women's agency − is especially important. Yet most studies of pandemic−displaced internal migrants in India are small, rely on highly selected convenience samples, and lack a gender focus.

Methods Beginning in April 2020 we enrolled roughly 4,600 displaced migrants who had, during the lockdown, returned to two of India's poorest states into a cohort observational study which tracked enrolees through July 2021. Survey respondents were randomly selected from the states' official databases of return migrants, with sampling stratified by state and gender. 85% of enrolees (3950) were working prior to the pandemic. Our difference-in-means analysis uses three survey waves conducted in July to August 2020, January to March 2021, and June to July 2021. Our analysis focuses on a balanced panel of 1780 previously working enrolees (the 45% of respondents present in the first wave that also participated in the subsequent two survey rounds). Primary outcomes of interest include labour market re-entry, earnings, and measures of vulnerability by gender.

Findings Before the March 2020 national lockdown, 98% (95% CI [97,99]) of workers were employed in the non-agricultural sector. In July 2020, one month after the end of the lockdown, incomes plummet, with both genders earning roughly 17% of their pre-pandemic incomes. 47% (95% CI [45,49]) were employed in agriculture and 37% (95% CI [35,39]) were unemployed. Remigration is critical to regaining income − by January 2021, male re-migrants report earnings on par with their pre-pandemic incomes, while men remaining in rural areas earn only 23% (95% CI [19,27]) of their pre-pandemic income. Remigration benefits women to a lesser extent − female re-migrants regain no more than 65% (95% CI [57,73]) of their pre-pandemic income at any point. Yet men and women struggle to remigrate throughout − by July 2021, no more than 63% (95% CI [60,66]) of men and 55% (95% CI [51,59]) of women had left their home villages since returning. Gender gaps in income recovery largely reflect higher rates of unemployment among women, both among those remaining in rural areas (9 percentage points (95% CI [6,13]) higher than men across waves) and among those who remigrate (13 percentage points (95% CI [9,17]) higher than men across waves). As a result, we observe gender gaps in well-being: relative to male counterparts, women across waves were 7 percentage points (95% CI [4,10]) more likely to report reduced consumption of essential goods and fared 6 percentage points (95% CI [4,7]) worse on a food insecurity index.

Interpretation Displaced migrants of both genders experienced persistent hardships for over a year after the initial pandemic lockdown. Women fare worse, driven by both lower rates of remigration and lower rates of labour market re-entry both inside and outside home villages. Some women drop out of the labour force entirely, but most unemployed report seeking or being available to work. In short, pandemic-induced labour market displacement has far-reaching, long-term consequences for migrant workers, especially women.

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Research in context

Evidence before this study

Most research documenting the experience of pandemic-displaced migrants in India is focused on difficulties faced in returning to their home villages and the immediate consequences of this displacement. Existing evidence has found high levels of short-run economic and psychological distress, especially among women and children, and under-coverage of government programs designed to ease the lockdown's sudden economic shock.

Added value of this study

This study contributes to existing literature by surveying a large sample of displaced male and female migrant workers in two of India's poorest states, which account for 18% of pandemic-displaced migrants. Our work takes a longer-term view, tracking study participants' efforts to remigrate and reintegrate into the labour force over 15 months. We document sustained difficulties attaining pre-pandemic levels of income and consumption insecurity, especially among women, who struggle even after remigrating.

Implications of all the available evidence

Taken as a whole, the evidence underscores that pandemic-displaced Indian migrant workers are a vulnerable and under-served social group, who have faced (and will likely continue to face) lasting negative effects of the Covid-19 pandemic. This population — especially women — would likely benefit from programs designed to facilitate re-entry into urban labour markets; holistic social protection policies that address other effects of the pandemic (e.g., psychological distress) may be particularly valuable.

Introduction

On March 24, 2020, India responded to the Covid-19 pandemic by announcing one of the largest and strictest lockdowns in the world. Announced with just four hours' notice, the nationwide lockdown caused millions of low-income migrant workers to return to home villages, some traveling on foot and others via crowded specially-designated buses and trains. Once returned, migrants were often placed in government-run quarantine centres, facing stigma and uncertain job prospects. The economic consequences were particularly severe for these migrants, families dependent on remittances, and other informal workers.[1–10] The nationwide lockdown was lifted on May 31, 2020, and the country began opening up in stages until March 2021, when the Delta variant devastated the country. New state-managed lockdowns were announced, threatening a fragile economic recovery, and precipitating another (smaller-scale) return of migrants to rural areas.[11–13]

Domestic rural-urban migration is how many households in lower-income countries exit poverty,[14–18] and it is also an important contributor to economic growth.[19,20] While female migration in India is largely linked to marriage, the number of women migrating for work had been increasing rapidly pre-pandemic.[21] Weak re-integration of returned migrants into urban labour markets thus both threatens household well-being and economic growth.

Adverse impacts of displacement may be especially salient for female return migrants: Indian women are some of the least employed in the world, with only 18.6% in the labour force per the nationally-representative 2018-19 Periodic Labour Force Survey (PLFS), and rural women's labour force participation has declined over the past twenty years, in part due to lack of jobs considered suitable for women.[22] Yet research shows that women's access to higher-paying formal sector jobs — such as those more widely available in urban areas — increases women's career aspirations while delaying marriage and child bearing,[23] which is, in turn, associated with better outcomes for women and their families.[24–26] Thus, Covid-induced job dislocation and urban displacement could have lasting negative implications for a female migrant's agency and her family's well-being.

More broadly, women around the world have felt the impact of pandemic-induced challenges disproportionately,[27–31] and evidence suggests India is no exception. The pandemic has differentially reduced Indian women's employment,[22,32,33] imposed additional childcare responsibilities,[34] and increased rates of

mental distress and domestic violence among the general female population.[35]

While researchers have sought to understand vulnerable migrants' well-being and the challenges they face through the pandemic,[6,36−42] most studies have been short term, lack a gender focus, and use convenience samples — such as stranded migrants seeking assistance from NGOs — that may be especially prone to selection bias.

This study contributes to the existing literature by documenting longer-term experiences of pandemic-displaced migrant workers, with a focus on gender gaps in remigration, labour market integration, and economic hardship. We leverage unique partnerships with two of India's poorest states, which granted our research team access to databases with information on over 435,000 migrant workers who returned to their home villages in the immediate aftermath of India's first lockdown. We follow economically active urban migrants displaced by the nationwide lockdown for a 15-month period, tracking their short and longer-term ability to recover, and their resilience through a second wave of lockdown restrictions and health threats.

Methods

Study design

Our cohort observational study includes four survey rounds conducted between April 2020 and June 2021 with a sample of migrants who returned during the national lockdown to their home states of Bihar and Chhattisgarh in north and central India, respectively.[1] According to official statistics, these two states account for nearly 18% of all return migrants displaced by the Covid pandemic.[43] Sample respondents were drawn from databases of migrants registered as returnees by government officials between April and June 2020. In Bihar, government officials collected contact information from all returning migrants at inter-state transport hubs, yielding a list of approximately 651,000 individuals, which was accessed by our research team in April

and May 2020. In Chhattisgarh, local officials collected contact information from returning migrants when they arrived at their designated local quarantine center, yielding a list of 580,968 migrants, which was accessed by our research team in May and June 2020.[2] Before selecting individuals to be surveyed, we dropped those under the age of 18 from these lists and inferred gender based on name.

Survey procedure

We administered phone-based surveys of return migrants across four rounds: April to June 2020; July to August 2020; January to March 2021; and June to July 2021. Survey rounds roughly corresponded to the initial nationwide lockdown, two periods of relative recovery, and then the tail end of India's Delta- variant Covid surge. For the first survey round, we interviewed 5,879 individuals randomly chosen from the then-current return migrant lists, stratifying to achieve equal proportions by state-gender category.[3] To increase the likelihood of survey completion, we attempted to reach selected individuals on up to six different dates, and contacted individuals were given the option to reschedule surveys for a more convenient time and date. If we were unable to reach a selected respondent, we randomly chose a replacement in the same state-gender category. Surveys were conducted by trained enumerators and took approximately 30 min.

In survey rounds two through four, we targeted completion of at least 1000 surveys per gender in each state. To create state-by-gender calling lists in each round, we prioritized respondents that had completed surveys in previous rounds, then respondents with failed contact attempts or incomplete surveys from previous rounds, and finally individuals who had not yet been contacted — randomly ordering individuals within each group. If in a given round we were unable to reach a selected respondent, a replacement was chosen from the same state-gender ordered list. We completed surveys with 4644 individuals in round two, 4829 in round three, and 4318 in round four.[4] Overall, 45% of respondents

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[1] Both Bihar (pop. 100 million) and Chhattisgarh (pop. 25 million) are low−income states. However, per the 2011 Census, Bihar is a high out−migration state, with roughly 8 million Biharis living outside the state, while Chhattisgarh is a relatively low out−migration state, with roughly 0.5 million out−migrants.[52]

[2] Given the states' different approaches to registration and quarantine, 99 percent of returned migrants in Chhattisgarh reported staying at a quarantine center, compared to just 51 percent in Bihar. We designed the Chhattisgarh registration forms in collaboration with state government officials and a local non−profit organization. The registration portal was open from May 29, 2020 to June 25, 2020.

[3] Potential respondents were selected from the sampling frame using Stata statistical software'x0027s random number generator. In Chhattisgarh, sampling was also stratified by the state'x0027s five divisions, which are made up of groups of districts. In some cases, the total number of women in a stratum was less than the desired sample, so all women were included.

[4] We maintained a record of the "final status" of each respondent in each round, including reasons for survey non−completion. Small incentives of Rs 50 or 100 in phone credit were provided to respondents for survey completion in rounds two through four. Since return migrants were often under significant economic stress, enumerators in these rounds also gave respondents the option to receive information about resources to help them locate jobs and additional support.

interviewed in round two were also surveyed in rounds three and four. Within these balanced-panel respondents, 99% of men and 67% of women were working before the pandemic.[5]

We restrict our analysis sample to respondents who were employed immediately prior to the initial nationwide lockdown. To track individual transitions in and out of work over time, we limit our attention to migrant workers surveyed in rounds two through four (round one, which was conducted when many migrants were still in quarantine centers, was focused on immediate distress and pre-pandemic outcomes). Together these restrictions yield a sample of 1780 migrant workers, 1202 male and 578 female. Appendix Table 1 shows significant differences in some pre-pandemic characteristics between our analysis sample and those who we enrolled in our study but attritted in a future round: attritors are less likely to be married and more likely to come from disadvantaged caste backgrounds; female attritors are more likely to be well educated (class 11 or higher), while male attritors are more likely to have no schooling. However, there are no substantive differences between panel members and attritors in terms of pre-lockdown weekly earnings or work sector, and our findings are essentially unchanged when we include in our analysis the full set of previously employed respondents surveyed in rounds two through four (see Appendix Tables 2 and 3).

Outcomes

We focus on a set of core indicators relevant to displaced migrant well-being throughout the pandemic. The first four indicators relate to work and economic activities and include whether the respondent reported working for pay in the week prior to the survey; whether the respondent had re-migrated (versus remaining in his/her home village); earnings in the previous week; and that same earnings value as a share of the respondent's pre-pandemic weekly earnings.[6] The second set of indicators focuses on respondent consumption, in particular whether the respondent reported their household reducing essential consumption in the month prior to the survey and a food insecurity index for the previous week − defined as the share of affirmative answers to three questions based on indicators from the Food Insecurity Experience Scale,[44] with one taken from each of the low, moderate, and severe ranges of the scale.[7]

Empirical approach. Our population of interest is migrants from Bihar and Chhattisgarh that were working before the pandemic and returned to their homes during India's first Covid lockdown. In order to show first how these workers differed from the general population of workers in these states, we compare our sample to a representative sample of workers in Bihar and Chhattisgarh from the 2017-19 Periodic Labour Force Survey (PLFS). The PLFS provides the most recent government-administered, nationally-representative, person-level data on pre-pandemic employment and income in India at the time of writing, and the survey reports person-level weights designed to be representative of the population. Since our main analysis is unweighted with roughly equal numbers of migrants from Bihar and Chhattisgarh, we further weight our PLFS subsample to put equal weight on each state.

Our analysis focuses on the migrants panel described above, where we use unpaired t-tests allowing for unequal variances to compare means across male and female respondents.[45,46] We do not perform any imputations; missing cases are dropped from our analyses.[8]

Ethics approval and consent to participate

Role of Funding

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[5] This difference likely reflects in large part the importance of marriage as a reason for female out−of−state migration, with women accompanying their migrant worker husbands.

[6] Non−workers include those who are occupied with domestic or childcare duties, those who are studying, those who are not working but searching for work, and those who are not engaged in paid work for any other reason. We elicited monthly pre−pandemic earnings in intervals. When calculating earnings as a share of pre−pandemic earnings, we assign each respondent a pre−pandemic weekly earnings value equal to one quarter of the arithmetic mean of the upper and lower bounds of their earnings interval. The earnings intervals are Rs 1−5,000, 5−10,000, 10−15,000, 15−20,000, 20−25,000, and 25−35,000.

[7] The three indicators are for experiencing the following in the previous week due to lack of resources: "worry that you will run out of food", "ate less than you normally would", and "went an entire day without eating".

[8] In order to examine whether the differences between male and female respondents are sensitive to taking a parametric approach, we present confidence intervals generated using a non-parametric bootstrap with 1,000 replications in Appendix tables 6, 7, & 8. We find that these results are very similar to our baseline confidence intervals.

	Return Migrant Survey			PLFS		
	(1) Men mean/sd	**(2)** Women mean/sd	**(3)** Diff. b/ci95/p	**(4)** Men mean/sd	**(5)** Women mean/sd	**(6)** Diff. b/ci95/p
Age	29.7 (8.6)	30.0 (7.9)	−0.2 [−1.0,0.6] (0.582)	42.8 (9.1)	40.8 (8.5)	2.1 [2.0,2.1] (0.000)
Currently married	0.706 (0.456)	0.908 (0.289)	−0.202 [−0.24,−0.17] (0.000)	0.916 (0.218)	0.550 (0.398)	0.366 [0.28,0.45] (0.000)
Household size	4.4 (3.6)	5.3 (3.2)	−1.0 [−2.3,0.3] (0.131)	5.7 (1.7)	5.4 (1.8)	0.3 [−0.0,0.7] (0.060)
Caste Category						
SC/ST	0.354 (0.478)	0.392 (0.489)	−0.037 [−0.09,0.01] (0.138)	0.307 (0.362)	0.393 (0.391)	−0.085 [−0.20,0.03] (0.131)
OBC/EBC	0.499 (0.500)	0.559 (0.497)	−0.061 [−0.11,−0.01] (0.020)	0.500 (0.392)	0.471 (0.400)	0.030 [0.01,0.05] (0.000)
Muslim	0.077 (0.266)	0.020 (0.140)	0.057 [0.04,0.08] (0.000)	0.069 (0.199)	0.056 (0.184)	0.013 [0.01,0.02] (0.001)
General Category	0.070 (0.256)	0.029 (0.168)	0.041 [0.02,0.06] (0.000)	0.123 (0.258)	0.081 (0.218)	0.042 [−0.06,0.15] (0.413)
Education						
No schooling	0.109 (0.312)	0.391 (0.488)	−0.282 [−0.33,−0.24] (0.000)	0.294 (0.358)	0.489 (0.400)	−0.195 [−0.28,−0.11] (0.000)
Completed Class 1−5	0.228 (0.420)	0.223 (0.417)	0.004 [−0.04,0.05] (0.835)	0.171 (0.295)	0.140 (0.278)	0.031 [0.03,0.03] (.)
Completed Class 6−10	0.500 (0.500)	0.302 (0.459)	0.198 [0.15,0.25] (0.000)	0.367 (0.378)	0.243 (0.343)	0.124 [0.07,0.17] (0.000)
Completed Class 11+	0.163 (0.370)	0.084 (0.277)	0.080 [0.05,0.11] (0.000)	0.168 (0.294)	0.128 (0.268)	0.040 [0.00,0.08] (0.037)
Pre-lockdown Employment						
Self-employed	0.095 (0.293)	0.061 (0.239)	0.034 [0.01,0.06] (0.009)	0.806 (0.310)	0.595 (0.393)	0.211 [0.18,0.24] (0.000)
Weekly earnings (*Rs.*)	2921 (1,208)	1910 (785)	1011 [916,1,106] (0.000)	2140 (1,325)	1324 (2,328)	817 [486,1,147] (0.000)
Sector: Agriculture	0.024 (0.155)	0.007 (0.084)	0.017 [0.01,0.03] (0.002)	0.591 (0.386)	0.435 (0.397)	0.157 [0.02,0.30] (0.031)
Sector: Unskilled labour	0.505 (0.500)	0.784 (0.412)	−0.280 [−0.32,−0.24] (0.000)	0.056 (0.181)	0.116 (0.257)	−0.060 [−0.11,−0.01] (0.014)
Sector: Skilled labour	0.471 (0.499)	0.209 (0.407)	0.262 [0.22,0.31] (0.000)	0.352 (0.375)	0.449 (0.398)	−0.097 [−0.19,−0.00] (0.044)
N	1202	578	1780	9102	749	9851

Table 1: **Sample pre-pandemic characteristics.**
Notes. PLFS statistics are calculated on a subsample selected to be comparable to the Return Migrant Survey sample: men and women, 18 years and older, surveyed in Bihar and Chhattisgarh, excluding those whose primary status is unemployed, profes- sional, or associate professional, as recorded on first-visits from the first and second rounds of PLFS (2017−19). PLFS statistics are weighted with the provided person-level PLFS weights, which are intended to make PLFS population-representative, and then additionally weighted to give both states equal weight for the selected subsample. Weekly earnings from the PLFS are cal- culated from 30-day-prior earnings, and then inflated with the India consumer CPI from the OECD to match the median survey date in the Return Migrant Survey. *p*-values for *t*-tests on unpaired data with unequal variances.

Results

Migrant characteristics pre-pandemic

Table 1 compares our balanced panel sample of return migrants to a representative sample of Bihari and Chhattisgarhi workers in the PLFS. Means are presented separately for men (columns 1 and 4) and women (columns 2 and 5). The differences in means, 95% confidence intervals, and the *p*-values from t-tests of the equality of means across genders for unpaired data with unequal variances are given in columns 3 and 6.

Our migrants are 10 to 13 years younger than the average state-based worker, with male migrants less likely to be married than the general working population and female migrants more likely to be married. The high marriage rates observed for female migrant workers, but not female workers based in Bihar and Chhattisgarh, likely reflect prevailing gender norms regarding work and marriage: Women, especially those with young children, are often expected to stay home and take care of the household. Alongside, migration for work may reduce women's marital prospects as their chastity is called into question; therefore, women may be more likely to migrate once married.[9]

More than 85% of the migrants sample belongs to officially recognized marginalized groups as members of "Scheduled Caste" (SC), "Scheduled Tribe" (ST), or "Other or Extremely Backward Class" (OBC/EBC) groups; only 7% of male migrants and 3% of female migrants belong to the least disadvantaged "General Category" caste groups. Though still low, rates of general category caste memberships are higher in the state-based workers sample, reflecting disproportionate social marginalization among the migrant sample.

Yet the migrant sample is better educated than the general population of workers from Bihar and Chhattisgarh, with 11% of male migrants and 39% of female migrants reporting no schooling, compared to 29 and 49% of men and women in the state-based sample. We also observe notable differences in terms of pre-lockdown employment: less than 10% of migrant workers were self-employed, compared to 81% of men and 60% of women from the PLFS sample. While a significant share of state-based workers are employed in the agricultural sector (59% of men and 44% of women), most migrants work outside agriculture in either unskilled (51% of men and 78% of women) or skilled (47% of men and 21% of women) labour. Finally, male and female migrants reported pre-lockdown weekly earnings of Rs 2921 and Rs 1910 respectively.[10] In line with research documenting high returns to domestic migration, these incomes are substantially higher than

statewide means of Rs 2140 and Rs 1324 among men and women respectively.

To summarize, migrant workers are more likely to belong to disadvantaged social groups, but are better educated and earn more. Female migrants fare significantly worse than their male peers in terms of most measures of advantage, underscoring their vulnerability.

How did the pandemic and lockdown impact migrant outcomes?

Remigration. We begin our analysis of migrant workers' post-lockdown trajectories by examining remigration by gender in Figure 1. Remigration took time: 90% of men and 96% of women were in their home villages during recovery phase 1 (July 2020), more than a month after the nationwide lockdown ended. By recovery phase 2 (January 2021), 53% of men and 46% of women were outside their home villages. Yet just 37% of men and 35% of women remained outside their home village as of Covid wave 2 (June 2021), reflecting a new round of migrant returns that coincided with the Delta variant wave. Looking across waves, 63% of men remigrated at least once, compared to 55% of women (Diff: 8, 95% CI [3,13]). This difference suggests women faced greater barriers to remigration than men, which could have important consequences for their labour market and socioeconomic outcomes.

Employment. Figures 2 and 3 consider migrant transitions in and out of employment sectors. Figure 2 shows that following the lockdown, the majority of unskilled workers — both male and female — transitioned into agricultural work (men: 53%, 95% CI: [49,57]; women: 55%, 95% CI: [51,60]). Skilled workers were most likely to transition into unemployment (men: 44%, 95% CI: [40,48]; women: 65%, 95% CI: [56,73]), followed by agricultural work (men: 37%, 95% CI: [33,41]; women: 28%, 95% CI: [20,36]). While overall unemployment rates in the immediate aftermath of the lockdown are similar for both genders (36−40%), unemployment among women steadily grows, first to 42% during recovery phase 2 and then 53% during Covid wave 2. Men, in contrast, are more likely to find work over the longer term — just 25 and 37% of men are unemployed at recovery phase 2 and Covid wave 2, respectively. This reflects two phenomena: women who transition into unemployment are significantly less likely to transition back out in the following round (women: 41%, men: 63%; Diff: -22, 95% CI: [-27,-16]) *and* women who are

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[9] Most unmarried female workers in the PLFS data are widowed or divorced; thus never−married women account for a very small share of both migrants and state−based workers.

[10] USD 41 and 27 using a January 2020 exchange rate of Rs. 71 per USD.

(a) Women

Recovery Phase 1   Recovery Phase 2   Covid Wave 2

(b) Men

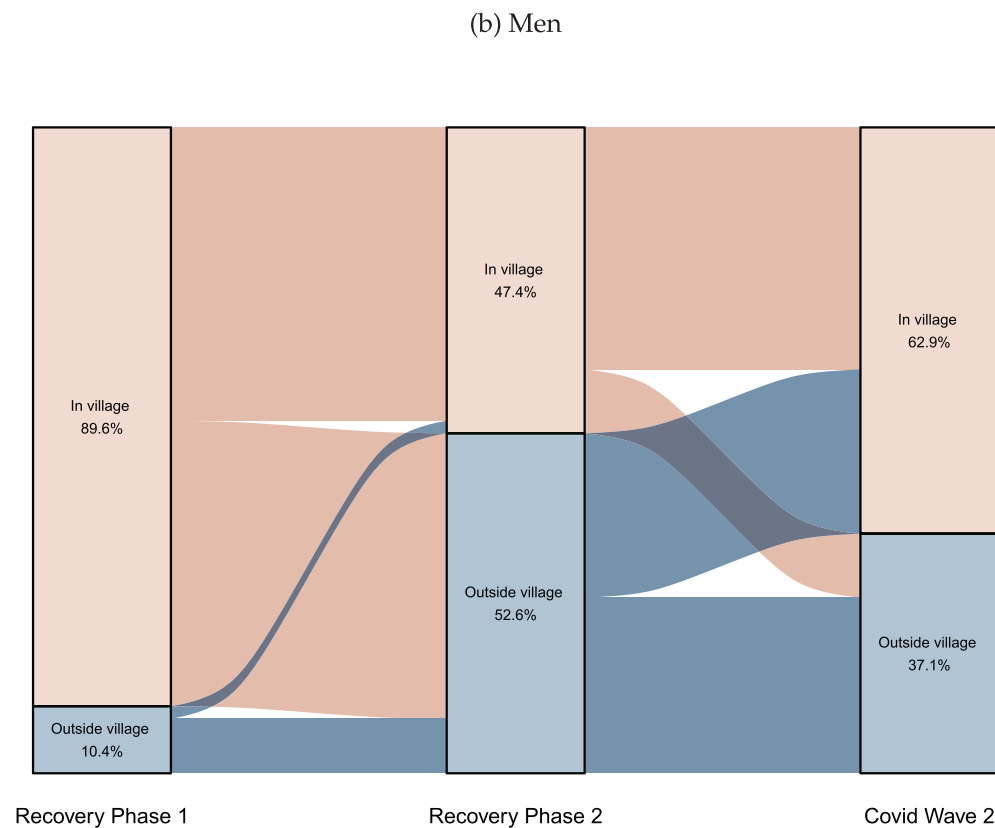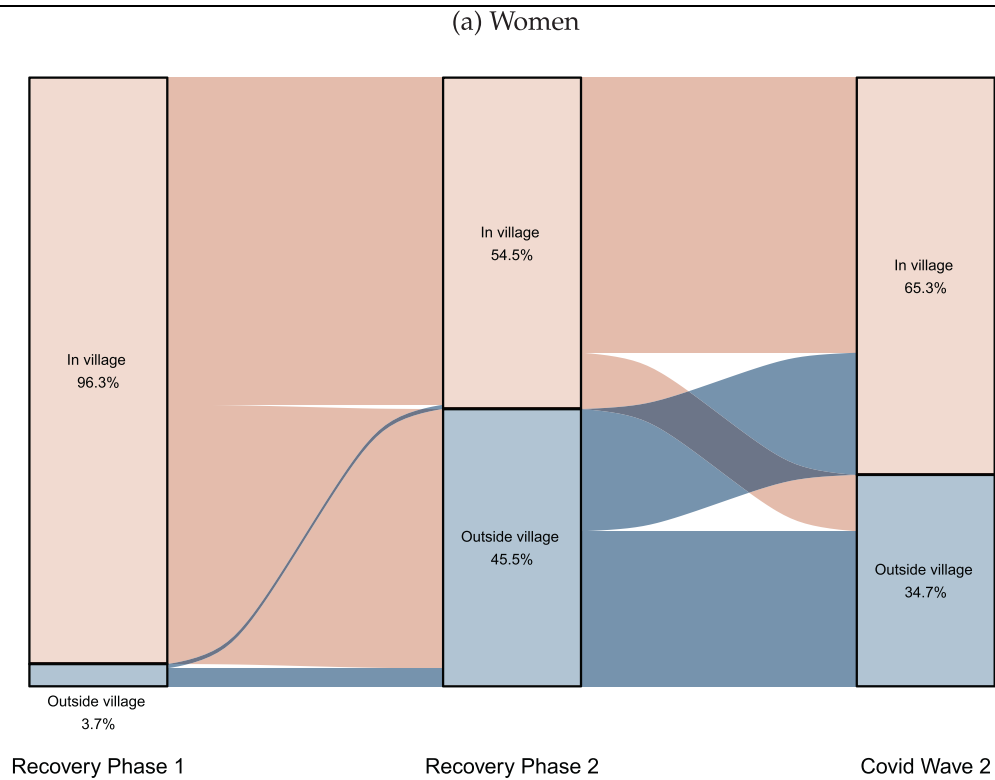Recovery Phase 1   Recovery Phase 2   Covid Wave 2

Figure 1. Remigration status - by gender.

working in a given round are significantly more likely to exit into unemployment than their male peers (women: 40%, men: 28%; Diff: 12, 95% CI: [8,16]). Higher rates of female unemployment do not simply reflect lower rates of remigration, as Figure 3 shows that women are more likely than men to be unemployed even conditional on remigration status.

The unemployed category includes both those actively seeking or ready to work and those no longer seeking work. Though large majorities of both unemployed men and women report seeking or being willing to accept a job across survey rounds, women are significantly less likely than men to do so (women: 86%, men: 94%; Diff: -8, 95% CI: [-11,-5]). Among those unemployed and not seeking work, 60% of women state the reason as due to "domestic duties or pregnancy", compared to 27% of men (Diff: 33, 95% CI: [19,48]). 18% of women indicate "wages too low or no work available", compared to 6% of men (Diff: 12, 95% CI: [3,21]). In contrast, only 15% of women state "health problems or fear of COVID", relative to 42% of men (Diff: -27, 95% CI: [-40,-13]).

Beyond falling into unemployment, Figures 2 and 3 show that women who do stay in the labour market struggle to access high-return work. While men also face challenges finding skilled jobs — with a post- pandemic share in skilled labour peaking in recovery phase 2 at 33% (or 70% of pre-pandemic prevalence) — a maximum of 8% of women (also in recovery phase 2; 39% of pre-pandemic prevalence) are observed working in skilled labour post-pandemic (Diff: -24, 95% CI: [-27,-20]).

Earnings. Panel (a) of Figure 4 presents results relevant to understanding how the above-described labour market transitions relate to income. Recall from Figures 1 and 2 that in recovery phase 1, most migrants remained in their home villages, working in agriculture. As a result, incomes plummeted, with both men and women earning under Rs 500 (USD 7) per week on average, less than 20% of their pre- lockdown income. Moreover, the gender earnings gap shrank to just Rs 151, 95% CI: [41,260]), reflecting poor labour market opportunities for men and women alike. As the recovery progressed, average male income rebounded significantly, reaching Rs 1,670 by January 2021, or 64% of pre-pandemic levels. Women, on the other hand, continued to struggle, with average earnings reaching just 35% of pre- pandemic levels by recovery phase 2, resulting in a gender gap of Rs 1036, 95% CI: [896,1,177]. While the Delta variant wave induced a second round of wage compression, men continued to outpace women in June 2021, earning Rs 1111 per week on average compared to women's weekly earnings of Rs 490 (Diff: Rs 620, 95% CI: [497,744]), or 40% of pre-lockdown earnings for men as compared to 28% for women (Diff: 12, 95% CI: [7,18]).

Well-being. Panel (b) of Figure 4 points to the implications of these economic gender gaps. First, women are significantly more vulnerable: pooling across waves, women are 7 percentage points [27,12] more likely to report cutting back on essentials in their household, with an average 0.06 unit (95% CI [0.04,0.07]) higher food insecurity index score. Second, although rates of distress were highest in recovery phase 1, when most migrants were still in their home villages earning little income, they remained persistently high across survey rounds: in recovery phase 2, for example, roughly 45% of both men and women reported reducing essential consumption to make ends meet.[11]

Implications of remigration for earnings and well-being

Figure 5 asks whether differences in remigration can explain the observed gender differences in earnings and well-being. Panel (a) graphs earnings by gender and migration status. Overall earnings levels — and gender gaps — among those in their home villages remain low. Men in their home villages earn on average just 10 −23% of their pre-pandemic income, and women earn only 11−17%. The story is very different for those who remigrate. First, though it takes time, men who remigrate recover much of their lost income. Average weekly income among male remigrants peaks at Rs 2665 (USD 38) in recovery phase 2, amounting to a full recovery of pre-pandemic income for the average male remigrant. Women, however, continue to struggle: average female earnings also peak in recovery phase 2, but at a significantly lower Rs 1200 (Diff: Rs 1,465, 95% CI: [1,270,1,660]), or 65% of pre-pandemic levels (see Appendix Tables 4 and 5).

Panel (b) of Figure 5 plots markers of distress by gender and remigration status. In general, both men and women who re-migrate are less likely to report cutting back consumption and have lower food insecurity index scores.[12] Overall, our analysis suggests that women faced greater challenges re-integrating into the labour market than their male peers, even conditional on managing to re-migrate. These gender differences are large and persistent, and could have significant implications for women's long-run labour market prospects. While our survey did not capture measures of psychological

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[11] One limitation of our analysis is that we lack data on pre−pandemic levels of distress and therefore cannot measure how post−pandemic incidence of consumption cutbacks and food insecurity compares to pre−pandemic values.

[12] The one exception is that female re-migrants have a higher food insecurity index score in Recovery Phase 1, though this difference is not statistically significant, likely reflecting the very low remigration rates we observe in this round of the survey

(a) Women

Pre−Pandemic   Recovery Phase 1   Recovery Phase 2   Covid Wave 2

(b) Men

Pre−Pandemic   Recovery Phase 1   Recovery Phase 2   Covid Wave 2
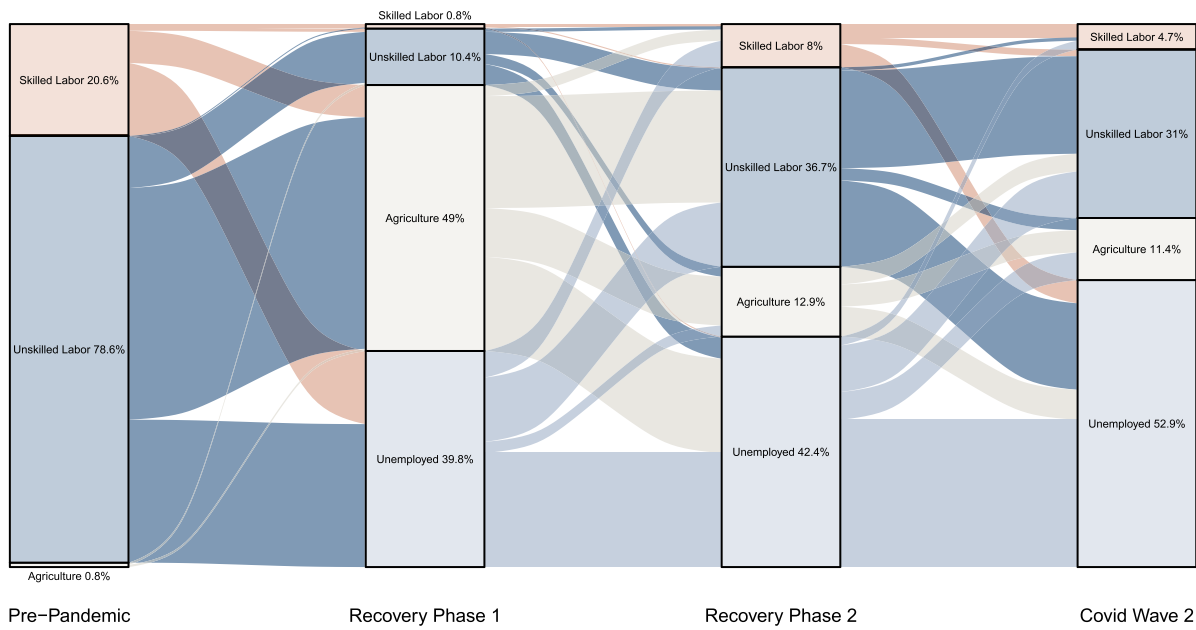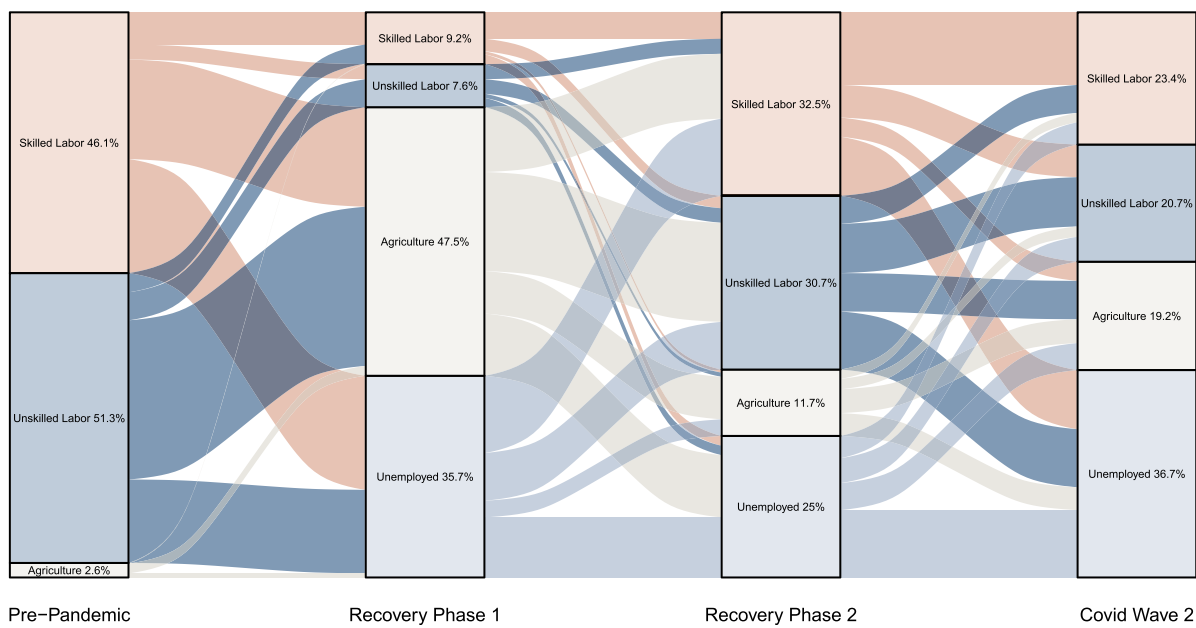
Figure 2. Sector of employment - by gender.

(a) In village

(b) Outside village

Figure 3. Sector of employment - by remigration status.

(a) Earnings

Weekly earnings (Rs.)

Pre-pandemic earnings share

(b) Well-being

Pr(Reduced essentials consumption)

Food insecurity index
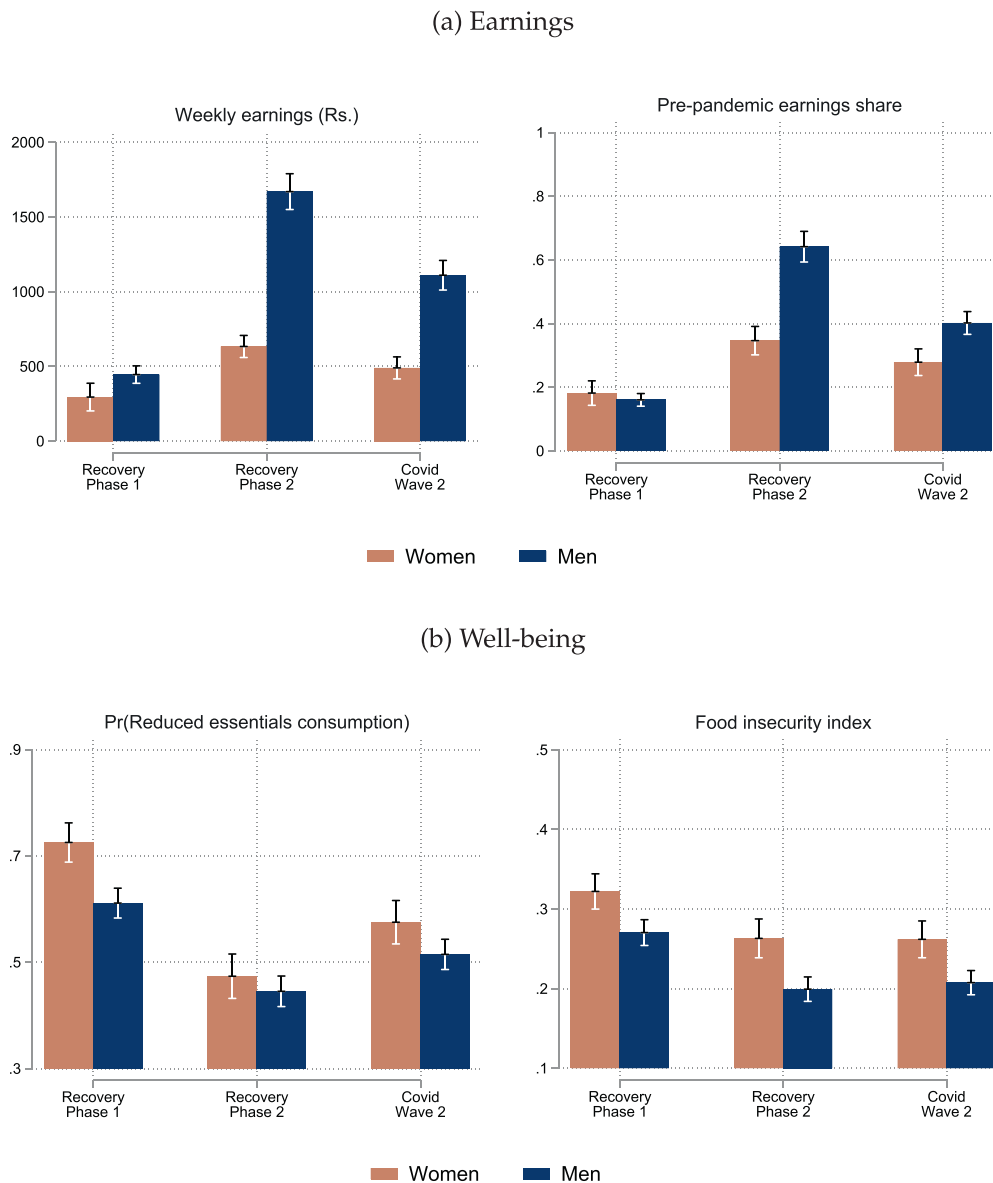
Figure 4. Earnings and well-being.
    Notes: Error bars signify 95% confidence intervals.

well-being, the sustained levels of economic distress we observe suggest that returned migrants − especially women − may have suffered lasting socio-emotional challenges, in line with earlier research pointing to acute short-term distress.[2,35,36,38,39,41,47−50] Understanding the longer-term implications for psychological well-being is therefore an important area for future research.

Discussion

Rural to urban migration is a pathway out of poverty for many households, particularly as agricultural employment opportunities diminish as economies industrialize and develop. For Indian women, in particular, rural to urban migration offers an important opportunity to connect to higher-paying jobs rarely available to them in rural areas. Against this background, we show that the Covid-19 pandemic had adverse long-term repercussions for displaced internal migrants, exacerbating already-large gender gaps in economic outcomes.[51]

Fifteen months after the pandemic began, displaced migrants earned significantly less and were likely to be working in lower-skilled jobs than they had been previously, with female earnings and skilled job losses larger than those of men. Remigration emerged as an

(a) Earnings

Weekly earnings (Rs.)

Pre-pandemic earnings share

Legend: Women, in village · Men, in village · Women, outside village · Men, outside village

(b) Well-being

Pr(Reduced essentials consumption)

Food insecurity index

Legend: Women, in village · Men, in village · Women, outside village · Men, outside village
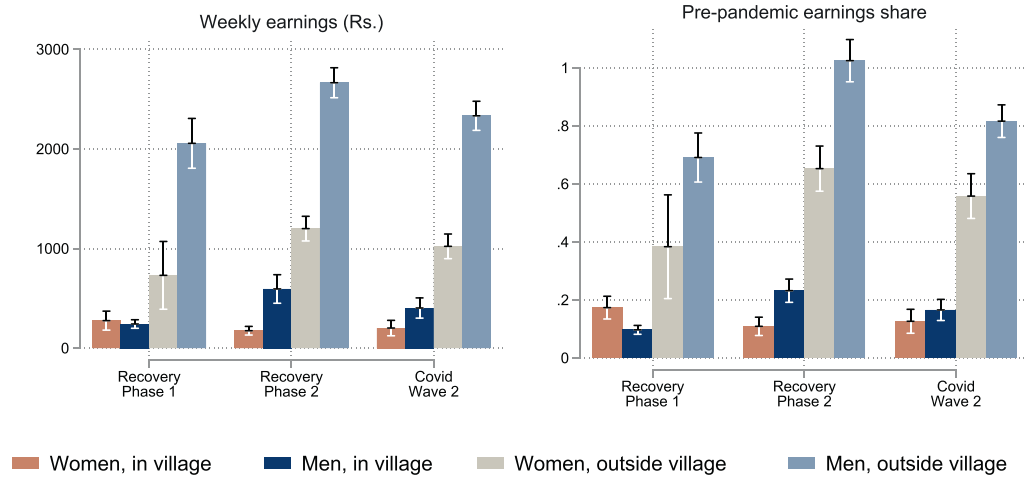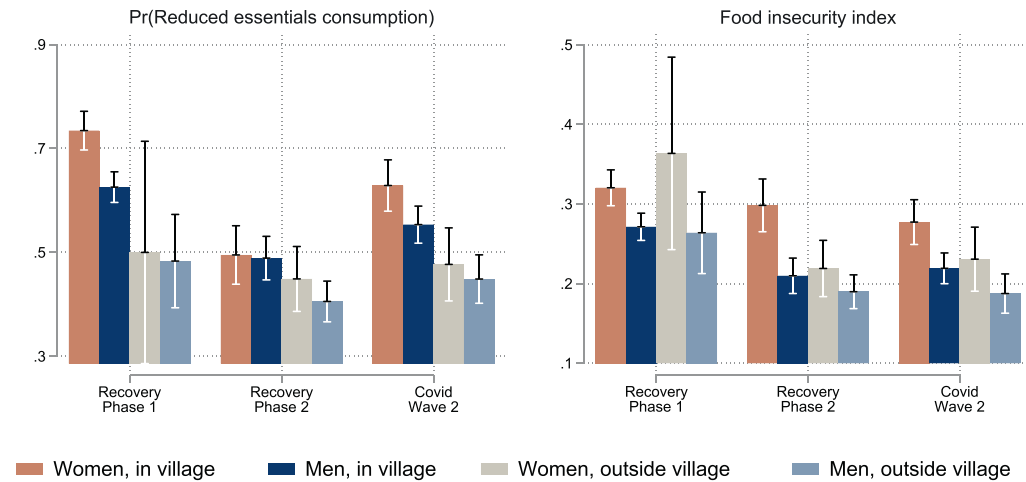
Figure 5. Earnings and well-being - by remigration status.
Notes: Error bars signify 95% confidence intervals.

important income recovery strategy for men, but less so for women — on average male remigrants were able to recover all of their pre-pandemic income prior to the Delta surge, while female remigrants continued to struggle, experiencing lower income and higher unemployment. As a consequence, women remained persistently more vulnerable (as measured by reduced consumption and food insecurity) throughout our entire study period.

This paper's contribution is twofold — to track the evolution of economic outcomes through the pandemic with a large sample of displaced migrants returning to low-income states in rural India, and to quantify

emerging gender gaps in economic reintegration. Our work does have some limitations. First, our research design does not allow us to estimate the causal effect of the pandemic, nor does it allow us to identify the underlying mechanisms that hamper women's recovery relative to men's. While our sampling strategy was designed to be representative of large pool of returned migrant workers, surveys were conducted over the phone, meaning our study under-represents the experiences of those who lacked phone numbers or regular access to a phone. And although our two study states account for nearly one fifth of all migrants displaced by the pandemic, we cannot speak to the experiences of

migrants in other states; we expect some commonalities to hold, since migrants from different states tend to work in common urban labour markets, but labour market conditions in home villages could also be very important for determining outcomes, and are likely heterogeneous across states. Finally, our analysis sample is limited to a subset of individuals who participated in the last three waves of our survey. While survey non-response could relate to migrant economic activity and well-being, our results look very similar when all former worker respondents are included in the analysis regardless of their response rates across different survey waves (see Appendix Tables 2 and 3). Overall, our findings paint a consistent picture of elevated distress and significant gender gaps in the aftermath of India's nationwide lockdown.

Our research raises concerns about the pandemic's longer-term consequences for women, especially related to their ability to access meaningful work via urban labour markets. In many ways, our sample of migrants includes some of the most intrepid women in India's work force, willing to transgress social norms and brave safety concerns in order to secure more remunerative work outside their home villages. Their post-pandemic struggles point to an urgent need to better understand the barriers faced by female job seekers and identify policies that facilitate women's access to high-return jobs.

Contributors

JA, MJ, YN, RP, SS, and CTM designed the study, collected the dakta, supervised the study, and interpreted the results. JA, YN, and CTM accessed the raw data and drafted the first version of the manuscript. MJ, RP, and SS made critical revisions to the manuscript. All authors approved the final version of the manuscript, had full access to the data, and take responsibility for the integrity of the data and the accuracy of the analysis.

Data sharing statement

De-identified datasets used for the analysis presented in this manuscript and code will be posted on an online open data platform prior to final publication. Until that point, data is available upon reasonable request from Jenna Allard (jennifer.allard@yale.edu).

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.eclinm.2022.101631.

Appendix

	Men			Women		
	(1) Panel mean/sd	(2) Attritors mean/sd	(3) Diff. b/ci95/p	(4) Panel mean/sd	(5) Attritors mean/sd	(6) Diff. b/ci95/p
Age	29.7	29.1	−0.6	30.0	29.4	−0.5
	(8.6)	(9.3)	[−1.3, 0.1]	(7.9)	(8.4)	[−1.4, 0.3]
			(0.076)			(0.224)
Currently married	0.706	0.643	−0.064	0.908	0.839	−0.070
	(0.456)	(0.479)	[−0.10, −0.03]	(0.289)	(0.368)	[−0.10, −0.03]
			(0.001)			(0.000)
Household size	5.1	5.0	−0.0	5.2	5.2	0.0
	(3.2)	(3.1)	[−0.3, 0.2]	(2.9)	(3.2)	[−0.3, 0.4]
Caste Category			(0.746)			(0.831)
SC/ST	0.354	0.436	0.082	0.392	0.468	0.076
	(0.478)	(0.496)	[0.04, 0.12]	(0.489)	(0.499)	[0.02, 0.13]
			(0.000)			(0.006)
OBC/EBC	0.499	0.416	−0.082	0.559	0.472	−0.088
	(0.500)	(0.493)	[−0.12, −0.04]	(0.497)	(0.500)	[−0.14, −0.03]
			(0.000)			(0.002)
Muslim	0.077	0.071	−0.005	0.020	0.028	0.008
	(0.266)	(0.258)	[−0.03, 0.02]	(0.140)	(0.164)	[−0.01, 0.02]
			(0.624)			(0.362)
General Category	0.070	0.076	0.006	0.029	0.033	0.004
	(0.256)	(0.265)	[−0.02, 0.03]	(0.168)	(0.179)	[−0.02, 0.02]
Education			(0.600)			(0.689)
No schooling	0.109	0.156	0.048	0.391	0.380	−0.011
	(0.312)	(0.363)	[0.02, 0.07]	(0.488)	(0.486)	[−0.06, 0.04]
			(0.000)			(0.684)
Completed Class 1-5	0.228	0.205	−0.023	0.223	0.210	−0.014
	(0.420)	(0.404)	[−0.05, 0.01]	(0.417)	(0.407)	[−0.06, 0.03]
			(0.160)			(0.543)
Completed Class 6-10	0.500	0.475	−0.025	0.302	0.287	−0.015
	(0.500)	(0.500)	[−0.06, 0.01]	(0.459)	(0.452)	[−0.06, 0.03]
			(0.208)			(0.541)
Completed Class 11+	0.163	0.164	0.000	0.084	0.124	0.040
	(0.370)	(0.370)	[−0.03, 0.03]	(0.277)	(0.329)	[0.01, 0.07]
Pre-lockdown Employment			(0.978)			(0.015)
Self-employed	0.095	0.086	−0.009	0.061	0.070	0.009
	(0.293)	(0.280)	[−0.03, 0.01]	(0.239)	(0.255)	[−0.02, 0.04]
			(0.430)			(0.482)
Weekly earnings (*Rs.*)	2921	2934	14	1910	1840	−70
	(1208)	(1258)	[−84, 111]	(785)	(780)	[−158, 18]
			(0.784)			(0.122)
Sector: Agriculture	0.024	0.027	0.003	0.007	0.019	0.012
	(0.155)	(0.162)	[−0.01, 0.02]	(0.084)	(0.138)	[−0.00, 0.02]
			(0.684)			(0.054)
Sector: Unskilled labour	0.505	0.529	0.024	0.784	0.755	−0.029
	(0.500)	(0.499)	[−0.02, 0.06]	(0.412)	(0.430)	[−0.08, 0.02]
			(0.226)			(0.225)
Sector: Skilled labour	0.471	0.444	−0.027	0.209	0.226	0.017
	(0.499)	(0.497)	[−0.07, 0.01]	(0.407)	(0.418)	[−0.03, 0.06]
			(0.179)			(0.475)
N	1202	1374	2576	578	800	1378

Table 1: **Sample pre-pandemic characteristics: panel respondents v. attritors.**
Notes *p*-values for t-tests on unpaired data with unequal variances.

	Recovery Phase 1 (Jul '20)			Recovery Phase 2 (Jan '21)			Covid Wave 2 (Jun '21)		
	(1) Men mean/sd	(2) Women mean/sd	(3) Diff. b/ci95/p	(4) Men mean/sd	(5) Women mean/sd	(6) Diff. b/ci95/p	(7) Men mean/sd	(8) Women mean/sd	(9) Diff. b/ci95/p
Outside village	0.103 (0.305)	0.040 (0.196)	0.063 [0.04,0.09] (0.000)	0.525 (0.500)	0.456 (0.498)	0.070 [0.02,0.12] (0.006)	0.370 (0.483)	0.348 (0.477)	0.022 [−0.03,0.07] (0.366)
Sector: Skilled labour	0.096 (0.294)	0.012 (0.110)	0.084 [0.06,0.10] (0.000)	0.324 (0.468)	0.087 (0.281)	0.237 [0.20,0.27] (0.000)	0.241 (0.428)	0.047 (0.212)	0.194 [0.16,0.22] (0.000)
Sector: Unskilled labour	0.079 (0.270)	0.105 (0.306)	−0.026 [−0.06,0.00] (0.085)	0.308 (0.462)	0.367 (0.483)	−0.059 [−0.11,−0.01] (0.015)	0.203 (0.402)	0.298 (0.458)	−0.096 [−0.14,−0.05] (0.000)
Sector: Agriculture	0.460 (0.499)	0.490 (0.500)	−0.030 [−0.08,0.02] (0.235)	0.116 (0.320)	0.122 (0.327)	−0.006 [−0.04,0.03] (0.716)	0.184 (0.388)	0.122 (0.328)	0.062 [0.03,0.10] (0.000)
Unemployed	0.360 (0.480)	0.390 (0.488)	−0.030 [−0.08,0.02] (0.225)	0.246 (0.431)	0.419 (0.494)	−0.172 [−0.22,−0.13] (0.000)	0.373 (0.484)	0.537 (0.499)	−0.164 [−0.21,−0.11] (0.000)
Weekly earnings (*Rs.*)	446 (968)	295 (1117)	151 [41,260] (0.007)	1670 (2091)	634 (887)	1036 [896,1,177] (0.000)	1111 (1737)	490 (892)	620 [497,744] (0.000)
Pre-pandemic earnings share	0.160 (0.325)	0.182 (0.453)	−0.021 [−0.06,0.02] (0.334)	0.642 (0.831)	0.346 (0.526)	0.295 [0.23,0.36] (0.000)	0.402 (0.621)	0.279 (0.496)	0.123 [0.07,0.18] (0.000)
Reduced essentials consumption	0.611 (0.488)	0.725 (0.447)	−0.114 [−0.16,−0.07] (0.000)	0.445 (0.497)	0.474 (0.500)	−0.028 [−0.08,0.02] (0.273)	0.515 (0.500)	0.575 (0.495)	−0.060 [−0.11,−0.01] (0.017)
Food insecurity index	0.270 (0.281)	0.322 (0.268)	−0.052 [−0.08,−0.02] (0.000)	0.199 (0.266)	0.263 (0.292)	−0.064 [−0.09,−0.03] (0.000)	0.208 (0.268)	0.262 (0.280)	−0.054 [−0.08,−0.03] (0.000)
N	1201	577	1778	1201	578	1779	1198	576	1774

Table 2: **Sample characteristics by wave and gender.**
Notes. *p*-values for t-tests on unpaired data with unequal variances.

	Recovery Phase 1 (Jul '20)			Recovery Phase 2 (Jan '21)			Covid Wave 2 (Jun '21)		
	(1) Males mean/sd	(2) Females mean/sd	(3) Diff. b/ci95/p	(4) Males mean/sd	(5) Females mean/sd	(6) Diff. b/ci95/p	(7) Males mean/sd	(8) Females mean/sd	(9) Diff. b/ci95/p
Outside village	0.089 (0.285)	0.036 (0.187)	0.053 [0.04,0.07] (0.000)	0.518 (0.500)	0.466 (0.499)	0.052 [0.02,0.09] (0.003)	0.366 (0.482)	0.341 (0.474)	0.025 [−0.01,0.06] (0.128)
Sector: Skilled labour	0.084 (0.278)	0.014 (0.117)	0.071 [0.06,0.08] (0.000)	0.308 (0.462)	0.091 (0.288)	0.216 [0.19,0.24] (0.000)	0.237 (0.425)	0.051 (0.219)	0.186 [0.16,0.21] (0.000)
Sector: Unskilled labour	0.071 (0.256)	0.083 (0.276)	−0.012 [−0.03,0.01] (0.170)	0.313 (0.464)	0.369 (0.483)	−0.056 [−0.09,−0.02] (0.001)	0.184 (0.388)	0.267 (0.443)	−0.083 [−0.11,−0.05] (0.000)
Sector: Agriculture	0.456 (0.498)	0.479 (0.500)	−0.023 [−0.06,0.01] (0.162)	0.120 (0.325)	0.109 (0.312)	0.011 [−0.01,0.03] (0.331)	0.210 (0.408)	0.140 (0.347)	0.071 [0.05,0.10] (0.000)
Unemployed	0.382 (0.486)	0.420 (0.494)	−0.038 [−0.07,−0.01] (0.020)	0.250 (0.433)	0.419 (0.494)	−0.169 [−0.20,−0.14] (0.000)	0.368 (0.482)	0.544 (0.498)	−0.176 [−0.21,−0.14] (0.000)
Weekly earnings (*Rs.*)	398 (920)	248 (815)	149 [91,207] (0.000)	1574 (1,919)	665 (909)	909 [814,1,005] (0.000)	1117 (1837)	477 (1212)	639 [537,741] (0.000)
Pre-pandemic earnings share	0.146 (0.330)	0.158 (0.359)	−0.012 [−0.037,0.013] (0.347)	0.604 (0.761)	0.410 (0.597)	0.193 [0.146,0.241] (0.000)	0.392 (0.627)	0.263 (0.476)	0.129 [0.091,0.166] (0.000)

Table 3 (Continued)

	Recovery Phase 1 (Jul '20)			Recovery Phase 2 (Jan '21)			Covid Wave 2 (Jun '21)		
	(1) Males mean/sd	(2) Females mean/sd	(3) Diff. b/ci95/p	(4) Males mean/sd	(5) Females mean/sd	(6) Diff. b/ci95/p	(7) Males mean/sd	(8) Females mean/sd	(9) Diff. b/ci95/p
Reduced essentials consumption	0.609 (0.488)	0.705 (0.456)	−0.096 [−0.127,−0.065] (0.000)	0.454 (0.498)	0.500 (0.500)	−0.046 [−0.081,−0.011] (0.010)	0.500 (0.500)	0.608 (0.488)	−0.108 [−0.142,−0.074] (0.000)
Food insecurity index	0.258 (0.277)	0.319 (0.269)	−0.062 [−0.080,−0.043] (0.000)	0.201 (0.269)	0.256 (0.284)	−0.056 [−0.075,−0.036] (0.000)	0.205 (0.267)	0.278 (0.284)	−0.073 [−0.092,−0.054] (0.000)
N	2566	1375	3941	2226	1332	3558	2072	1446	3518

Table 3: **Sample characteristics by wave and gender, all previously employed respondents.**
Notes. *p*-values for t-tests on unpaired data with unequal variances.

	Recovery Phase 1 (Jul '20)			Recovery Phase 2 (Jan '21)			Covid Wave 2 (Jun '21)		
	(1) Men mean/sd	(2) Women mean/sd	(3) Diff. b/ci95/p	(4) Men mean/sd	(5) Women mean/sd	(6) Diff. b/ci95/p	(7) Men mean/sd	(8) Women mean/sd	(9) Diff. b/ci95/p
Sector: Skilled labour	0.034 (0.182)	0.007 (0.085)	0.027 [0.01,0.04] (0.000)	0.140 (0.348)	0.029 (0.168)	0.111 [0.08,0.15] (0.000)	0.086 (0.281)	0.019 (0.136)	0.068 [0.04,0.09] (0.000)
Sector: Unskilled labour	0.058 (0.233)	0.087 (0.282)	−0.030 [−0.06,−0.00] (0.036)	0.179 (0.384)	0.106 (0.308)	0.073 [0.03,0.12] (0.002)	0.124 (0.329)	0.141 (0.349)	−0.018 [−0.06,0.02] (0.410)
Sector: Agriculture	0.511 (0.500)	0.511 (0.500)	0.000 [−0.05,0.05] (0.986)	0.227 (0.419)	0.219 (0.414)	0.009 [−0.05,0.07] (0.767)	0.274 (0.446)	0.181 (0.386)	0.092 [0.04,0.14] (0.000)
Unemployed	0.390 (0.488)	0.392 (0.489)	−0.001 [−0.05,0.05] (0.962)	0.447 (0.498)	0.643 (0.480)	−0.196 [−0.26,−0.13] (0.000)	0.517 (0.500)	0.661 (0.474)	−0.145 [−0.20,−0.08] (0.000)
Weekly earnings (*Rs.*)	243 (668)	276 (1,124)	−34 [−138,71] (0.527)	594 (1733)	175 (387)	419 [270,569] (0.000)	403 (1418)	202 (755)	201 [73,329] (0.002)
Pre-pandemic earnings share	0.097 (0.236)	0.173 (0.453)	−0.077 [−0.12,−0.03] (0.000)	0.232 (0.481)	0.109 (0.278)	0.123 [0.07,0.17] (0.000)	0.165 (0.504)	0.126 (0.394)	0.039 [−0.02,0.09] (0.165)
Reduced essentials consumption	0.626 (0.484)	0.734 (0.442)	−0.109 [−0.16,−0.06] (0.000)	0.489 (0.500)	0.495 (0.501)	−0.006 [−0.08,0.06] (0.866)	0.553 (0.497)	0.629 (0.484)	−0.075 [−0.14,−0.01] (0.016)
Food insecurity index	0.271 (0.281)	0.320 (0.267)	−0.049 [−0.08,−0.02] (0.001)	0.210 (0.266)	0.298 (0.295)	−0.089 [−0.13,−0.05] (0.000)	0.219 (0.270)	0.277 (0.276)	−0.058 [−0.09,−0.02] (0.001)
N	1073	554	1627	570	314	884	753	375	1128

Table 4: **Sample characteristics by wave and gender, inside village only.**
Notes. *p*-values for t-tests on unpaired data with unequal variances.

	Recovery Phase 1 (Jul '20)			Recovery Phase 2 (Jan '21)			Covid Wave 2 (Jun '21)		
	(1) Men mean/sd	(2) Women mean/sd	(3) Diff. b/ci95/p	(4) Men mean/sd	(5) Women mean/sd	(6) Diff. b/ci95/p	(7) Men mean/sd	(8) Women mean/sd	(9) Diff. b/ci95/p
Sector: Skilled labour	0.626 (0.486)	0.130 (0.344)	0.496 [0.33,0.66] (0.000)	0.493 (0.500)	0.157 (0.365)	0.335 [0.28,0.40] (0.000)	0.505 (0.501)	0.102 (0.303)	0.403 [0.34,0.47] (0.000)
Sector: Unskilled labour	0.260 (0.441)	0.522 (0.511)	−0.262 [−0.48,−0.04] (0.029)	0.427 (0.495)	0.689 (0.464)	−0.262 [−0.33,−0.19] (0.000)	0.337 (0.473)	0.599 (0.491)	−0.262 [−0.34,−0.18] (0.000)
Sector: Agriculture	0.016 (0.127)	0.000 (0.000)	0.016 [−0.01,0.04] (0.158)	0.013 (0.114)	0.004 (0.063)	0.009 [−0.00,0.02] (0.131)	0.032 (0.175)	0.005 (0.071)	0.027 [0.01,0.05] (0.007)
Unemployed	0.098 (0.298)	0.348 (0.487)	−0.250 [−0.46,−0.04] (0.025)	0.065 (0.247)	0.148 (0.356)	−0.083 [−0.13,−0.04] (0.001)	0.129 (0.335)	0.303 (0.461)	−0.174 [−0.25,−0.10] (0.000)
Weekly earnings (*Rs.*)	2056 (1386)	731 (832)	1325 [903,1,747] (0.000)	2665 (1892)	1200 (996)	1465 [1,270,1,659] (0.000)	2333 (1549)	1022 (886)	1310 [1,119,1,502] (0.000)
Pre-pandemic earnings share	0.691 (0.453)	0.383 (0.418)	0.308 [0.11,0.51] (0.005)	1.025 (0.904)	0.653 (0.606)	0.372 [0.27,0.48] (0.000)	0.816 (0.588)	0.558 (0.543)	0.258 [0.16,0.35] (0.000)
Reduced essentials consumption	0.483 (0.502)	0.500 (0.512)	−0.017 [−0.25,0.22] (0.889)	0.406 (0.491)	0.449 (0.498)	−0.043 [−0.12,0.03] (0.250)	0.449 (0.498)	0.477 (0.501)	−0.028 [−0.11,0.06] (0.513)
Food insecurity index	0.264 (0.286)	0.364 (0.289)	−0.100 [−0.23,0.03] (0.147)	0.190 (0.266)	0.219 (0.282)	−0.029 [−0.07,0.01] (0.166)	0.188 (0.264)	0.231 (0.287)	−0.043 [−0.09,0.00] (0.074)
N	123	23	146	631	263	894	443	198	641

Table 5: **Sample characteristics by wave and gender, outside village only.**
Notes. *p*-values for t-tests on unpaired data with unequal variances.

	Males (mean)	Females (mean)	Difference	95% CIs		95% CIs (Bootstrapped)	
				Lower Bound	Upper Bound	Lower Bound	Upper Bound
Recovery Phase 1 (Jul '20)							
Outside village	0.103	0.040	0.063	0.040	0.087	0.039	0.087
Sector: Skilled labour	0.096	0.012	0.084	0.064	0.103	0.066	0.103
Sector: Unskilled labour	0.079	0.105	−0.026	−0.055	0.004	−0.054	0.001
Sector: Agriculture	0.460	0.490	−0.030	−0.080	0.020	−0.078	0.019
Unemployed	0.360	0.390	−0.030	−0.078	0.018	−0.079	0.018
Weekly earnings (Rs.)	445.599	294.995	150.604	41.034	260.174	−16.707	226.966
Pre-pandemic earnings share	0.160	0.182	−0.021	−0.065	0.022	−0.075	0.013
Reduced essentials consumption	0.611	0.725	−0.114	−0.160	−0.068	−0.160	−0.070
Food insecurity index	0.270	0.322	−0.052	−0.079	−0.024	−0.077	−0.021
Recovery Phase 2 (Jan '21)							
Outside village	0.525	0.456	0.070	0.020	0.119	0.023	0.117
Sector: Skilled labour	0.324	0.087	0.237	0.202	0.273	0.200	0.273
Sector: Unskilled labour	0.308	0.367	−0.059	−0.107	−0.011	−0.105	−0.014
Sector: Agriculture	0.116	0.122	−0.006	−0.039	0.027	−0.039	0.026
Unemployed	0.246	0.419	−0.172	−0.219	−0.125	−0.217	−0.128
Weekly earnings (Rs.)	1670.183	633.781	1036.402	895.734	1177.070	893.005	1177.458
Pre-pandemic earnings share	0.642	0.346	0.295	0.229	0.361	0.223	0.358
Reduced essentials consumption	0.445	0.474	−0.028	−0.079	0.022	−0.080	0.022
Food insecurity index	0.199	0.263	−0.064	−0.093	−0.035	−0.095	−0.036
Covid Wave 2 (Jun '21)							
Outside village	0.370	0.348	0.022	−0.026	0.070	−0.030	0.071

Table 6 (Continued)

	Males (mean)	Females (mean)	Difference	95% CIs Lower Bound	95% CIs Upper Bound	95% CIs (Bootstrapped) Lower Bound	95% CIs (Bootstrapped) Upper Bound
Sector: Skilled labour	0.241	0.047	0.194	0.164	0.224	0.164	0.225
Sector: Unskilled labour	0.203	0.298	−0.096	−0.140	−0.052	−0.140	−0.056
Sector: Agriculture	0.184	0.122	0.062	0.027	0.097	0.025	0.095
Unemployed	0.373	0.537	−0.164	−0.213	−0.114	−0.212	−0.116
Weekly earnings (Rs.)	1110.588	490.304	620.284	496.797	743.771	503.851	760.929
Pre-pandemic earnings share	0.402	0.279	0.123	0.068	0.178	0.067	0.179
Reduced essentials consumption	0.515	0.575	−0.060	−0.110	−0.011	−0.109	−0.009
Food insecurity index	0.208	0.262	−0.054	−0.082	−0.027	−0.081	−0.025

Table 6: **Sample characteristics by wave and gender - bootstrapped confidence intervals comparison.**
Notes. 95% confidence intervals in columns 6 and 7 generated using a non-parametric bootstrap with 1000 replications.

	Males (mean)	Females (mean)	Difference	95% CIs Lower Bound	95% CIs Upper Bound	95% CIs (Bootstrapped) Lower Bound	95% CIs (Bootstrapped) Upper Bound
Recovery Phase 1 (Jul '20)							
Sector: Skilled labour	0.034	0.007	0.027	0.014	0.040	0.015	0.042
Sector: Unskilled labour	0.058	0.087	−0.030	−0.057	−0.002	−0.058	−0.002
Sector: Agriculture	0.511	0.511	0.000	−0.051	0.052	−0.052	0.050
Unemployed	0.390	0.392	−0.001	−0.051	0.049	−0.054	0.051
Weekly earnings (Rs.)	242.533	276.243	−33.710	−138.167	70.747	−217.584	37.174
Pre-pandemic earnings share	0.097	0.173	−0.077	−0.119	−0.035	−0.129	−0.043
Reduced essentials consumption	0.626	0.734	−0.109	−0.156	−0.061	−0.157	−0.063
Food insecurity index	0.271	0.320	−0.049	−0.077	−0.021	−0.076	−0.018
Recovery Phase 2 (Jan '21)							
Sector: Skilled labour	0.140	0.029	0.111	0.077	0.146	0.077	0.146
Sector: Unskilled labour	0.179	0.106	0.073	0.027	0.120	0.025	0.118
Sector: Agriculture	0.227	0.219	0.009	−0.049	0.066	−0.048	0.074
Unemployed	0.447	0.643	−0.196	−0.263	−0.129	−0.266	−0.136
Weekly earnings (Rs.)	594.324	175.118	419.206	269.515	568.898	286.961	597.358
Pre−pandemic earnings share	0.232	0.109	0.123	0.072	0.174	0.073	0.176
Reduced essentials consumption	0.489	0.495	−0.006	−0.076	0.064	−0.074	0.060
Food insecurity index	0.210	0.298	−0.089	−0.128	−0.049	−0.131	−0.049
Covid Wave 2 (Jun '21)							
Sector: Skilled labour	0.086	0.019	0.068	0.043	0.092	0.042	0.093
Sector: Unskilled labour	0.124	0.141	−0.018	−0.060	0.025	−0.059	0.028
Sector: Agriculture	0.274	0.181	0.092	0.042	0.143	0.042	0.142
Unemployed	0.517	0.661	−0.145	−0.205	−0.085	−0.199	−0.086
Weekly earnings (Rs.)	403.150	201.896	201.254	73.484	329.024	72.154	330.498
Pre-pandemic earnings share	0.165	0.126	0.039	−0.016	0.094	−0.020	0.088
Reduced essentials consumption	0.553	0.629	−0.075	−0.136	−0.014	−0.137	−0.017
Food insecurity index	0.219	0.277	−0.058	−0.092	−0.024	−0.089	−0.023

Table 7: **Sample characteristics by wave and gender, inside village only - bootstrapped confidence intervals comparison.**
Notes. 95% confidence intervals in columns 6 and 7 generated using a non-parametric bootstrap with 1000 replications.

	Males (mean)	Females (mean)	Difference	95% CIs		95% CIs (Bootstrapped)	
				Lower Bound	Upper Bound	Lower Bound	Upper Bound
Recovery Phase 1 (Jul '20)							
Sector: Skilled labour	0.626	0.130	0.496	0.331	0.660	0.278	0.618
Sector: Unskilled labour	0.260	0.522	−0.262	−0.484	−0.039	−0.484	−0.052
Sector: Agriculture	0.016	0.000	0.016	−0.006	0.039	0.008	0.057
Unemployed	0.098	0.348	−0.250	−0.456	−0.044	−0.457	−0.041
Weekly earnings (Rs.)	2056.356	731.174	1325.182	903.060	1747.304	841.174	1689.874
Pre-pandemic earnings share	0.691	0.383	0.308	0.110	0.505	0.073	0.468
Reduced essentials consumption	0.483	0.500	−0.017	−0.249	0.215	−0.218	0.230
Food insecurity index	0.264	0.364	−0.100	−0.231	0.032	−0.227	0.032
Recovery Phase 2 (Jan '21)							
Sector: Skilled labour	0.493	0.157	0.335	0.275	0.395	0.276	0.396
Sector: Unskilled labour	0.427	0.689	−0.262	−0.331	−0.193	−0.329	−0.196
Sector: Agriculture	0.013	0.004	0.009	−0.003	0.021	−0.005	0.020
Unemployed	0.065	0.148	−0.083	−0.130	−0.036	−0.132	−0.041
Weekly earnings (Rs.)	2664.645	1199.984	1464.661	1269.867	1659.455	1266.608	1673.326
Pre−pandemic earnings share	1.025	0.653	0.372	0.266	0.479	0.265	0.479
Reduced essentials consumption	0.406	0.449	−0.043	−0.117	0.030	−0.119	0.029
Food insecurity index	0.190	0.219	−0.029	−0.070	0.012	−0.074	0.012
Covid Wave 2 (Jun '21)							
Sector: Skilled labour	0.505	0.102	0.403	0.340	0.466	0.335	0.460
Sector: Unskilled labour	0.337	0.599	−0.262	−0.343	−0.180	−0.340	−0.181
Sector: Agriculture	0.032	0.005	0.027	0.007	0.046	0.009	0.045
Unemployed	0.129	0.303	−0.174	−0.246	−0.103	−0.247	−0.107
Weekly earnings (Rs.)	2332.674	1022.178	1310.497	1119.166	1501.827	1135.447	1505.243
Pre-pandemic earnings share	0.816	0.558	0.258	0.163	0.354	0.172	0.349
Reduced essentials consumption	0.449	0.477	−0.028	−0.112	0.056	−0.116	0.056
Food insecurity index	0.188	0.231	−0.043	−0.090	0.004	−0.093	0.005

Table 8: Sample characteristics by wave and gender, outside village only - bootstrapped confidence intervals comparison.
Notes. 95% confidence intervals in columns 6 and 7 generated using a non−parametric bootstrap with 1,000 replications.

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