Migration and the Labor Market Impacts of COVID-19

Nathan Barker[1], C. Austin Davis[2], Paula López-Peña[3], Harrison Mitchell[4], A. Mushfiq Mobarak[1], Karim Naguib , Maira Emy Reimão[5], Ashish Shenoy[6*], and Corey Vernot[1]

[1]Yale University

[2]American University

[3]Queen's University

[4]University of California, San Diego

[5]Villanova University

[6]University of California, Davis

[*]Corresponding author. Email: shenoy@ucdavis.edu.

Abstract

Using detailed survey data, we document how migration-dependent households are especially vulnerable during the COVID-19 pandemic. We create new panel datasets for four populations in Bangladesh and Nepal extending from before the pandemic through June 2020. Leveraging experimental and observational variation in prior migration dependence, we report 15–25% greater declines in earnings and fourfold greater prevalence of food insecurity among migrant households in the first few months of the pandemic. Earnings declines are driven primarily by lost remittance income that far exceeds what is reported in official statistics. Moreover, migration linkages generate a divergence between disease prevalence and economic fallout from COVID-19. We demonstrate the worldwide extent of vulnerability through migration dependence in a large set of secondary data and conclude with recommendations for policy targeted at economic recovery.

JEL Codes: O15, J61, I32

Keywords: COVID-19, Migration, South Asia

1 Introduction

COVID-19 is primarily spread through face-to-face contact, and therefore reduced mobility has been a salient feature of the policy response to the pandemic. The link between public health, mobility, and economic wellbeing merits special focus because migration is such an important characteristic of the global economy. An estimated 272 million people live outside their country of birth, of which 192 million come from regions classified as "less developed" (UNDESA, 2019). Direct remittances from these migrants to low- and middle-income countries (LMICs) in 2018 reached nearly $500 billion, triple the flow of official development assistance and roughly 80% as much as foreign direct investment. Internal migration is even more prevalent with an estimated 763 million internal migrants worldwide, two-thirds of whom reside within LMICs (UNDESA, 2013). Migration is closely tied to households' immediate financial prospects as well as long-term economic development and urbanization.

In this paper, we document the effect of COVID-19 on migrant populations in South Asia using new survey data from the early months of the pandemic. This region saw a mass return of migrants since the onset of the pandemic, with India alone repatriating 3 million of its citizens in 2020. An estimated 200,000 Bangladeshis returned to the country early in 2020, before borders closed, and another wave of 400,000 citizens returned once borders reopened. The Government of Nepal similarly repatriated over 200,000 migrant workers in its pandemic response, with another 500,000 returning from across the Indian border. (IOM 2021a; OECD/ADBI/ILO 2021)

Within-country movement has been comparably large. Between March and May 2020, an estimated 10 million Indian domestic migrants returned home in early 2020 (e.g. Roy and Agarwal, 2020), and our own survey data from Bangladesh suggests one quarter of low-skill construction workers in major cities returned to their towns of origin between March 1 and June 15, 2020. The urban construction sector employs 8.8% of all working males (UNFPA, 2016), meaning this loss of employment alone represents a substantial portion of the population. The mass return of urban labor is corroborated by rural surveys, where 65% of households report having a migrant return between March 15 and May 15 in 2020 compared to just 10% over the same period in 2018 and 2019.

We report how migration-dependent households have been especially economically vulnerable during the pandemic using household survey data from four South Asian populations. While household income has declined throughout our populations of study, we find this decline to be 15–25 percentage points greater among households that rely on migration income. A large fraction of this heightened impact is driven by remittance income, which has fallen 65 percent. This loss of income has translated directly into wellbeing, as migration-dependent households are nearly 20 percentage points more likely than non-migrants to report

food insecurity in the early days of the pandemic.

Our findings contribute to the emerging understanding of how populations are differentially impacted by the pandemic and provide guidance for targeting resources for economic relief. Neglecting the unique distress of migration-dependent households near the subsistence threshold may create its own nutritional crisis. Moreover, in the absence of financial relief, the strong incentive to migrate can hinder compliance with travel directives. If households feel they have no option but to send a migrant for income, they may make decisions that accelerate the development and spread of new variants in origin and destination areas before the reach of vaccination efforts.

The results in this paper complement existing empirical findings on the exposure of migrants during COVID-19. A number of studies have shown economic contraction in OECD countries to be concentrated among occupations and industries high in migrant labor (Garrote Sanchez et al., 2020; Fasani and Mazza, 2020; Gelatt, 2020; Kerwin et al., 2020; Borjas and Cassidy, 2020). As a result, there was a sharp global reduction in official remittances Q2 2020, in the months immediately following the pandemic's global spread (World Bank, 2020b). These statistics describe effects on medium- or long-term transnational migration at their workplace, while our research focuses on household conditions among populations with high fractions of short-term and subnational or intraregional migrants.

We extend the empirical literature along three dimensions. First, we use household surveys to reach populations often excluded from official statistics. Deaton (2005), among others, discusses shortcomings of official statistics when informal labor is common. We document the high prevalence of short-term migration of a single household member across a range of development contexts. These migrants, who frequently engage in informal labor and carry cash by hand, are unlikely to appear in official employment or remittance numbers. Second, we focus on migrants traveling either domestically or to other developing regions rather than to OECD destinations. Third, our results verify that previously documented labor market effects of COVID-19 have impacted household wellbeing, indicating that migration-dependent households were particularly poorly insured against such a large, ubiquitous, and unanticipated earnings shock.

Beyond the main result, we uncover three novel facts about the nature of migrants' economic exposure. First, we document declines in remittance earnings far greater than those seen in official statistics. Even among international migrants in Bangladesh, the year-on-year fall in remittance earnings in Q2 2020 in survey data exceeds that reported in the World Bank's KNOMAD database by over 60 percentage points. This discrepancy calls into question prominent reports from many nations that remittance flows recovered in Q3 2020 and beyond to above their 2019 levels. We urge caution in interpreting this recovery, especially in settings where informal remittances represent a substantial fraction of financial flows.

Second, to the extent there is an uptick in remittance income in Q3 2020 and beyond, we present evidence

it is generated by displacement of future earnings rather than economic recovery. In our data, much of the remaining remittance income during this period is contributed by migrants returning home at abnormally high rates and bringing cash by hand. These returnees do not subsequently remigrate as they would have in previous years, leading to lower overall rates of household members away. With this regular stock of migrants depleted, households that depend on remittance income can expect lower earnings in the future, meaning the economic fallout from the pandemic may persist after the heath risk has abated. Our results are in line with the World Bank 2020a forecast of only a modest 5.2% recovery in global remittances in 2021 following a 19.9% decline in 2020.

Third, we show how migration linkages can drive a wedge between the epidemiological and economic impacts of the pandemic. Among household earners, disease prevalence at the destination labor market is a stronger predictor of earnings decline than home disease prevalence. While migration has proven to be a vector of disease spread (Ahsan et al., 2020; Valsecchi, 2020), we find migration can induce additional diffusion of economic contraction over and above its effect through health that further threatens livelihoods. As a result, the optimal targeting of resources for economic recovery may differ from local medical need.

The primary data for this research draws on phone surveys among three populations in Bangladesh and one in Nepal following the COVID-19 outbreak. In Bangladesh we survey former applicants to a visa lottery program, landless agricultural households in a high-migration rural region, and casual day laborers at major urban markets; and in Nepal we survey low-income households in a high-migration rural region. These survey samples were selected based on their prior involvement in ongoing research, and are therefore statistically representative of their underlying populations.

The link to prior research enables a difference-in-differences study design using pre-COVID data. We define migration dependence based on household behavior before the pandemic, and then test whether changes in economic outcomes vary with migration dependence. The key identifying assumption is that differences in outcomes would have remained stable were it not for the global pandemic. In the case of the visa lottery sample, this assumption follows from the random allocation of migration visas. In two other populations—the rural samples from Bangladesh and Nepal—we present evidence of prior parallel trends in a monthly panel of household food security. Where possible, we report year-on-year changes to account for seasonal variation.

A drawback of this research design is that post-COVID phone surveys were of limited duration to ensure completion, and the studies were unrelated before the pandemic. Phone questionnaires were adjusted by sample to maximize comparability to prior data, and hence, not all outcomes are harmonized or available for all samples. Nevertheless, we present some of the only randomly sampled household-level data available from this period and region, and demonstrate a consistent pattern of heightened economic distress among

migration-dependent households.

This work most directly contributes to research on the impact of COVID-19 in developing countries. Egger et al. (2021); Josephson et al. (2021) report ubiquitous declines in economic wellbeing across a number of low- and middle-income countries using household survey data[1]. These economic impacts compound well-documented disparities in health outcomes during the pandemic, especially among low-income populations (e.g. Garg et al., 2020; Barnett-Howell and Mobarak, 2020). We extend existing findings by identifying a large subpopulation that is particularly economically vulnerable.

Our results complement other findings of disparate pandemic impacts based on labor market characteristics. In addition to research on migration, the capacity for occupations to accommodate working from home mediates labor outcomes in a way that can exacerbate existing wealth gaps (Dingel and Neiman, 2020; Saltiel, 2020; Gottlieb et al., 2020). We use high quality microdata to show that these labor market effects documented at the workplace are transmitted into household consumption and welfare.

More broadly, this research contributes to the understanding of the role of migration in household wellbeing. A small number of experimental evaluations find high earnings returns to both domestic and international migration, on the order of 50–250%(McKenzie et al., 2010; Bryan et al., 2014; Akram et al., 2017; Shrestha et al., 2020; Clemens and Postel, 2017; Barker et al., 2020). Other estimates using panel fixed-effects (Hendricks and Schoellman, 2017; Alvarez, 2020; Hamory et al., 2020; Lagakos et al., 2020) suggest returns may be more moderate after accounting for worker characteristics. We find that during the pandemic, there is a substantial loss in migration earnings relative to non-migrant earnings that is not compensated or recovered at home.

In Section 2 of this paper we describe the main methodology and various sources of data we draw upon. Section 3 describes labor migration prior to the outbreak. Section 4 presents our main findings on the heightened economic impacts of COVID-19 on migrant households and explores channels of transmission. We conclude in Section 5 by discussing policy lessons for economic recovery.

2 Data and Methodology

We present new evidence on how COVID-19 and associated policies restricting movement and physical proximity have differentially affected households that rely on migration income. For this, we combine new phone survey data with existing records among three sample populations in Bangladesh and one in Nepal. All four samples were selected based on participation in prior research by the authors of this paper, which allows us to control for pre-existing economic status, and are statistically representative of their underlying

[1]Some of the data in this paper also contributed to results presented by Egger et al. (2021)

populations. Data collection from each of these studies was either ongoing or complete by February 2020.

We re-contacted participants from each sample by phone in April–June 2020 with questions about recent travel, health symptoms, earnings and financial distress, and social distancing measures. Surveys were restricted to twenty minutes to ensure completion. While this time constraint limited the scope of data collection, we present some of the only direct survey evidence generated by random sampling in this region during the early months of the pandemic.

The four study samples are summarized in Table 1, with further details in Appendix A:

Bangladesh–Malaysia Visa Lottery (G2G): The Government-to-Government (G2G) visa lottery study consists of Bangladeshi individuals who applied for a work visa for Malaysia in 2013. Due to oversubscription, visas were awarded by lottery to 30,000 of the nearly 1.5 million applicants. Visas were allocated by lottery, so this sample provides experimental variation in the propensity to migrate, with visa lottery winners 58 percentage points more likely to have a household member migrate internationally in the subsequent five years. A random sample of 3,512 households representing lottery winners and losers were surveyed in person in August–December 2018, and we reached 2,896 of these by phone in 2020. Migration-dependent households in this sample are those that were awarded a visa in the lottery. Details of the original study are discussed in Shrestha et al. (2020).

Nepal Rural Communities (NPL): The Nepal Seasonality (NPL) study consists of 1,820 households selected from the bottom half of the wealth distribution in multiple wards of the Western Terai region of Nepal. We construct a household panel of 1,419 households from six rounds of phone surveys between August 2019 and June 2020, with the latter rounds including COVID-specific questions. Migrants from this region predominantly either remain within Nepal or travel to India. We define migration-dependent households to be those that described remittances as their primary source of earnings in 2019. Details of the original study are discussed by Mobarak and Vernot (2020).

Bangladesh Landless Agricultural Workers (NLS): The No Lean Season (NLS) study experimentally evaluates a large-scale program to offer seasonal migration loans to landless agricultural workers in Northern Bangladesh. Migrants from this region most frequently travel seasonally in October–December and April–May, and typically head to destinations within Bangladesh. The NLS program offered migration loans to 150,000 households in 2018, and a random sample of 4,324 eligible households drawn from both offered and non-offered populations were surveyed in person once in March and again in June 2019. We contacted a random sample of 294 households from this sampling frame by phone in 2020, stratified by prior migration status. Migration-dependence in this sample is defined as having a temporary migrant away from the household in at least one of the previous three years.[2] Details of the original study are discussed by Bryan

[2]Experimental variation generated by the original study could not be used in this paper because the program had little effect on

et al. (2019).

Bangladesh Urban Labor Markets (URB): The Urban Labor Market (URB) survey consists of workers at over two hundred labor markets in nine major cities in Bangladesh. Workers are primarily urban residents found at spot markets awaiting solicitations for short-term manual labor opportunities, most commonly in the low-skill construction sector. We identified 19,396 workers in September 2018 prior to the short-term migration season, conducted a followup survey with 8,490 of them by phone in April 2019, and contacted 2,682 of them by phone again in May 2020. Migrants in this population are defined as those who identified their native home to be a location outside the labor market sub-district, indicating they are recent arrivals to the city.

[Table 1 about here.]

2.1 Methodology

We employ a difference-in-differences estimation strategy separately in each study sample. The main estimating equation is

$$Y_{it} = \beta M_i \times C_t + \gamma_i + \delta_t + \epsilon_{it} \tag{1}$$

where Y_{it} represents an outcome Y for respondent i at time t, M_i is a dummy representing pre-COVID migration dependence, C_t is a dummy for post-COVID, and γ_i and δ_t represent respondent and time fixed effects, respectively. The coefficient of interest β is the difference-in-differences estimate of the differential impact of COVID-19 on migration-dependent households.

These research initiatives were unrelated before COVID-19, so outcomes are not harmonized or consistently available across samples. Our primary outcome of household earnings is measured in the G2G and NPL samples, and individual worker earnings in URB. In the G2G and NPL samples, we further break down household earnings by source to isolate the impact of remittances.

As a second measure of household wellbeing, we present results on monthly self-reported food security in the NPL and NLS samples. Pre-pandemic food security was elicited in a 12-month retrospective survey during the June 2020 phone survey in the NPL sample and during in-person surveys in March and June 2019 in the NLS sample. We provide further evidence on the nature of the economic shock using the timing of migrant departures and returns in these samples as well. A full data description is provided in Appendix A.

Identification relies on the assumption that outcomes for migration-dependent respondents would have followed the same trend as those of non-migration-dependent respondents were it not for the pandemic. In

new migration.

the G2G lottery, migration dependence is assigned randomly so this assumption is satisfied by design. In two other samples—NPL and NLS—we verify that food insecurity follows parallel trends in pre-pandemic years.[3] Where possible, we compare post-COVID outcomes to data from the same month in prior years to avoid confounding trends introduced by seasonality.

Survey non-response poses a further threat to identification due to the difficulty of reaching respondents by phone during a period of crisis. Of those called, 82% responded in the G2G sample, 79% in the NPL sample, 76% in the NLS sample, and 72% in the URB sample during the post-COVID data collection. In Appendix Table S2 we show that post-COVID survey respondents match their respective sampling frames on pre-COVID characteristics, and there is no differential attrition by prior migration status.

3 Background

Our four study populations represent a range of common migration types. The G2G sample in Bangladesh comprises primarily transnational migrants, with most lottery winners traveling to Malaysia. A small fraction of lottery losers also secure alternate work abroad in South Asia, Southeast Asia, or the Middle East. Such medium-term international migration is highly prevalent in the developing world. Of the estimated 192 million emigrants from less developed nations, just over half take up residence in other less developed nations and almost 60 million remain within their subregion of birth (UNDESA, 2019). It is important to understand how COVID-19 has affected workers and households along these South-South migration channels.

By contrast, migration in the NLS sample in Bangladesh is almost entirely short-term and seasonal. Migrants from these households typically travel for one to two months during the agricultural lean season, and nearly all remain within the country. The majority of migrants in the NPL sample from Nepal similarly either remain within Nepal or travel to neighboring India, with whom the country shared a nearly open border. This type of subnational and regional migration is estimated to be far more prevalent globally than international migration, with almost 500 million domestic migrants in less developed regions of the world (UNDESA, 2013).

Among domestic migrants in LMICs, short-duration seasonal travel is a fundamental component of household earnings. Figure 1 plots the annual share of households that participate in temporary migration—lasting under 12 months—for several populations where data is available. The calculations draw from multiple sources including both targeted research surveys and nationally representative samples collected by statistical offices, summarized in Appendix Table S1. Importantly, data include detailed information

[3] Unfortunately, we lack pre-pandemic data in the appropriate season to test for parallel trends in the URB population.

on episodes of short-term and circular migration, as well as cases where individuals migrate while the household remains behind.

Figure 1 illustrates three important features of short-term migration. First, it is extremely common in the LMIC countries for which we have data. Among populations in Asia, Africa, and Latin America, between one fifth and half of households send at least one member away for work temporarily. Where possible, we use national surveys to show such migrant households make up a substantial fraction of the national population. By contrast, the annual rate in the United States is below 0.2%.

Second, short-term migration within LMICs is concentrated among identifiable populations and regions, especially those that are poor and rural. In Nepal, India, and Uganda, where data on rates among the general population are available, we identify sub-populations for whom the rate of migration is up to fourfold the national average.[4] That is, identifiable locations and sectors are at even greater risk.

Third, short-term migration is frequently seasonal, especially among rural populations. The first three rows of Figure 1 report departure rates during the peak migration season in rural Nepal, Northern Bangladesh, and Central India.[5] Peak-season migration accounts for more than half of overall short-term migration in these populations.[6] This fact suggests that, in addition to targeting specific populations, economic policy for migrants should be appropriately timed throughout the year.

[Figure 1 about here.]

Finally, the URB sample in Bangladesh consists of urban residents employed in low-skill labor, the majority of whom migrated from rural areas in their lifetime. 85% of respondents identify a different subdistrict and 79% a different district from the labor market where they were interviewed as their native place. Rapid urbanization has been a recent trend throughout the developing world. The fraction of the population in LMICs living in urban areas has grown by 25% over the last twenty years (World Bank, 2020c), leading to a swell in urban workers with roots outside the city.

This newly urban population is characterized by frequent short-term mobility as well. Recent urban arrivals frequently move between markets to find short-term wage work, and often travel to visit extended family. Six months after the initial survey, more than half of URB respondents located in a new urban market, and 50% reported traveling to visit their native home at least once in September–December 2018. These are the most vulnerable urban workers without a steady or guaranteed source of income.

Migrant income is a meaningful contributor to household earnings across our study samples. Among

[4]By contrast, in the U.S., short-term migration is not substantially more common than the national average among any region, education category, or any specific non-military industry or occupation.

[5]Data from the other sources do not indicate departure timing.

[6]By comparison, in the United States there is no single month where departures exceed ten percent of the annual rate; migration is distributed evenly throughout the year.

G2G lottery-winning households, remittances comprised 33% of average income in 2018 for the family remaining in Bangladesh, and 63% when the visa holder was still abroad. In the NLS sample, migrant earnings accounted for 18% of total earnings over the seven-month period from October 2018 to May 2019, concentrated during times of low rural earnings capacity. Among NPL households, remittances brought home by returnees during the October–November 2019 rice harvest made up 60% of household labor income in those months despite it being a time of high agricultural productivity. An unanticipated loss of such a substantial portion of earnings could spell economic disaster for these households.

Experimental evidence indicates high returns to migration. Relevant to the current study, Shrestha et al. (2020) estimate income doubles for households in the G2G population that send a migrant to Malaysia after winning a visa lottery. In a pilot of the NLS migration loan experiment, Akram et al. (2017) find household earnings rise by 50% over the following six months for those induced to send a migrant by receiving a migration loan. This benefit is directly observed in food consumption, with NLS migrant households consuming 750 more calories per person per day during the agricultural lean season (Bryan et al., 2014). These findings suggest that migrant households would be unlikely to recover lost income using local sources even in normal economic times.

4 Results

While COVID-19 has been economically disruptive worldwide, we observe disproportionately large declines in earnings and food security among migrant households. Migration-dependent households experience a 25% greater loss in earnings on average, and are 20 percentage points more likely to face food insecurity in the early months of the pandemic. These gaps are driven largely by loss of remittance earnings, caused by both lower rates of migration and less remittance income from remaining migrants. We measure declines far exceeding what has been recorded in official statistics. Evidence suggests that migration linkages contribute to economic distress over and above their role in spreading disease. Our findings highlight migration as a unique and potentially underreported channel of economic exposure to the global downturn.

4.1 Effects on Income and Food Security

Across all four survey samples, we consistently find the COVID-19 economic shock to have hit migrant households especially hard. We first investigate this question using randomized variation among participants in the G2G visa lottery. Monthly income fell 36% from Spring 2019 to April 2020 on average in this sample. Panel A of Figure 2 shows that lottery winners, who are 58% more likely to have a migrant

household member than lottery losers, enjoyed higher earnings on average prior to COVID-19 but have experienced a 22% greater decline in earnings ($p< .05$) since the onset of the pandemic. The frequency of reporting no earnings from any source in April 2020 is nearly twice as high ($p< .01$) among lottery winners (10.2%) than lottery losers (5.4%), compared to a rate of 1.3% among both groups in 2019. Results are robust to including household fixed effects, and are consistent when using both recall data on earnings in Spring 2019 and contemporaneous survey data from April 2018; all regression results are presented in Appendix C.

A similar pattern appears in the NPL sample, shown in Panel B. Comparing labor income from the April 2020 wheat harvest to the October 2019 rice harvest, the most comparable prior period for which we have earnings data, households that reported remittances as their primary source of income in 2019 have higher earnings at baseline but experience a 14% greater drop during the pandemic, though the difference is not statistically significant. This differential decline reflects excess vulnerability among migration-dependent households relative to the 52% average drop in earnings observed in this sample.

We next show evidence that these declines in earnings translate into heightened food insecurity for migrant households. This measure, which tends to be more stable over time as households smooth consumption, verifies the observed shocks represent real economic distress rather than temporary displacement of insurable household income.

In the NLS sample, a substantial gap in food security appears between migrant and non-migrant households after the outbreak of COVID-19. We plot the fraction of households reporting restricted food intake for more than half the month in Panel C, split by presence of a migrant in the previous three years. Prior to 2020, with data spanning January 2018 to June 2019, rates of food insecurity are nearly identical between households with and without migrants. The largest gap of 4–6 percentage points appears during the September–October lean season. Food insecurity in 2020 follows this pattern in January and February, but spikes among migrant households in March and April. Food insecurity among migrant households in April 2020 exceeds 30%, surpassing the typical lean season peak of 25%. Increases among non-migrant households are much more modest, leading to an eighteen percentage point gap in food insecurity between migrant and non-migrant households during the pandemic period. We reject that the post-COVID migrant–non-migrant difference is equal to prior years ($p< .01$), to January and February 2020 ($p< .01$), and to the prior lean season peak ($p< .05$).

Similar disparities appear in the NPL sample. Panel D of Figure 2 plots the average value of an index of food insecurity in late 2019 and early 2020 compared to prior years in the NPL sample. The gap between high- and low-remittance households exceeds two standard deviations, and the rate of food insecurity among migrants in May–June resembles a typical lean season. We again reject that the post-COVID migrant–non-migrant difference is comparable to prior years ($p< .01$), to the October 2019 harvest ($p< .01$), to the

November–December 2019 post-harvest ($p < .05$), and to the prior lean season peak ($p < .05$).

[Figure 2 about here.]

4.2 Lost Income and Remittances

Where we have data on sources of earnings, we document substantial declines in remittance earnings consistent with heightened vulnerability of migrant populations. Panel A of Figure 3 shows the change in earnings by source in the G2G sample from April 2018 to April 2020.[7] Among visa lottery winners, remittances account for 83% of lost income, and lost remittances alone equal the total decrease in earnings among lottery losers. Even among lottery losers, loss of remittance income makes up 39% of the earnings decline as many relied on alternative migration channels prior to the pandemic.

[Figure 3 about here.]

The role of remittances is even more stark in the NPL sample, where the majority of the population relies on external income. Remittance earnings in April 2020 (during the wheat harvest) are 65% lower than during the 2019 rice harvest, shown in Panel C. Remittance earnings account for 74% of the decline in labor income among households who identify remittances as their primary source of income and for 67% of the decline among households who identify a different primary source.

Notably, our survey measures of household remittances reveal declines that far exceed those documented in official statistics. We measure average decreases of 67% in the G2G sample and 65% in the NPL sample, compared to respective 5% and 0% national declines in Q2 of 2020 reported by the World Bank's KNOMAD database (2020b). In both survey settings, informal cash transfers make up a significant fraction of earnings. Since such transfers rarely appear in aggregate statistics, official country-level measures are likely to be unreliable indicators of household wellbeing or recovery.

Lost remittance income can be attributed to both a lower rate of migration as well as depressed migrant earnings. Panels D and E break remittances down into these components in the NPL sample. Only 23% of households had a male[8] member away during the May 2020 wheat harvest, below the typical annual nadir of 26% during the autumn rice harvest. Moreover, even migrants who remained away in this period earned far less than normal. Monthly earnings per migrant fell by 56% from \$126 USD PPP in autumn 2019 to \$55 USD PPP in April and May 2020. These differences are statistically significant ($p < .01$) and robust to controlling for household fixed effects.

[7] We lack such granular data for April 2019.

[8] Labor migrants in this region are overwhelmingly male.

Data on individual earnings from the URB sample indicate that migrants workers experienced greater income losses than comparable non-migrants even within the same industry and occupation. Among urban spot-labor construction workers, earnings were nearly 74% lower in May 2020 relative to the prior year. However, the decline was 15% greater for workers who did not consider the labor market to be their native home ($p< .01$). This result, shown in Panel B of Figure 3, is robust to including worker fixed effects and to considering earnings from other times of year. Our finding complements existing evidence that migrants are more likely to work in sectors that experienced greater economic contraction.

Even our survey numbers likely understate the full economic impact for two reasons. First, informal remittances typically peak as returning migrants bring back earnings by hand. Therefore, some of what we measure in April–June 2020 as remittance income may reflect displaced future earnings if migrants were forced home unexpectedly early. Second, in the NPL data, we do not observe an uptick in migration post-harvest as would be predicted by previous seasons (Panels C and D of Figure 3), suggesting that those forced home at the start of the pandemic were not subsequently able to return to their place of work.

Both factors presage further economic vulnerability through the duration of the pandemic, and the stark difference in food insecurity reinforces the conclusion that migration-dependent households consider their lost income to be more than transitory. Our results therefore caution against treating the bounce-back in official remittances seen in Q3 of 2020 and beyond as evidence of economic recovery in developing settings where transfers are predominantly informal.

4.3 Migrants and Local Market Conditions

Our results indicate migration contributes to economic distress independent of its role in disease transmission. Labor migrants face particularly high risk of exposure in transportation—over 95% of NLS migrants traveled on a high-density vehicle such as bus or train—and housing—95% of NLS migrants shared sleeping quarters with at least three other individuals and 40% slept in rooms with 10 or more workers. Phone survey data, which include syndromic surveillance of symptoms associated with COVID-19, are consistent with prior findings that migration is a vector of disease spread. The likelihood of self-reporting a COVID-19 symptom as identified by the WHO/CDC in early 2020—fever, dry cough, or fatigue—doubles from 7% to 14% in the G2G sample when an international migrant has returned in the previous two weeks, and is 20% greater in households with a recent domestic returnee in the NLS sample. Note that these are simple differences, not difference-in-difference results, and we cannot quantify whether return migrants have elevated disease symptoms during non-pandemic times.

Nevertheless, we find migration linkages to be a strong predictor of economic outcomes even after

controlling for their role in local disease prevalence. Table 2 presents results from a regression of urban workers' pandemic decline in earnings on disease prevalence[9] in their home and destination labor markets. The first column indicates that economic distress increases with disease prevalence in a worker's place of residence in June 2020. However, the next three columns show this relationship disappears after controlling for disease prevalence at the individual's place of work prior to the pandemic. The final column confirms that this effect is unique to place of work; disease prevalence at a worker's native home does not predict economic distress. These results indicate that even though migration may contribute to the spread of COVID-19, pre-pandemic migration linkages transmit economic distress over and above their epidemiological role. As a consequence, those in need of resources for economic recovery may be distinct from those facing the greatest disease burden.

[Table 2 about here.]

The observed income and consumption shocks reveal households are unable to recover lost migration income in local labor markets. We find direct evidence of lower market participation among return migrants in the NPL sample. Hours devoted to wage labor declined across the entire sample after COVID-19, but the decrease was twice as large for those who had traveled in the previous six months. While there was some substitution toward home enterprises, this alternative made up for less than 50% of the gap.

A number of other indicators in the G2G sample are consistent with isolation of returnees. Households are four times more likely to report exclusion from social events (relative to a base of 3%) and three times more likely to report exclusion from prayers (from a base of 6%) due to COVID-19 if they have a returning migrant in the prior two weeks. Indirect responses corroborate diminished community participation. Visa lottery winners were 25% (nine percentage points) less likely to attend Friday prayer services than lottery losers. This difference is not driven by religiosity as rates of prayer are equal across the two groups; the discrepancy only arises at the typical community gathering time. Without pre-COVID data, we cannot determine whether such isolation is typical of returning migrants or unique to the current pandemic due to fear of disease. In either case, it hinders reintegration at a time when migrants are most vulnerable.

5 Discussion

In this paper we document how the economic centrality of migration left households uniquely vulnerable to both the public health crisis and economic downturn during the early months of the COVID-19 pandemic. This finding is important due to the fundamental role of labor mobility in earnings in much of the developing

[9]Data on district-level case rates are reported by the Institute of Epidemiology Disease Control And Research, Bangladesh.

world. Our results highlight an especially vulnerable segment of the population that may merit specific policy focus during economic recovery.

Across four different samples in Bangladesh and Nepal, we find households with migrant laborers to have faced greater income losses than their non-migrant counterparts. These samples span a broad range of migration modes, containing both domestic and international migrants engaging in both seasonal and longer duration migration. Migrant households were unable to make up lost earnings in local labor markets, and instead faced heightened rates of food insecurity representing acute economic distress.

Acute distress may persist over time as households forego profitable investment in future earnings in order to smooth current consumption. In survey data, we observe elevated rates of return migration with few subsequent departures, foreshadowing depressed levels of future migration earnings. Over the longer term, nutritional deficits can hinder child development in ways that limit adult earnings capacity, transmitting the economic fallout from COVID-19 across generations (see Nandi et al., 2017; McGovern et al., 2017). Public policy therefore not only needs to address the immediate needs of remittance-dependent families, but also such longer-term vulnerabilities created by the pandemic that may persist beyond the public health component of the crisis.

The findings from this research provide guidance for how policymakers should target resources for economic recovery in the wake of the global pandemic. Most directly, recognizing labor migration as a key source of vulnerability entails targeting resources to households, regions, and times of year where migration is most prevalent.

In highlighting this demographic, we report losses in remittance income substantially greater than those recorded in official statistics. Accurate measurement of earnings is especially challenging for domestic migrants who commonly transport cash by hand. This discrepancy between administrative and survey data reinforces the importance of conducting direct surveys, such as Innovations for Poverty Action's RECOVR project, to monitor household wellbeing in settings where informal income is common.

Finally, we reveal a divergence between epidemiological and economic need during the pandemic. While migration acts as a vector to transmit infection across space, we report economic contagion through migration linkages over and above what would be predicted by COVID-19 case rates alone. This finding calls for a decoupling of public health and economic resources, as even areas with low disease prevalence may face economic difficulty if they are connected to more infected regions through labor markets.

References

Ahsan, Reshad, Kazi Iqbal, Mahreen Khan, Ahmed Mushfiq Mobarak, and Abu Shonchoy, "Using Migration Patterns to Predict COVID-19 Risk Exposure in Developing Countries," Yale Research Initiative on Innovation & Scale 2020.

Akram, Agha Ali, Shyama Chowdhury, and Ahmed Mushfiq Mobarak, "Effects of Emigration on Rural Labor Markets," NBER Working Paper 23929 2017.

Alvarez, Jorge A., "The Agricultural Wage Gap: Evidence from Brazilian Micro-data," *American Economic Journal: Macroeconomics*, January 2020, *12* (1), 153–73.

Banerjee, Abhijit, Esther Duflo, Nathanael Goldber, Dean Karlan, Robert Osei, Parienté, Jeremy Shapiro, Bram Thuysbaert, and Christopher Udry, "A multifaceted program causes lasting progress for the very poor: Evidence from six countries," *Science*, 2015, *348* (6236).

Barker, Nathan, Gharad Bryan, Dean Karlan, Angela Ofori-Atta, and Christopher Udry, "Escaping Poverty: Comparing Livelihood Approaches for the Ultra-Poor in Ghana," AEA RCT Registry ID AEARCTR-0003638 2020.

Barnett-Howell, Zachary and Ahmed Mushfiq Mobarak, "Should Low-Income Countries Impose the Same Social Distancing Guidelines as Europe and North America to Halt the Spread of COVID-19?," Yale Research Initiative on Research & Scale 2020.

Baseler, Travis, "Hidden Income and the Perceived Returns to Migration: Experimental Evidence from Kenya," 2020. mimeo.

Borjas, George J and Hugh Cassidy, "The Adverse Effect of the COVID-19 Labor Market Shock on Immigrant Employment," NBER Working Paper 27243, National Bureau of Economic Research May 2020.

Bryan, Gharad, Ahmed Mushfiq Mobarak, Karim Naguib, Maira Reim ao, and Ashish Shenoy, "No Lean Season 2017-2019 Evaluation," AEA RCT Registry ID AEARCTR-0002685 2019.

_ , Shyamal Chowdhury, and Ahmed Mushfiq Mobarak, "Underinvestment in a Profitable Technology: The Case of Seasonal Migration in Bangladesh," *Econometrica*, 2014, *82* (5), 1–43.

Clemens, M.A. and H. Postel, "Temporary work visas as US-Haiti development cooperation: a preliminary impact evaluation," *IZA Journal of Labor and Development*, 2017, *6* (4).

Deaton, Angus, "Measuring Poverty in a Growing World (or Measuring Growth in a Poor World)," *Review of Economics and Statistics*, 2005, *87* (1), 1–19.

Dingel, J. and B. Neiman, "How Many Jobs Can be Done at Home?," *COVID Economics: Vetted and Real-Time Papers*, 2020, *1*, 16–24.

Egger, Dennis, Edward Miguel, Shana S. Warren, Ashish Shenoy, Elliott Collins, Dean Karlan, Doug Parkerson, A. Mushfiq Mobarak, Günther Fink, Christopher Udry, Michael Walker, Johannes Haushofer, Magdalena Larreboure, Susan Athey, Paula Lopez-Pena, Salim Benhachmi, Macartan Humphreys, Layna Lowe, Niccoló F. Meriggi, Andrew Wabwire, C. Austin Davis, Utz Johann Pape, Tilman Graff, Maarten Voors, Carolyn Nekesa, and Corey Vernot, "Falling Living Standards during the COVID-19 Crisis: Quantitative Evidence from Nine Developing Countries," *Science Advances*, 2021, *7* (6).

Fasani, Francesco and Jacopo Mazza, "Immigrant Key Workers: Their Contribution to Europe's COVID-19 Response," IZA Policy Paper 155 2020.

for Migration (IOM), International Organization, "Returnee SITREP: Number of Bangladeshi Migrants - Returned due to COVID-19, April-December 2020," 2021a. April 01.

Garg, Shikha, Lindsay Kim, Michael Whitaker, Alissa O'Halloran, Charisse Cummings, Rachel Holstein, Mila Prill, Shua J. Chai, Pam D. Kirley, Nisha B. Alden, Breanna Kawasaki, Kimberly Yousey-Hindes, Linda Niccolai, Evan J. Anderson, Kyle P. Openo, Andrew Weigel, Maya L. Monroe, Patricia Ryan, Justin Henderson, Sue Kim, Kathy Como-Sabetti, Ruth Lynfield, Daniel Sosin, Salina Torres, Alison Muse, Nancy M. Bennett, Laurie Billing, Melissa Sutton, Nicole West, William Schaffner, H. Keipp Talbot, Clarissa Aquino, Andrea George, Alicia Budd, Lynnette Brammer, Gayle Langley, Aron J. Hall, and Alicia Fry, "Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 — COVID-NET, 14 States, March 1–30, 2020," *Morbidity and Mortality Weekly Report*, 2020, *69*, 458–64.

Gelatt, Julia, "Immigrant Workers: Vital to the U.S. COVID-19 Response, Disproportionately Vulnerable," Technical Report, Migration Policy Institute 2020.

Gottlieb, Charles, Jan Grobovsek, and Markus Poschke, "Working form home across countries," *COVID Economics: Vetted and Real-Time Papers*, 2020, *8*, 71–91.

Hale, Thomas, Sam Webster, Anna Petherick, Toby Phillips, and Beatriz Kira, "Oxford COVID-19 Government Response Tracker," 2020.

Hamory, Joan, Marieke Kleemans, Nicholas Y Li, and Edward Miguel, "Reevaluating Agricultural Productivity Gaps with Longitudinal Microdata," *Journal of the European Economic Association*, 11 2020, *19* (3), 1522–1555.

Hendricks, Lutz and Todd Schoellman, "Human Capital and Development Accounting: New Evidence from Wage Gains at Migration," *The Quarterly Journal of Economics*, 12 2017, *133* (2), 665–700.

Imbert, Clément and John Papp, "Costs and Benefits of rural-urban migration: Evidence from India," *Journal of Development Economics*, 2020, *146*.

International Monetary Fund (IMF), "Policy Responses to COVID-19," 2020. Accessed April 17, 2020. url: https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19.

Josephson, A., T. Kilic, and J.D. Michler, "Socioeconomic impacts of COVID-19 in low-income countries," *Nature Human Behavior*, 2021, *5* (1), 557–565.

Kerwin, Donald, Mike Nicholson, Daniela Alulema, and Robert Warren, "US Foreign-Born Essential Workers by Status and State, and the Global Pandemic," Technical Report, Center for Migration Studies 2020.

Lagakos, David, Samuel Marshall, Ahmed Mushfiq Mobarak, Corey Vernot, and Michael E. Waugh, "Migration costs and observational returns to migration in the developing world," *Journal of Monetary Economics*, 2020, *113*, 138–154.

McGovern, Mark E, Aditi Krishna, Victor M Aguayo, and SV Subramanian, "A review of the evidence linking child stunting to economic outcomes," *International Journal of Epidemiology*, 2017, *46* (4), 1171–1191.

McKenzie, David, Steven Stillman, and John Gibson, "How Important is Selection? Experimental vs. Non-Experimental Measures of the Income Gains from Migration," *Journal of the European Economic Association*, 2010, *8* (4), 913–945.

Mobarak, Ahmed Mushfiq and Corey Vernot, "Credit to address seasonal poverty when migration income is lumpy," AEA RCT Registry ID AEARCTR-0005866 2020.

Morten, Melanie, "Temporary Migration and Endogenous Risk Sharing in Village India," *Journal of Political Economy*, 2019, *127* (1), 1–46.

Nandi, Arindam, Sonia Bhalotra, Anil B Deolalikar, and Ramanan Laxminarayan, "The Human Capital and Productivity Benefits of Early Childhood Nutritional Interventions," in Donald A. P. Bundy, Nilanthi de Silva, Susan Horton, Dean T. Jamison, and George C. Patton, eds., *Child and Adolescent Health and Development*, 3 ed., Washington, DC: International Bank for Reconstruction and Development/World Bank, 2017, chapter 27, pp. 385–402.

OECD/ADBI/ILO, *Labor Migration in Asia: Impacts of the COVID-19 Crisis and the Post-Pandemic Future*, OECD Publishing: Paris/ADBI, Tokyo, 2021.

Roy, Rajesh and Vibhuti Agarwal, "Millions of Indians Are Fleeing Cities, Raising Fears of a Coronavirus 'Land Mine' in Villages," *The Wall Street Journal*, 2020. May 27.

Saltiel, Fernando, "Who Can Work from home in Developing Countries?," *COVID Economics: Vetted and Real-Time Papers*, 2020, *6*, 104–118.

Sanchez, Daniel Garrote, Nicolas Gomez Parra, Caglar Ozden, and Bob Rijkers, "Which Jobs Are Most Vulnerable to COVID-19? What an Analysis of the European Union Reveals," Research and Policy Briefs 34, World Bank Malaysia Hub 2020.

Shrestha, Maheshwor, Ahmed Mushfiq Mobarak, and Iffath Anwar Sharif, "Migration and Remittances: The Impacts of a Government Intermediated International Migration Program," Policy Research Working Paper 9165, World Bank Group 2020. License: Creative Commons Attribution CC BY 3.0 IGO.

United Nations Department of Economic and Social Affairs (UNDESA), "Cross-national comparisons of internal migration: An update on global patterns and trends," Population Division Technical Paper 2013/1 2013.

__ , "International migrant stock 2019," Technical Report 2019.

United Nations Population Fund (UNFPA), "Urbanization and Migration in Bangladesh," Technical Report 2016.

Valsecchi, Michele, "Internal migration and the spread of Covid-19," *COVID Economics: Vetted and Real-Time Papers*, 2020, *18*, 170–195.

World Bank, "COVID-19 Crisis Through a Migration Lens," Migration and Development Brief no. 32 2020a.

__ , "Pase II: COVID-19 Crisis Through a Migration Lens," Migration and Development Brief no. 33 2020b.

__ , "World Development Indicators," Technical Report 2020c. Accessed June 15, 2020.

List of Tables and Figures

Tables

Figures

Table 1: Primary Data Sources

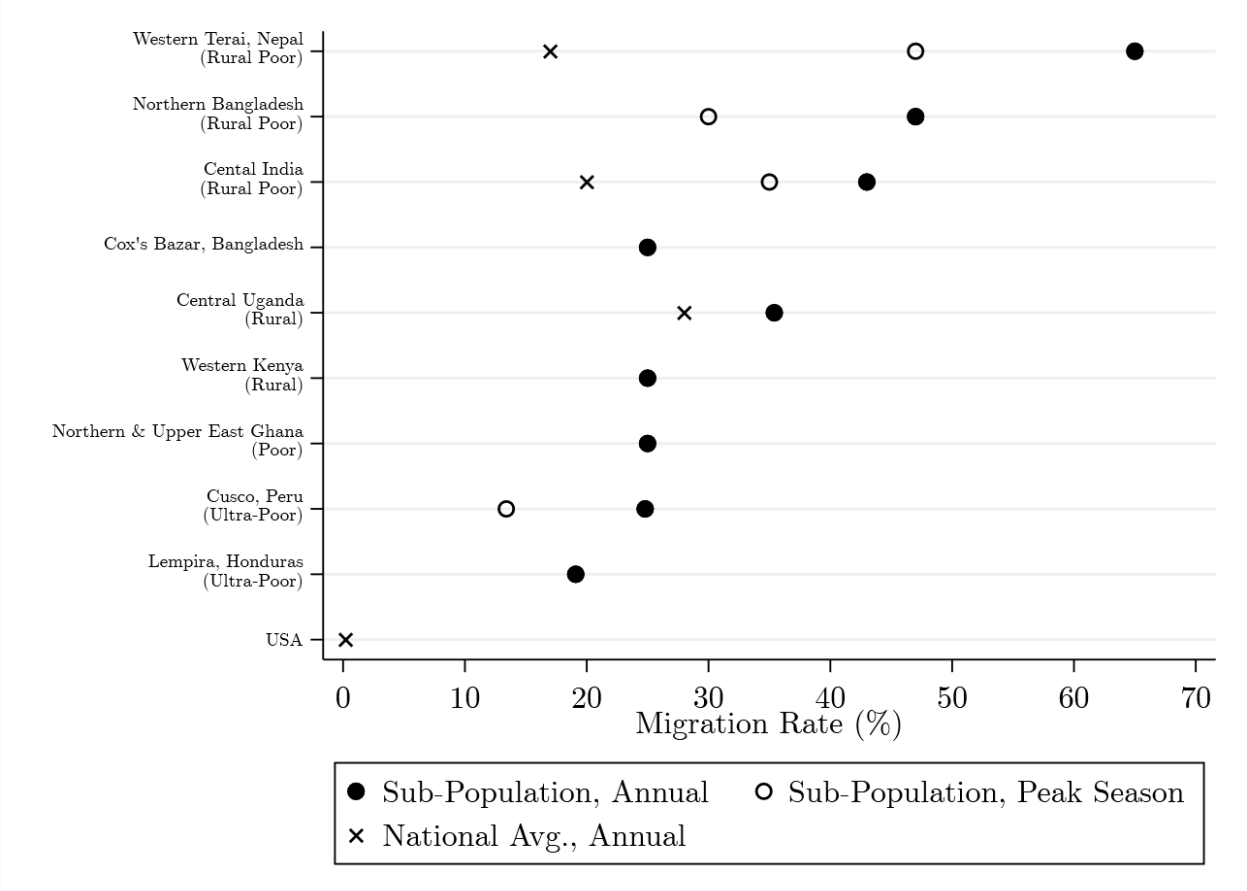
Sample	Description	Identification	Original Survey Design	Outcome Variables
G2G (2,896 HHs)	Bangladeshi participants in a 2013 visa lottery for work permits in Malaysia	Randomized variation in propensity to migrate induced by visa lottery in pre- and post-COVID periods	In-person surveys of 3,512 households in Aug-Dec 2018 representing both lottery winners and losers	Income: monthly income from Spring 2019 and April 2020 Health: reported symptoms in April 2020 Isolation: reports of social exclusion
NPL (1,419 HHs)	Households in bottom 50 percentile of wealth in rural parts of Western Terai, Nepal	Diff-in-diff pre- and post-COVID between households that do and do not report remittance income as the primary source of earnings in 2019, with a long panel of pre-periods to verify parallel trends	6 rounds of phone surveys between Aug 2019 and July 2020 with 1,820 rural households	Income: labor earnings from October 2019 and April 2020 Food security: 6 months of 2019/2020 and every month of prior year
NLS (294 HHs)	Landless agricultural households in Northern Bangladesh eligible for short-term migration loan	Diff-in-diff pre- and post-COVID between households with and without a member away in 2016–2019, with a long panel of pre-periods to verify parallel trends	In-person surveys of 4,324 households in March and June 2019	Food Security: 4 months of 2020 and every month of 2018/2019 Health: reported symptoms in May 2020
URB (2,682 Wrkrs)	Urban laborers at over 200 spot markets for day labor, primarily in construction, in nine cities in Bangladesh	Descriptive facts about transportation and urban labor conditions prior to and during COVID-19	In-person enumeration of 19,396 workers in September 2018 and followup phone survey with 8,490 respondents in April 2019	Income: monthly labor earnings December 2018–April 2019 Return migration: prevalence of return migration by urban migrants in March–May 2020

Table 2: Predictors of Earnings Decline in URB Sample

Outcome: Change in Household Earnings from April 2019 to April 2020						
COVID-19 rate as of June 1 2020 in worker's district of:						
Residence	-11.91	40.67***	19.61*	6.872	-11.46	45.93***
(June 2020)	(7.963)	(10.66)	(8.795)	(8.527)	(8.056)	(10.63)
Labor Market		-69.03***				-43.70***
(March 2020)		(9.001)				(10.06)
Labor Market			-60.40***			-49.33***
(April 2019)			(7.139)			(10.39)
Labor Market				-44.11***		4.734
(Sept 2018)				(7.029)		(9.964)
Residence					-5.788	-8.541
(Native)					(25.23)	(25.65)
Constant	-324.6***	-309.1***	-295.9***	-297.3***	-324.2***	-293.9***
	(4.644)	(5.005)	(5.541)	(6.150)	(4.992)	(6.482)
R-squared	0.001	0.0231	0.0279	0.0157	0.001	0.0357
Observations	2,602	2,598	2,601	2,602	2,602	2,597

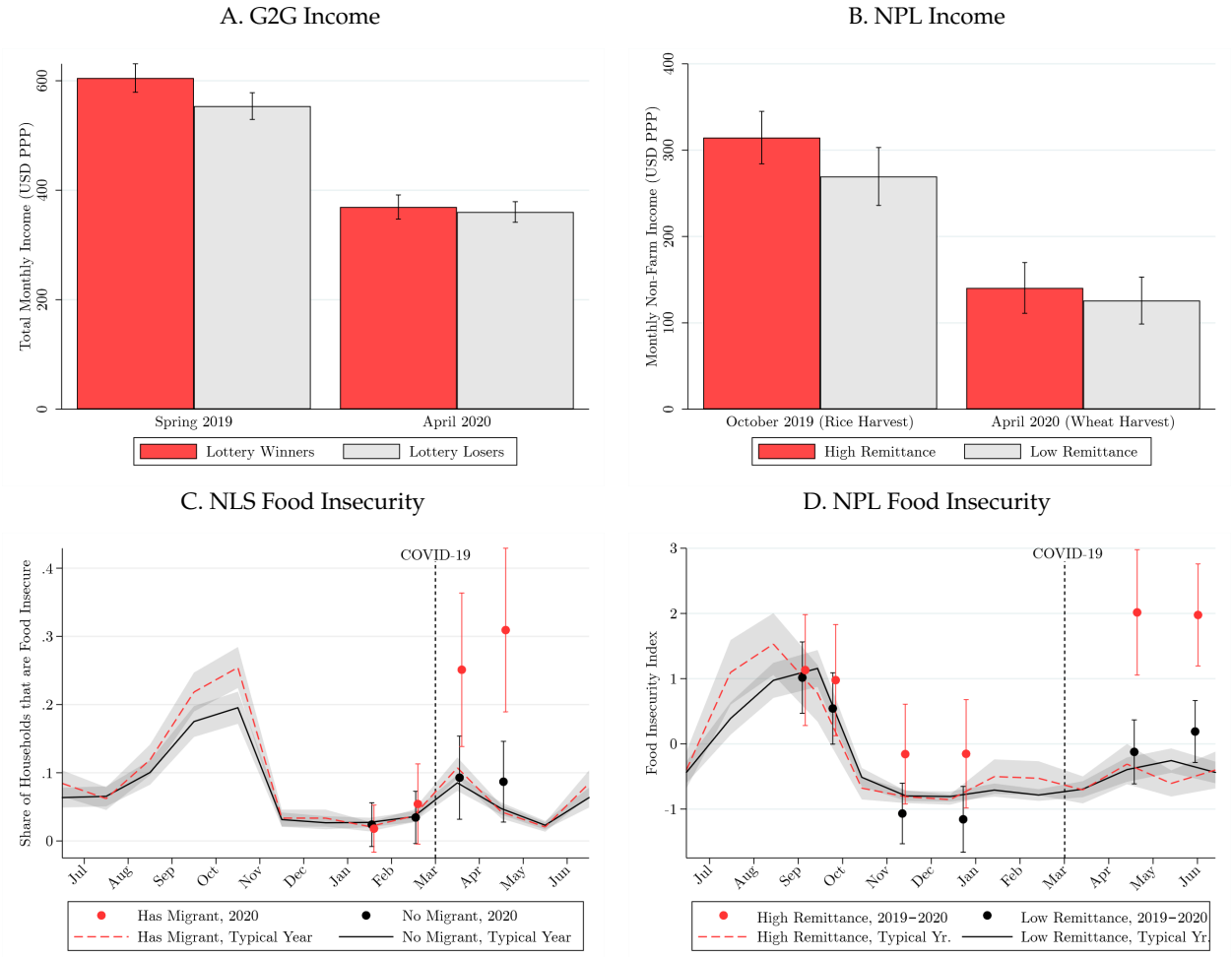
Notes: Decline in worker earnings as a function of COVID-19 rates by history of residence. Robust standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1: Short-Term Migration Rates in Multiple Populations



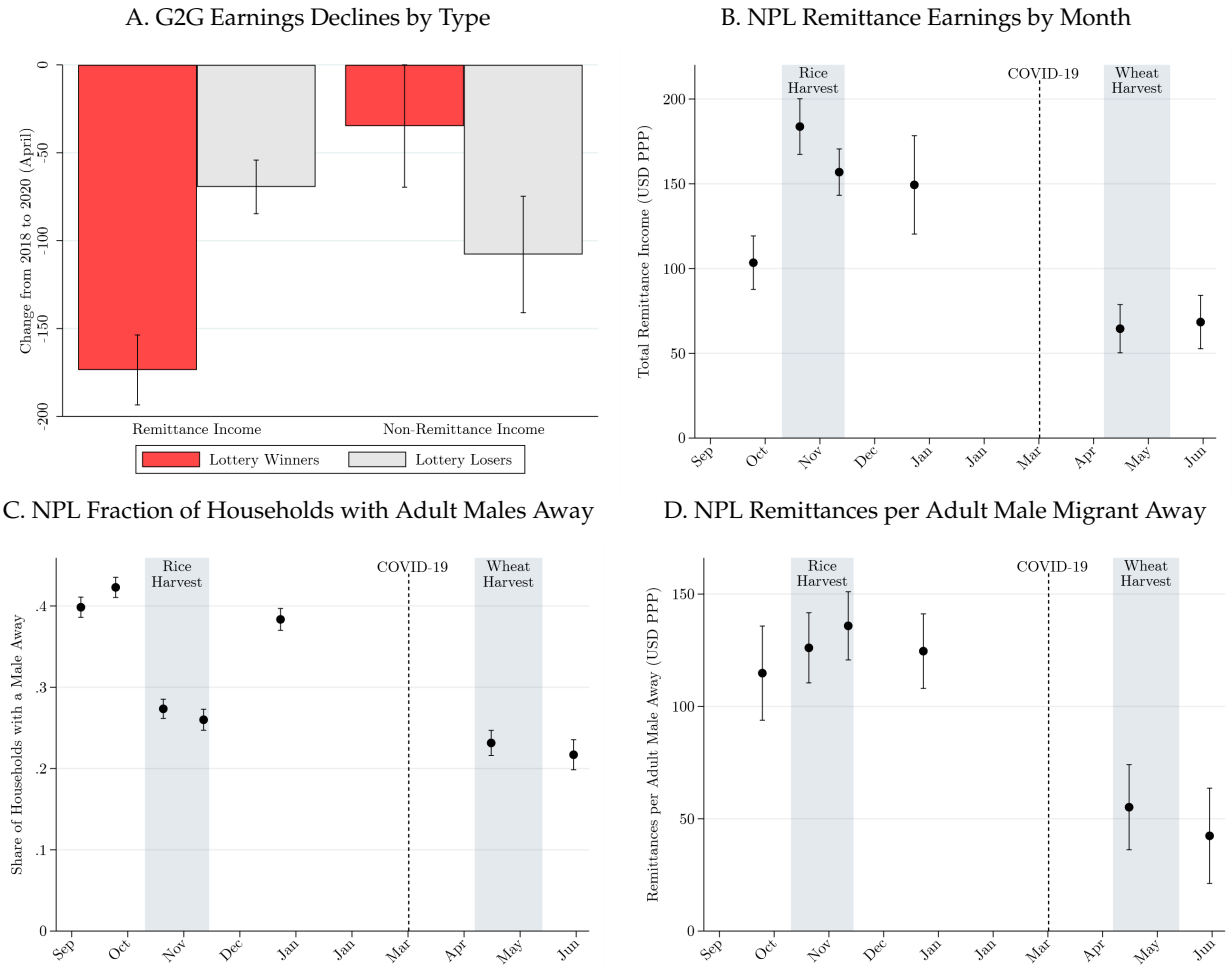
Notes: Fraction of households with a departing migrant who returns in under 12 months. See Table S1 for details on all data sources.

Figure 2: Impact of COVID Crises by Migrant-Sending Status



Notes: Means and 95% confidence intervals. A. G2G Income is monthly earnings from wages, business, remittances, capital, NGOs, friends and family, and home production. B. NPL Income is the sum of earnings form wages and remittances. High Remittance indicates households that listed remittances as their primary source of income in 2019. C. NLS Food Insecurity is the fraction of households that restricted the number or size of meals for more than half the month. Has Migrant indicates households that had at least one temporary migrant in 2016–2019. Typical Year reflects data on monthly food insecurity from January 2018 through May 2019 collected in two survey rounds in February and June 2019. D. NPL Food Insecurity is a standardized index of two questions administered in six survey rounds in 2019 and 2020. Typical Yr. reflects respondents' recollection about a prior "typical year" reported during the April–May 2020 phone survey round.

Figure 3: Decline in Remittance Earnings



Notes: Means and 95% confidence intervals. A. G2G changes in household income from April 2018 to April 2020 by source. B. NPL remittance income by month. C. NPL fraction of households with an adult away by month. D. NPL remittance earnings per adult male away by month. For Panels B–D, data from the the 2019 April wheat harvest is unavailable.

Acknowledgements and Disclosure Statement

We are indebted to the study participants for generously giving their time. We are grateful to Mehrab Ali, Vibhuti Bhatt, Ashraful Haque, Alamgir Kabir, Rifaiyat Mahbub, Ashraf Mian, Shabib Raihan, Rubait Rahman, and Sneha Subramanian in Bangladesh and to Priyankar Chand and Arjun Kharel in Nepal for local research support.

The data collection and the research were funded by grants from the Bill and Melinda Gates Foundation, Evidence Action, Givewell.org, Global Innovation Fund, International Growth Centre, IZA (GLM-LIC program), Mastercard Center for Inclusive Growth, UK Department for International Development, World Bank Group, UNU-WIDER, and Yale Research Initiative on Innovation and Scale. We thank, without implicating, participants at webinars organized by UNU-WIDER, World Bank DECRG Poverty Group, Inter-American Development Bank (COVID-19 and labor markets), World Bank Migration e-seminar, Universidad de San Andres, CERDI/Paris School of Economics seminar on Economics of Migration, the Bangladesh National Data Analytics Task Force, UNDP-Bangladesh, a2i - Ministry of Information and Communication Technology in Bangladesh, World Bank - Social Protection and Jobs - Africa Region, Innovations for Poverty Action and BRAC for useful suggestions. This study was originally published under the UNU-WIDER project Transforming Informal Work and Livelihoods.

All data collection was approved by the Yale University IRB.

The order of author names is alphabetical as all authors contributed to data collection, analysis, and writing. Naguib and Reimão were employed by Evidence Action, the implementing partner for the No Lean Season experiment, from 2016 to 2019. Mitchell's position at Y-RISE from 2019–2021 wass also funded by Evidence Action. No institution had the right to review results before publication. The remaining authors declare we have no conflicts of interest.

Supplementary Appendix for "Migration and the Labor Market Impacts of COVID-19" For Online Publication Only

A Data

A.1 Study Samples

The analysis in this paper primarily uses four COVID-19 specific phone surveys that sample from participants in existing studies and took place in April–June, 2020.

Government-to-Government (G2G): The G2G sample, conducted in Bangladesh, consists of individuals who applied for a visa lottery in 2013, intermediated by the Government of Bangladesh, for a temporary work program in the palm sector in Malaysia. The Government of Bangladesh determined via lottery (conducted independently by the Bangladesh University of Engineering and Technology) which 30,000 individuals would receive work visas of the 1.43 million who applied. This study aims to understand the impact on households of winning the work visa lottery, and more generally, to estimate the returns to short-term international migration. Details of the evaluation are discussed by Shrestha et al. (2020).

In 2018 the project tracked and administered surveys to lottery applicant households, including both lottery winners and losers, in 49 subdistricts in the two largest divisions of Bangladesh—Chittagong and Dhaka—via an in-person survey. The population is representative of lottery applicant households in Dhaka and Chittagong Divisions; in practice this sample should roughly be thought of as middle-class Bangladeshis since the poorest households in the country are unlikely to be able to afford the expenses needed to travel abroad.

For our COVID-19-specific phone survey we attempted to contact 3,512 study participants, stratified by lottery outcome, out of which 2,896 consented to participate.

Western Terai, Nepal (NPL): NPL data comes from an existing phone panel of 1,820 rural households in the districts of Kailali and Kanchanpur, two of the poorer districts in the country. This sample was constructed in June, 2019, by randomly selecting 30 wards from 17 of 20 subdistricts, and then selecting a random 90 villages from within those wards. The households surveyed come from the bottom half of the wealth distribution in these villages as estimated by a participatory wealth ranking exercise with members of the village. A substantial fraction of income for these households comes from remittances from migrants in India or elsewhere in Nepal. Initial baseline data were collected in-person in July 2019, and five rounds of phone survey data were collected between August 2019 and January 2020. Details of the planned evaluation are documented by Mobarak and Vernot (2020).

Our COVID-19 specific phone survey constituted the most recent round of the ongoing panel with all 1,820 study participants, out of which 1,419 were reached and consented to participate.

No Lean Season (NLS): The NLS study consists of several rounds of data collection in Northern Bangladesh from

2008 to 2019. The study is a randomized evaluation of a short-term zero-interest migration loan offered during the agricultural lean season to landless agricultural households. The first two rounds of study, from which we report estimates of the causal return to migration, included 1,900 households in 2008 and 3,600 in 2014. Full details from these studies are discussed by Bryan et al. (2014) and Akram et al. (2017), respectively.

In 2017 and 2018, the loan program was expanded to a large scale with 158,014 loans made in 2017 and 143,721 in 2018. For evaluation, the project surveyed a subset of 4,428 eligible households in May 2018 and 4,324 households in June 2019. Details of the evaluation at scale are discussed by Bryan et al. (2019).

For our COVID-19 specific phone survey we attempted to contact 388 study participants from the 2019 round of evaluation, stratified by prior migration experience, out of which 294 consented to participate.

Urban Labor Markets (URB): The URB sample was initially drawn in conjunction with the No Lean Season study. Survey sites were selected to represent all spot labor markets for manual construction labor in the nine most common destination cities for migrants in the NLS study area. At each site, a census of workers was conducted on a random day in September 2018, shortly before the migration season. This census generated a sampling frame of 19,396 workers at 200 spot labor markets in 9 Bangladeshi cities. We then conducted follow-up phone surveys with 8,490 of these workers in April 2019 to track their labor market progress over the 2018–2019 migration season.

For our COVID-19 specific phone survey, we attempted to contact 3,746 of the workers from the April 2019 endline, out of which 2,682 consented to participate. We reached out by phone to an additional 1,930 workers from the initial census who were not surveyed in April 2019, but this group had a response rate below 20% and are excluded from study. All results are robust to including respondents from this subsample.

Data on Migration Rates: The national migration rates in Figure 1 are calculated using nationally representative datasets. Data for Nepal come from the 2010–2011 round of the Nepal Living Standards Survey (NLSS). Ugandan data come from the 2009 and 2011 waves of the Uganda National Panel Survey (UNPS). Migration rates in the United States are computed from the 1996, 2001, 2004, and 2008 rounds of the Survey of Income and Program Participation (SIPP). Remaining values were reported in the sources cited, detailed in Appendix Table S1.

[Table S1 about here.]

A.2 Survey Attrition

Appendix Table S2 compares respondents from our COVID-19 phone surveys to the population from which they are sampled. The first three rows report average household size, education of the household head, and monthly income prior to COVID-19. In all cases, phone survey samples match the larger sampling frame. The next two rows report survey response rates by migration status. Nonresponse to the phone survey is nearly exactly balanced between migrants and non-migrants in all four surveys. Although we cannot rule out selective attrition based household outcomes during the pandemic period, these results indicate that any bias caused by attrition is likely to be small.

[Table S2 about here.]

A.3 Available Data

The four survey samples in this study were part of unrelated research prior to the onset of the pandemic. As a result, not all outcomes are available for all samples. Appendix Table S3 provides a detailed description of each variable that is observed in each sample and when it was collected. Some pre-pandemic outcomes were reported retrospectively during the post-pandemic phone survey while others were recorded during contemporaneous pre-pandemic surveys. Where possible, we verify that results are consistent between pre- and post-pandemic recall data.

[Table S3 about here.]

B Mobility Restrictions in Bangladesh and Nepal

Migrant populations warrant focus during this pandemic because they face heightened risk from both the direct impacts of the disease and the policy response. Multiple studies document how migrant-heavy sectors in OECD countries, such as transportation and hospitality, experienced the largest contractions at the onset of the pandemic (Garrote Sanchez et al., 2020; Fasani and Mazza, 2020; Gelatt, 2020; Kerwin et al., 2020; Borjas and Cassidy, 2020). Moreover, explicit mobility restrictions such as border closures and visa restrictions feature prominently in public health policy around the world. In this paper we evaluate how the diminished prospects for migration employment and income have affected household wellbeing.

Further economic exposure stems from mobility restrictions that featured prominently in initial public health policy. To limit personal contact, nearly every country in the world incorporated social distancing into its COVID-19 response. Measures included restrictions on gatherings, stay-at-home orders, and mandatory curfews. Importantly, most nations have adopted restrictions on domestic and international travel to slow the geographic diffusion of the illness. In a March 26 audit of 1,596 national border crossings, the IOM (2020a) recorded that 1,372 crossings had imposed limitations on mobility. By April 17, 161 of 190 countries evaluated had instituted barriers to internal mobility in their pandemic response (IMF, 2020).

Barriers to mobility were prominent in social distancing efforts in our study areas of Bangladesh and Nepal. As of May 16 and 28, respectively, both countries had implemented a variety of measures including curtailing public transport, barring non-essential travel, and limiting internal movement. Additionally, Bangladesh banned international arrivals from some regions while Nepal imposed a complete border closure (Hale et al., 2020). Appendix Table S4 describes mobility restrictions in these countries more thoroughly.

[Table S4 about here.]

C Regression Results

Tables S5–S8 present regression results on the differential effect of COVID-19 on household earnings and food security by prior migration dependence in the G2G, NPL, NLS, and URB samples, respectively. These regressions correspond to the results presented in the text and figures in Section 4.

[Table S5 about here.]

[Table S6 about here.]

[Table S7 about here.]

[Table S8 about here.]

Table S1: Secondary Data Sources

Function	Data Source	Population	Sample
Descriptive statistics on national migration rates	(NLSS) Nepal Living Standards Survey	Nepal	5,988
	(UNPS) Uganda National Panel Survey	Uganda	1,237
	(SIPP) Survey of Income and Program Participation	United States	237,711
	Morten (2019)	Rural India	440
Descriptive statistics on migration rates in specific sub-populations	Banerjee et al. (2015)	Ultrapoor in Lempiras, Honduras	654
		Ultrapoor in Cusco, Peru	669
	Barker et al. (2020)	Rural Northern & Upper East Ghana	2,975
	Baseler (2020)	Rural Western Kenya	485
	Imbert and Papp (2020)	Rural poor in India	2,224
Descriptive statistics on migration rates during a peak migration period	Banerjee et al. (2015)	Ultrapoor in Cusco, Peru	669
	Imbert and Papp (2020)	Rural poor in India	2,224

Table S2: Summary Statistics for Original Sample and COVID Phone Subsample by Study

	G2G		NPL		NLS		URB	
	COVID	Original	COVID	Original	COVID	Original	COVID	Original
Observations	2,896	3,512	1,419	1,820	294	4,324	2,682	8,490
HH Size	4.88	4.88	5.03	5.03	4.81	4.74		
HH Head Secondary Educ.	0.24	0.24	0.31	0.29	0.1	0.05		
Pre-COVID Income (USD PPP/Month)	562	561	181	186	237	219	359.3	343
Migrant Response Rate	0.82		0.79		0.76		0.72	
Non-Migrant Response Rate	0.83		0.79		0.76		0.73	

Table S3: Available Data on Pre-COVID Outcomes by Sample

Sample	Outcome	Outcome Date	Survey Date	Details
G2G	Household Earnings	Spring 2019	April 2020	
		April 2018	August 2018	Broken down by source
NPL	Household Earnings	September 2020 to January 2021	September 2020 to January 2021	Broken down by source
	Food Security	Typical Year	May 2020	Index of 3 questions; Recall over 12 months
		September 2020 to January 2021	September 2020 to January 2021	Index of 3 questions
	Members Away	September 2020 to January 2021	September 2020 to January 2021	
NLS	Food Security	March 2018 to June 2019	March 2019 and June 2019	Recall over 12 months
		January 2020 to February 2020	May 2020	
URB	Individual Earnings	October 2018 to January 2019	April 2019	Recall over 4 months
		March 2020	May 2020	Pre-pandemic earnings
	Native Place	Birth	September 2018	
	Employed Subdistrict	September 2018	September 2018	
		April 2019	April 2019	
		March 2020	May 2020	Pre-pandemic location

Table S4: COVID-19 Government Mobility Policies in Bangladesh and Nepal

	Bangladesh as of May 16	Nepal as of May 28
School Closing	All schools closed	All schools closed
Work place closing	Closing/work from home, some sectors	Closing/work from home, some sectors
Cancel public events	Required cancelling	Required cancelling
Restrictions on gatherings	Restrictions on gatherings of 10 people or less	Restrictions on gatherings of 10 people or less
Close public transport	Require closing (or prohibit most citizens from using it)	Require closing (or prohibit most citizens from using it)
Stay home requirements	Require not leaving house with exceptions for daily exercise, grocery shopping,and 'essential' trips	Require not leaving house with exceptions for daily exercise, grocery shopping,and 'essential' trips
Domestic travel restrictions	Internal movement restrictions in place	Internal movement restrictions in place
Foreign travel restrictions	Ban arrivals from some regions	Ban on all regions or total border closure

Source: (Hale et al., 2020)

Table S5: Differential Impact of COVID-19 by Migration Dependence in G2G Sample

Outcome:	April 2020 HH Earnings			
Pre-Period:	April 2019 (Post-COVID Recall)		April 2018 (Pre-COVID Survey)	
Migrant × post	-41.0	-41.0	-29.1	-14.7
	(16.1)	(16.1)	(24.2)	(25.8)
Post	-183.5	-183.1	-180.6	-190.2
	(10.8)	(10.8)	(17.2)	(18.2)
Migrant	50		53.6	
	(18.1)		(20.4)	
Constant	539.3		521.8	
	(12.4)		(15.4)	
HH FEs		X		X
N	3,876	3,876	4,320	4,320
R-squared	0.08	0.26	0.05	0.11

Notes: Migration dependence defined by visa lottery status. Standard errors clustered by Union in parentheses.

Table S6: Differential Impact of COVID-19 by Migration Dependence in NPL Sample

Outcome:	HH Monthly Earnings		HH Monthly Food Insecurity	
Pre-Period:	Sep–Dec 2019 (Pre-COVID Survey)		Typical Year (Post-COVID Recall)	
Migrant × post	-23.0	-13.2	0.60	0.60
	(30.3)	(33.1)	(0.21)	(0.21)
Post	-162.3	-171.0		
	(18.3)	(19.3)		
Migrant	13.0		0.25	
	(25.0)		(0.16)	
Constant	312.7			
	(15.4)			
HH FEs		X		X
Month FEs			X	X
N	6,534	6,534	7,707	7,707
R-squared	0.03	0.03	0.06	0.06

Notes: Migration dependence defined by self-reported dependence on remittance income. Food insecurity is an index of three questions on household food availability. Standard errors clustered by household in parentheses.

Table S7: Differential Impact of COVID-19 by Migration Dependence in NLS Sample

Outcome:	HH Food Insecurity			
Pre-Period:	2017–2019 (Pre-COVID Survey)		Jan–Feb 2020 (Post-COVID Recall)	
Migrant × post	0.089	0.096	0.183	0.183
	(0.034)	(0.040)	(0.062)	(0.072)
Migrant	0.010		0.007	
	(0.005)		(0.005)	
HH FEs		X		X
Month FEs	X	X	X	X
N	32,731	32,731	584	584
R-squared	0.06	0.22	0.10	0.50

Notes: Migration dependence defined by migration history over prior three years. Food security defined by missing meals or reducing portions for Standard errors clustered by household in parentheses.

Table S8: Differential Impact of COVID-19 by Migration Dependence in URB Sample

Outcome:	May 2020 Worker Earnings			
Pre-Period:	May 2019 (Post-COVID Recall)		Dec 2018–Mar 2019 (Pre-COVID Survey)	
Migrant × post	-42.8	-42.8	-51.8	-47.6
	(16.1)	(16.1)	(13.6)	(17.1)
Post	-285.7	-285.7	-212.8	-222.3
	(15.6)	(15.6)	(13.2)	(16.7)
Migrant	29.5		17.2	
	(17.1)		(2.7)	
Constant	391.5		325.1	
	(16.7)		(1.7)	
Worker FEs		X		X
N	5,285	5,285	35,102	35,102
R-squared	0.53	0.53	0.20	0.20

Notes: Migration dependence defined by self-reported native place different from place of work. Standard errors clustered by worker in parentheses.