Covid-19 Vaccination and Economic Recovery in Latin America: Evidence from the 2021 HFPS*

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April 4, 2023

Abstract

During 2021, most Latin American countries successfully deployed vaccines and their labor markets began to recover from the Covid-19 slump. Using two waves of the 2021 High Frequency Phone Survey, we investigate this process, analyzing social disparities and the role of vaccination status on individual labor market outcomes. We first document the highly uneven social impact of the recession. Employment losses were larger for the oldest and youngest workers, women and economically disadvantaged individuals. We also show that these groups experienced significant absolute and relative gains during the second half of 2021, although they remained still far from their pre-pandemic employment. Our analysis also shows large overall increases in the overall vaccination rates during the second half of 2021. However, the vaccination rates for economically disadvantaged individuals were persistently lower, largely because of lack of knowledge on how to obtain the vaccine. Our analysis also indicates that vaccination allowed for a faster return to work, suggesting that lagging vaccination rates may have been an impediment to the full recovery of the employment and earnings of economically disadvantaged individuals.

*This paper was commissioned by the LAC Poverty and Equity unit of the World Bank to analyze the effects of Covid-19 vaccines on the economic recovery using the High Frequency Phone Surveys. We are grateful to Ximena del Carpio, Gabriel Lara, Carolina Mejia-Mantilla and Diana Sanchez-Castro. The usual disclaimer applies.

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1 Introduction

The goal of the paper is to quantify the labor market impact of the Covid-19 pandemic in Latin America and to analyze the role of the vaccine deployment in speeding up the recovery. Our analysis emphasizes the diverging experiences of different socioeconomic groups along these dimensions..

We rely on the two rounds of the High Frequency Phone Survey (HFPS) that took place during 2021. We focus on year 2021, a period with encouraging signs of improving labor markets and rapid vaccine deployment, but also a period during which households earnings remained at pre-pandemic levels and economic inequality might be increasing (WorldBank, 2021).

More specifically, this paper addresses three main questions. What was the impact of the Covid-19 pandemic on employment across countries in Latin America and which socioeconomic groups were more severely affected? Did Covid vaccines reach the whole population at a similar pace or was the progress socially uneven? If any groups lagged behind in terms of vaccination rates, was it due to lack of access or by reluctance to seek immunization? Last, did immunization hep return to work faster?

Next, we summarize our main findings. We show that, in aggregate terms, employment dynamics were similar across most countries in the region: employment rates fell drastically between the onset of the pandemic and the middle of 2021 (by about 10 percentage points). However, the second half of the year witnessed rapid deployment of Covid-19 vaccines and the beginning of a vigorous employment recovery. Between the second and fourth quarters of 2021, the employment rate in Latin America increased by 3 percentage points.

Our analysis of the micro data reveals that the impact of the pandemic on employment was highly uneven across society: the largest employment losses were experienced by youth, mature workers (45-65), females and economically disadvantaged individuals. The only exception to this pattern were immigrants. This group suffered *smaller* Covid-related employment losses, perhaps because they could not afford to retreat from the labor market to protect their health. Our data also shows that, over the course of 2021, the most affected groups experienced large absolute and relative employment gains.

Our analysis of the survey questions related to immunization deliver several interesting findings. We document that over the course of 2021, practically all countries in Latin America (LAC) successfully rolled out vaccination campaigns. We estimate that in the middle of 2021, only 32% of the population in LAC had received at least one

immunization dose but, by the end of the year, the vaccination rate increased to 79%. We also find large differences in vaccination rates across society during the first half of 2021. As expected, the highest vaccination rates were found among older individuals, the group that had been given priority access to the vaccines. However, we also find initially higher vaccination rates among women (by about 2 percentage points relative to otherwise similar men) and *persistently* lower vaccination rates among economically disadvantaged groups (defined by education, assets, formality and nativity). Our analysis strongly suggests that the lagging vaccination rates among individuals with low socio-economic status was largely due to lack of knowledge on how to obtain the vaccine and, only to a lesser extent, greater reluctance to seek immunization.

Last, our estimates also indicate that immunization increased the probability of employment, particularly for females, youth and college-educated individuals. In sum, our findings underscore the role played by the rapid deployment of immunization in permitting a quick recovery in employment and, thus, household earnings.

Our paper is related to the growing literature on the labor-market effects of the Covid-19 pandemic. Adams-Prassl et al. (2020) conducted real-time surveys in the US, UK and Germany as the pandemic was spreading in 2020 and documented cross-country differences in the initial labor-market impact of the pandemic. They also found that the employment of less educated workers and women was more negatively affected, as well as that of workers in occupations that were less amenable to remote operations.Farre et al. (2022) also conducted a household survey in 2020 in Spain, aimed at measuring not only the effects on employment but also on housework, paying particular attention to the intra-household sharing of the increased burden. They found that employment losses were more prevalent among low-skilled workers and college-educated women. More closely related to our study, Berniell et al. (2021) also use the HFPS but focused exclusively on the onset of the pandemic (in 2020). Their main contribution was the construction of occupation-specific measures of the potential for work from home. They also documented larger employment losses for women and for workers in occupations where remote work was less viable. Olivieri et al. (2023) also use the HFPS for year 2021 and 2022 but focus exclusively on Ecuador and how remote schooling affected the labor supply of parents.

Two additional studies focus on the economic impacts of the Covid-19 pandemic on Latin American economies. Lustig et al. (2021) analyze the short and long-run impacts of the pandemic on the four largest Latin American economies. By means of simulations and household survey data for years 2018-2020, they show that the short-

term impact on income inequality and poverty was potentially significant, but could have been mitigated with additional social spending. They also find asymmetric long-run effects on educational outcomes, with disproportionately larger effects on children of low socio-economic status. In turn, Lopez Boo et al. (2022) document the educational learning losses due to preschool program closures in Latin America and the Caribbean, and produce projections of the associated long-run earnings losses. They conclude that the present value of the lifetime earnings losses could amount to 4 percent of GDP.

Relative to these studies, our focus is on the (beginning of the) economic recovery, we use data for the whole region of Latin America and examine labor-market outcomes. During our sample period, most countries in the region successfully deployed large-scale immunization in order to protect their populations and restart their economies. The literature on the economic effects of Covid-19 vaccination efforts is much smaller. One of the few studies in this strand of work is Deb et al. (2022). These authors estimate the high-frequency (short-run) economic effects of Covid-19 vaccination rollouts at the country level and find evidence of a positive effect using emissions and mobility data. In comparison, our analysis uses individual-level data and focuses on the relationship between vaccination status and employment status.

Last, our study is also related to the work studying vaccine hesitancy, which has mostly developed in the fields of public health and nursing studies.[1] Relative to these studies, our paper uses rich survey data covering almost all countries in Latin America and isolates the key socio-economic dimensions behind vaccine hesitancy and information barriers on how to access the Covid-19 vaccine.

The structure of the paper is as follows. Section 2 presents our data. Section 3 describes the employment trajectories in Latin America, both by country and by socio-economic groups. Section 4 describes the evolution of immunization rates by country and by socio-economic groups. Section 5 examines the role of access to the vaccines and reluctance to seek immunization in explaining disparities in vaccination rates across social groups. Section 6 examines the role of vaccination on individual labor market outcomes. Section 7 gathers our main conclusions.

[1] A review of the public health literature can be found in Troiano and Nardi (2021). For a recent contribution in the field of nursing, see Peters (2022).

2 Data: the 2021 HFPS

The 2021 COVID-19 High-Frequency Phone Survey (HFPS) was conducted in two rounds across 24 Latin American countries. The survey was administered to roughly 28,000 households, representing an overall population of almost 400 million people. Data for the first round was collected between May and June, and we shall refer to it as 2021Q2. In turn, the second round of the survey was implemented between October and December (thus, 2021Q4). The surveys were administered to one adult per household, and each respondent was presented with both individual and household-level questions.[2]

Table 1 collects summary statistics on the main variables that will be used in our analysis for the pooled sample. The top panel provides descriptive statistics for the 2021Q2 wave and the bottom panel refers to the 2021Q4 wave. Because our focus is on labor market outcomes, we restrict the sample to individuals age 18 to 65, although we also include individuals age 66-70 in our analysis of vaccination rates and the determinants of the decision to seek vaccination.[3]

Let us begin by examining the labor market variables. As seen in the table, 64% of the respondents were employed in 2021Q2 (top panel). This was substantially lower than one year earlier. Indicator variable *LossEmp* takes a value of one for all individuals who were employed prior to the pandemic, but are out of work at the time of the survey. According to the table, 27% of those employed prior to the pandemic remained out of work as of 2021Q2. The table also reports weekly work hours (37.6 per week on average) and the share of individuals employed in the formal market (42%), conditional on being employed at the time of the survey. Turning now to the bottom panel, it is clear that labor market outcomes improved markedly over the second half of 2021. The share of respondents employed was 67% in 2021Q4, that is, 3 percentage-points higher than in the previous wave of the survey. Reassuringly, the share of individuals who were employed prior to the pandemic and remained out of work at the time of the survey

[2]As shown in Table A.1, pooling all countries, the first round of the survey gave rise to data for 28,602 adult respondents across 24 countries in Latin America. Similarly, round 2 contains observations for 27,736 adult individuals across the 22 LAC countries that participated (Antigua & Barbuda and Brazil did not participate in the second round of the survey). All national samples were based on a dual frame of cell and landline phones, and selected as a one-stage probability sample, with geographic stratification of landline numbers. Survey estimates represent households with a landline or at least one cell phone and individuals of 18 years of age or above who have an active cell phone number or a landline at home. For more details on the methodology, see (Flores Cruz, 2021).

[3]The summary statistics reported in this table are raw means that do not use the survey weights. The remaining tables in the paper do apply survey weights.

also fell by a similar amount. When applying survey weights to our calculations (as done in Table A.3), we observe a similar 4 percentage-point increase in the employment rate between the two surveys, although the levels are somewhat lower – 60% and 64%, respectively, in the two waves.[4]

Table 1 also reports on some demographic characteristics, which remained fairly unchanged between the two waves of the survey, as one would expect. Specifically, based on unweighted means, the average age among respondents was 37 years, 53% were women, around 70% lived in urban areas, the average number of children per household was approximately 1.25, about 35% of respondents had a college degree, and the share of foreign-born was around 3%.[5]

Let us now turn to the more novel data about Covid-19 vaccination. We defined an indicator for having received at least one dose of the vaccine by the time of the survey (Vax). According to this variable, 26% of the respondents had been vaccinated as of 2021Q2 and, remarkably, this value increased to 73% by the end of the year.

Our examination of the reasons behind social disparities in vaccination rates will rely on the following two variables. We constructed an indicator for knowing how to access the vaccine ($VaxKnow$), which was asked of all respondents. As can be seen in the top panel of the table, 56% of respondents knew how to access the vaccine. By the end of the year, the corresponding value had increased to 74%.

We also constructed a dummy variable that takes a value of one for respondents who intended to obtain the vaccine ($VaxPlan$) and zero otherwise. It is worth noting that this question was only asked of individuals who had not yet vaccinated at the time of the survey. As a result, almost 18,000 individuals replied to this question in the first wave of the survey, compared to fewer than 6,000 in the 2021Q4 wave. Perhaps not surprisingly, the share of unvaccinated individuals who intended to get vaccinated fell from 71% to 54% between the two waves of the survey, indicating an increasing degree of self-selection among the pool of unvaccinated individuals.

[4]The data in Table 1 suggest a 1.5-hour increase in weekly work hours and a slight increase (of 1 percentage point) in the share of workers with formal employment. However, both the values and the changes for these variables differ substantially when applying survey weights.

[5]We consider three education levels: at most elementary ($Edu01$), high-school graduates ($Edu2$) and college graduates or above ($Edu3$). It is important to keep in mind that questions about nativity were only included in a 4 countries: Peru, Chile, Colombia and Ecuador. Thus, the $FBorn$ variable is missing for all other countries.

3 The labor-market impact of the Covid-19 pandemic in Latin America

The goal of this section is to describe the employment dynamics triggered by the Covid-19 pandemic in Latin America. We first compare the evolution of employment rates across the countries in the region. Next, pool all countries and define several socio-demographic groups of individuals in order to examine how the pandemic affected each of these groups.

3.1 Employment dynamics by country

Using the HFPS data, we can trace the trajectory of employment in each country in Latin America by considering three points in time: prior to the onset of the Covid-19 pandemic, the second quarter of 2021, and the fourth quarter of 2021. The employment status prior to Covid is based on recall questions (included in both the 2021Q2 and the 2021Q4 surveys), whereas the employment rates for the second and fourth quarters of 2021 are based on employment status at the time of the survey. In all cases, we restrict to the population age 18 to 65.

The resulting employment rates are displayed in Figure 1.[6] The first set of bars describes the employment trajectory for Latin America (LAC) as a whole. Prior to the onset of the pandemic, we estimate that 75% of the population age 18-65 was employed. As anticipated, the pandemic entailed drastic job losses: in 2021Q2, the employment rate was 10 percentage points lower than prior to the onset of the pandemic. However, employment began recovering and, by the end of the year, the employment rate had increased to 68%, a 3 percentage-point increase relative to 2021Q2.

The chart also includes the employment trajectories of all countries in LAC, sorted by the size of the reduction in the employment rate between 2021Q2 and the onset of the pandemic. Specifically, the 5 countries that were hit the hardest were Paraguay, Argentina, Colombia, Ecuador, and Chile, with reductions in employment rates ranging between 14 and 16 percentage points. In addition, these countries also exhibited a partial recovery during the second half of 2021 (of 5-percentage points, on average). In fact, the same pattern is also noticeable for most other countries in the region, as seen in the middle panel of the figure.

[6] As noted earlier, to maintain comparability across the two waves of the survey, we exclude Brazil and Antigua & Barbuda from the analysis because these countries were only surveyed in 2021Q2.

3.2 Employment dynamics by group

Next, we pool all countries in the region and consider partitions of the population by demographic characteristics (age, gender, nativity and urban-rural place of residence) and by socio-economic status (educational attainment and assets).[7] Naturally, some of the previous characteristics (e.g. educational attainment and assets) are likely to be (positively) correlated. However, it is helpful to conduct a preliminary analysis where we simply compare the employment trajectories of each of the groups, without conditioning on other characteristics, to get a sense of the general patterns.

The results are reported in Figure 2. The top left panel compares the employment trajectories for three age groups. The chart clearly shows that the impact of the pandemic on employment rates increased with workers' age. Comparing employment in 2021Q2 with pre-pandemic employment, we find that the reduction in the employment rate was less than 5 percentage points for workers age 18-35, 11 percentage points for workers age 36-44 and over 15 percentage points for workers older than 45. During 2021, the data shows the incipient recovery in employment. Both for your and older workers, we observe the U-shaped pattern observed for the overall population. Interestingly, the employment recovery hadn't yet begun in 2021 for the middle age group (age 36-44), which may have been related to lack of in-person schooling. Support for this interpretation can be found in Olivieri et al. (2023). These authors document that almost all schools in Ecuador operated remotely (if at all) during 2021, but had returned to in-person instruction in 2022, and that parents returned to work more slowly than childless individuals with otherwise similar characteristics.

The top right chart compares the employment trajectories of males and females. Women experienced a much larger reduction in employment rates (13 percentage-points) than men (5 percentage points), but also a quicker rebound during the second half of 2021.

The middle panel of the figure shows that the employment trajectories of urban and rural households were fairly similar. In contrast, we observe different patterns with respect to nativity. Compared to natives, immigrants experienced a smaller reduction in employment rates (6 versus 14 percentage points), suggesting that immigrants could not afford to stay at home to protect their wellbeing. Turning now to the bottom panel, it is striking how the effects of the pandemic on employment were much more pronounced

[7] The HFPS questionnaire provides a list of assets and asks respondents about the *number* of assets they own. Based on this information, we build an indicator variable that takes a value of one for individuals with an above-median count of assets.

among less-educated workers and individuals with few assets. The employment rate for individuals with at most primary education fell by 15 percentage points between the middle of 2021 and the onset of the pandemic, whereas the corresponding drop was only 6 percentage-points among college graduates. Similarly, the employment rate for individuals with below-median assets fell by 5 percentage points *more* than for individuals with more assets. Most likely, this stark contrast between higher and lower socio-economic status individuals reflects the greater feasibility of remote work for college-educated workers and individuals with higher asset levels (Berniell et al. (2021)).

In order to better isolate the role played by each of the dimensions considered above, we proceed to estimate the following simple regression model. For each labor market outcome y and survey wave $t = 1, 2$, we estimate:

$$y_{i,c} = \alpha_c + X_i'\Lambda + \varepsilon_{i,c}, \tag{1}$$

where α_c are country fixed-effects and X_i is a vector of K individual characteristics for individual i (with coefficients vector $\Lambda = (\lambda_1, ..., \lambda_K)$). These characteristics (regarding age, gender, nativity, education, and so on) partition each group by means of dummy variables (leaving one group out along each dimension). To understand the interpretation of coefficients λ_k, it is helpful to consider a single dimension, such as gender. Our models include a female dummy variable (and leave out the male dummy variable). As a result, the coefficient of the female variable can be interpreted as the change in the average value of the outcome among women, relative to men with equal characteristics (age group, educational attainment, nativity, place of residence and number of children) at the same point in time. Our analysis considers three labor market outcomes: Covid-related employment loss (measured in 2021Q2), current employment status and current weekly work hours (conditional on employment).

The results are collected in Table 2. The first main observation is that some characteristics were associated with larger employment losses, measured as the probability of remaining out of work in 2021Q2 (but having been employed at the onset of the pandemic). As seen in column 1, both young (ages 18-35) and more mature workers (age 45-65) suffered larger employment losses than workers in the (omitted) middle age group 36-44. Females, individuals with lower educational attainment and those with below-median assets also experienced larger employment losses. The exception was immigrants who experienced smaller employment losses, likely reflecting the fact that they could not afford to stay at home and protect their wellbeing. It is worth noting that economically

disadvantaged individuals are likely to be low-educated and poor, which means that the effects of both characteristics need to be added to measure the overall impact of Covid-19 on the employment of this group, together with the impacts associated to the other characteristics.

Comparing columns 2 and 3 is useful to compare the employment recovery along each dimension. Generally, the groups that suffered the largest employment losses experienced a larger, albeit only partial, recovery. For instance, in 2021Q2, the employment rate for individuals age 45-65 was almost 10 percentage points lower than the corresponding value for individuals age 36-44 (column 2). By the end of the year, this gap had fallen to 5.8 percentage points (column 3). Similarly, the *ceteris paribus* gap between female and male employment shrunk from 22.7 to 18.3 percentage points during the second half of 2021. The only exception to this pattern are parents. Their employment recovery lagged behind, likely due to the lack of in-person schooling during 2021 in many countries in the region (Olivieri et al. (2023)). Columns 4 and 5 examine the recovery in terms of working hours and a similar pattern emerges.

Summing up, the pandemic hit hardest some demographic groups than others in terms of employment: young workers, mature workers, women and economically disadvantaged individuals. However, over the course of 2021, most countries successfully deployed Covid-19 vaccines and the employment rates began to bounce back. In particular, during the second half of 2021, the hardest hit groups experienced absolute and relative gains in terms of employment.

4 Immunization gaps

As we have shown in the previous section, following the spread of the Covid-19 pandemic during 2020, in the following year most national economies across Latin America began their economic recovery.

There is little doubt that the timing and speed of the recovery was dictated by the rapid deployment of vaccines during 2021. The first goal in this section is to describe the evolution of vaccination rates across LAC countries and across different sociodemographic groups. Not surprisingly, we will document large gaps in vaccination rates across socioeconomic groups, and we will analyze the roles of access to vaccines and reluctance to immunization as explanations for the uneven progress of national immunization efforts. Section 6 will investigate the connection between immunization and employment at the individual level.

4.1 Immunization rates by country

Using the HFPS, and applying the survey weights, we estimate the vaccination rates for each country (and for LAC as a whole) in each of the two survey waves. We define an individual as vaccinated if s/he had received at least one dose at the time of the survey, and restrict the sample to individuals age 18 to 70.

The resulting rates are reported in Table 3. Columns 1 and 2 report national vaccination rates in the first and second waves of the survey, respectively. When pooling the 22 countries surveyed in the two waves (*LAC22*), we find that most countries had already provided at least one dose of the vaccine to the more than 10 of their populations in 2021Q2, with the vaccination rates for Chile Brazil and Uruguay ranged between 74% and 82% and the average across the *LAC22* region reached 32%. Rapid vaccine deployment took place in most countries during the second part of the year and the share of vaccinated increased to 79% in the last quarter of 2021, an 2.5-fold increase. Thus, practically all countries in the region successfully rolled out vaccination campaigns that reached large swaths of the population during the second half of the year, setting up the stage for the much needed return to work.

4.2 Immunization rates by group

Naturally, give the high rates of income inequality in many countries in LAC, immunization rates were unlikely to increase equally across society. A first approximation to measuring these gaps is to examine within-country gaps across groups defined by demographic characteristics and socio-economic status.

The results, reported in Table A.4, clearly illustrate large disparities in vaccination rates in 2021Q2. Purely on demographic grounds, the data show that women in LAC had slightly higher vaccination rates than men (by about 3 percentage points) and older individuals had much larger vaccination rates (by about 38 percentage-points), due to the priority given to immunize the elderly. However, while the female advantage was only noticeable in some countries, the elderly population had uniformly higher vaccination rates in all countries in the region. The second insight that emerges from the table is that economically disadvantaged groups had significantly lower vaccination rates. Specifically, individuals with low education, those with below-median assets, those employed in the informal employment, and immigrants all had systematically lower vaccination rates, both for LAC as a whole and in practically all countries individually.

Clearly, there exist strong correlations across the previous socio-economic character-

istics. For instance, in most countries in LAC, immigrants are typically employed in the informal labor market and more likely to be poor.[8] In order to obtain *ceteris paribus* estimates that better isolate the disparities associated to each socioeconomic characteristic, we follow the strategy used in Section 3.2 and estimate the following model:

$$Vax_{i,c} = \alpha_c + X_i'\Lambda + \varepsilon_{i,c}, \tag{2}$$

where α_c are country fixed-effects and X_i is a vector of K individual characteristics for individual i (with coefficients vector $\Lambda = (\lambda_1, ..., \lambda_K)$). As before, these characteristics partition each group by means of dummy variables. As a result, coefficient λ_k associated to, say, the *Female* dummy can be interpreted as the gap in the vaccination probability for women relative to men with otherwise equal characteristics at the same point in time. We refer to λ_k coefficients as *conditional* vaccination gaps.[9]

Table 4 reports estimates of conditional vaccination gaps, separately by survey wave. As shown at the bottom of the table, the aggregate vaccination rate for LAC increased substantially over the second half of 2021, from about 32% in 2021Q2 to 79% half a year later. However, the increase in immunization was very uneven along socioeconomic lines, as we shall next see.

Let us begin by measuring immunization gaps along purely demographic dimensions. Beginning with age, the first column in the table is informative regarding the gaps in immunization at the beginning of the rollout across age groups (holding constant all other socio-demographic characteristics). Compared to individuals age 36-44, those in the older group (age 45-65) had a vaccination rate 10.5 percentage points higher, whereas those in age group 18-35 had much lower vaccination rates (by 26 percentage points). This pattern simply reflects the priority given in all countries to vaccinating older individuals. Column 2 shows a similar age pattern in vaccination rates. However, the gaps are now much smaller in size due to the gradual reduction in the age threshold required to qualify for immunization. It is also interesting to note that women had slightly higher vaccination rates than men, by about 2 percentage points, in both waves of the survey. However, the number of children in the household was associated with significantly lower vaccination rates. The data estimates in column 1 also show higher

[8] In contrast, their education levels may be above or below the average in the host country. For instance, Olivieri et al. (2021) document that Venezuelan immigrants in Ecuador are much more highly educated than the average native.

[9] We estimate the model on the sample of individuals age 18-65 because our interest in immunization gaps is motivated by the potential implications in terms of employment and earnings.

initial vaccination rates in urban areas (by more than 4 percentage points), but these differences fell by half by the end of the year, as vaccines were deployed in rural areas.

The estimates for all other characteristics point to persistently lower vaccination rates for economically disadvantaged groups (defined by assets, education, formality and nativity). More specifically, individuals with above-median assets had higher vaccination rates in the two survey waves (by 3 and 2 percentage points, respectively), than otherwise similar individuals. Likewise, the vaccination rates of college-educated individuals were also substantially higher in both waves than for individuals with lower educational attainment (by 9 and 5 percentage points, respectively). Similarly, individuals employed in the formal sector, which is typically associated with higher earnings, also had persistently higher vaccination rates. Lastly, the estimates also show that foreign-born status was associated with much lower vaccination rates, beyond the effects due to other characteristics. In contrast to the pattern observed for the other characteristics, the immigrant penalty appeared to increase across the two waves (from 5 to 12 percentage points).

Summing up, our main finding in this section is the the persistently low vaccination rates for economically disadvantaged groups. Next, we turn to analyze what might be the reasons for this disparities.

5 Accessibility and reluctance to immunization

The results in the previous section clearly illustrate unequal immunization rates across social groups in LAC, typically with lower SES individuals having lower rates. In particular, individuals lacking college education, immigrants, workers employed in the informal sector and individuals with fewer assets had lower vaccination rates.

But was this because they were less interested in receiving the vaccination or because they had less access to it? The answer to this question has important policy implications for future epidemics. If the former then increased information or monetary incentives targeted to this group might have helped overcome the hesitancy. On the contrary if the problem was access then the logistics of the immunization campaigns should be adapted.

5.1 Access to vaccines

We begin by analyzing the role of individual characteristics in determining access to Covid-19 immunization. The analysis is based on the HFPS question asking survey

respondents if they *know how to obtain the Covid-19 vaccine*. As expected, among those that had already received at least one immunization dose, the vast majority answered affirmatively (89%). The rate was below 100% because some individuals may have been unsure how they would obtain the second dose of the vaccine. In contrast, only about half of the unvaccinated knew how to obtain the vaccine (54%).

Let us now turn to the estimation of the marginal effects associated with each individual characteristic. We will estimate the model

$$VaxKnow_{i,c} = \alpha_c + X_i'\beta + u_{i,c}, \tag{3}$$

where $KnowVax_{i,c}$ is an indicator taking a value of one if individual i from country c declares that he/she knows how to obtain Covid immunization. As before, vector X_i collects all the individual characteristics α_c is a country-specific intercept and $u_{i,c}$ is a mean-zero error term assumed uncorrelated with the regressors. Importantly, variable $VaxKnow_{i,c}$ is defined for the whole sample, including individuals who have already received one or more vaccine doses. We will also estimate this model separately for survey waves 1 and 2 to examine the evolution of the coefficients between the two periods.

Columns 1 and 2 in Table 5 collect the findings. The estimates reveal two main findings. Let us first consider access gaps by age, gender and place of residence. The coefficients of the age group dummies in column 1 clearly show that access to the vaccines was initially (2021Q2) prioritized for older individuals: those in age group 45-65 were 4.9 percentage-points more likely to know how to obtain the vaccine than otherwise similar individuals in age group 36-44. Likewise, younger individuals (age 18-35) were 13 percentage points less likely than those age 36-44 with equal other characteristics. As seen in column 2, this age gradient vanished in 2021Q4, when the vaccines became accessible to younger individuals. It is also interesting that women were initially better informed on how to access the vaccine (by 5 percentage points in 2021Q2) than observationally similar men, but this gap also vanished by the end of the year. Women were not prioritized over men, but they appeared to have been better informed than men about the logistics of immunization, and probably played an important role in disseminating this information among relatives and friends. In many countries, the logistics of the vaccine rollout also entailed better access initially in urban areas. As can be seen in column 1, urban residents were 5 percentage-points more likely to know how to obtain the vaccine than otherwise similar rural respondents. However, this access gap also vanished in the

second half of 2021.

Next, we turn to access gaps in terms of socio-economic status (SES), defined by asset levels, education, formality and nativity. Our estimates clearly indicate that low-SES individuals had persistently less access to the vaccines. Specifically, even at the end of 2021 (column 2), we find significant access gaps for individuals with below-median assets (5 percentage-points), for individuals with at most primary schooling (18 percentage points lower than college graduates), for individuals employed in the informal sector (almost 6 percentage points), and immigrants (9 percentage points).

In sum, our estimates clearly show that economically disadvantaged groups were much less informed regarding how to obtain the vaccine, which partly explains the immunization gaps documented in the previous section.

5.2 Reluctance to immunization

It has become clear in many countries that not all individuals were equally interested in receiving immunization against Covid-19. Perhaps not surprisingly, some individuals were skeptical about the benefits of immunization or concerned about the potential risks.

To answer this question we will focus on the sample of unvaccinated individuals and make use of the survey question asking unvaccinated individuals if they *intend (plan) to obtain immunization*. More specifically, we will estimate the model

$$VaxPlan_{i,c} = \alpha_c + X_i'\beta + u_{i,c}, \tag{4}$$

where $VaxPlan_{i,c}$ is an indicator taking a value of one if (unvaccinated) individual i from country c plans to obtain Covid immunization. Importantly, this variable is only available for *unvaccinated* individuals. Vector X_i collects all individual characteristics, α_c is a country-specific intercept and $u_{i,c}$ is a mean-zero error term assumed uncorrelated with the regressors. Even though we will estimate this model for both survey waves separately, wave 1 is the most interesting period because it was the onset of the vaccination efforts in most countries in LAC. As before, coefficients vector β will be informative regarding the gap in vaccination rates *conditional* on all other individual characteristics.

The estimates are collected in columns 3 and 4 of Table 5 for survey waves 2021Q2 and 2021Q4, respectively. As shown at the bottom of the table, 83% of the unvaccinated in 2021Q2 were planning to seek immunization, which was a fairly high rate for international standards. However, the value fell to 64% in the second survey wave, as reluctant individuals became relative more prevalent among the unvaccinated population.

Let us now examine the effects of individual characteristics on the intention to obtain immunization. The estimates in column 3 do not uncover significant effects of age, gender, parenthood or place of residence. However, socio-economic status did play an important role. Specifically, intention to obtain the vaccine was positively and significantly related to educational attainment, asset levels and formal employment. The estimates in column 4 are less informative due to the large reduction in sample size arising from the much reduced unvaccinated population by the end of 2021.

In conclusion, our estimates indicate that there was a significantly higher *initial* reluctance to seek immunization among the poor, the less educated, and those employed in the informal sector. However, the rapid and highly successful expansion of vaccination across LAC (as evidenced by the fact that 79% of the adult population had received at least one immunization dose by the end of 2021) reduced the initial reluctance to immunization of economically disadvantaged groups. All in all, the persistently lower vaccination gaps among economically disadvantaged groups documented in Section 4 appear to reflect obstacles to obtaining immunization to a larger extent than persistent reluctance to seek immunization.

6 Vaccination and labor market outcomes

The previous sections revealed persistent gaps in vaccination rates across socio-demographic groups, largely stemming from informational barriers on how to obtain the vaccine. Clearly, unvaccinated individuals faced health risks associated with the higher probability of becoming infected with the Covid-19 virus. The goal of this section is to examine the potential labor-market implications for unvaccinated workers.

A simple way to examine the relationship between vaccination status and labor market outcomes is to estimate the following model. We will consider three labor market outcomes: employment, weekly work hours and the probability of remaining out of work at the time of the survey (for individuals who were employed prior to the onset of the pandemic). For each outcome y for individual i from country c:

$$y_{i,c} = \alpha_c + \beta Vax_i + X_i'\Lambda + \varepsilon_{i,c}, \tag{5}$$

where α_c are country fixed-effects, Vax_i is an indicator for whether the individual has received (at least one dose of the vaccine) and X_i is a vector of individual characteristics (with coefficients vector Λ). Besides controls for gender, number of children, place of

residence, education and nativity, the vector also includes a third-order polynomial in age to capture the life-cycle age profile in labor market outcomes. In addition, these controls also account for the fact that access to vaccines was influenced by socio-demographic characteristics, as documented in the previous sections.

Naturally, it is hard to rule out that unobserved factors could be correlated with vaccination status. Thus, lacking exogenous variation on vaccination status, clean identification of the causal effect on labor market outcomes is probably out of our reach. For instance, individuals working in the healthcare industry may have received Covid-19 vaccines from their employers. In order to mitigate the potential for this type of omitted-variable bias, we will also estimate our models on a sample that excludes individuals employed in the healthcare industry.

The estimates are collected in Table 6. Columns 1-2 present estimates for the first survey wave (2021Q2) for employment and for the probability of remaining out of work at the time of the survey. As seen in column 1, vaccinated individuals appear to have a higher probability of employment (by 3.5 percentage points) than otherwise similar unvaccinated individuals (as of the second quarter of 2021). As expected, the estimates also show much lower employment rates for females (and particularly mothers with several children) and for low-educated workers. Along the same lines, the estimates in column 2 also suggest a smaller probability of remaining out of work for those with at least one immunization dose, although we cannot reject the zero null hypothesis.

Back to the estimated effect on employment, the point estimate in column 4 is much smaller than in column 1, becoming not statistically significant. Thus, the estimates in this table suggest that vaccination delivered an initial advantage in returning to work. As noted earlier, this conclusion may be premature. Individuals employed in the healthcare industry might have been offered immunization (and required to take it) by their employers, introducing a mechanical relationship between vaccination status and employment. In order to examine this possibility, we next exclude healthcare workers from our estimation sample.[10] The estimates are collected in the top panel of Table 7. The point estimate for the vaccination indicator falls in value to 2.2 percentage points and we fail to reject the zero null hypothesis, indicating that the previous estimate in column 1 of Table 6 was affected substantially by workers in the healthcare industry.

The rest of Table 7 conducts heterogeneity analysis on the basis of gender, age and educational attainment for the sample that *excludes* healthcare workers. The estimates

[10]On average health care workers account for about 3% of employment, though it varies by country with richer countries having a higher fraction of workers employed in healthcare.

show that vaccination status had positive and statistically significant effects on the employment of females, youth and college graduates. Women that had received the vaccine were about 4 percentage-points more likely to be employed in the first half of 2021 than otherwise similar women (column 1). The estimates in column 2 confirm that these women were also less likely to remain out of work by a similar magnitude. The estimates in the table suggest that vaccination also provided sizable employment advantages to young workers (around 6 percentage points) and college graduates (4 percentage points).

To further highlight the contrasting estimates for these subgroups of the population, the table also reports the estimates for males, older individuals and those without a college degree. The point estimates for the vaccination indicator are much lower for these groups and never statistically significant at the usual significance levels. Last, the last panel of the table performs a placebo test. Namely, we replace the vaccination indicator for an indicator for *planning* to obtain the vaccine, but not having done so yet. In this case the positive association between vaccination and employment disappears, as we would expect if actually becoming immunized indeed boosted individuals willingness to return to work (or employers willingness to hire them).

It is important to point out that our results are suggestive of a relationship between vaccination status and employment. However, a bullet-proof causal interpretation would require plausibly exogenous variation in vaccination status. Through the inclusion of our control variables, we have mitigated potential omitted variable bias. However, lacking plausibly exogenous variation on vaccination status, our analysis is only suggestive of a causal effect of vaccination on employment, particularly on females, youth and college-educated workers.

7 Conclusions

Using the 2021 HFPS, we have described the process of employment recovery in Latin America and the role played by Covid-19 immunization in fueling the recovery process. Our analysis has produced the following findings.

In aggregate terms, employment dynamics were similar across most countries in the region: the employment rate among adults felt drastically between the onset of the pandemic and the middle of 2021 (by about 10 percentage points). However, the second half of the year witnessed rapid deployment of Covid-19 vaccines and the beginning of a vigorous employment recovery. Between the second and fourth quarters of 2021, the

employment rate in Latin America increased by 3 percentage points.

Our analysis of the micro data revealed that the impact of the pandemic on employment was highly uneven across socioeconomic groups. Namely, the largest employment losses were experienced by youth, mature workers (45-65), females and economically disadvantaged individuals. The only exception to this pattern were immigrants. This group suffered *smaller* Covid-related employment losses, perhaps because they could not afford to retreat from the labor market to protect their health. Our data also shows that, over the course of 2021, the most affected groups experienced large absolute and relative employment gains.

Our analysis of the survey questions related to immunization produced several interesting findings. We document that over the course of 2021, practically all countries in Latin America (LAC) successfully rolled out vaccination campaigns. We estimate that in the middle of 2021, only 32% of the population in LAC had received at least one immunization dose but, by the end of the year, the vaccination rate increased to 79%. We also find large differences in vaccination rates across society during the first half of 2021. As expected, the highest vaccination rates were found for older individuals, the group that had been given priority access to the vaccines. However, we also find initially higher vaccination rates among women (by about 2 percentage points relative to otherwise similar men) and *persistently* lower vaccination rates among economically disadvantaged groups (defined by education, assets, formality and nativity). Our analysis strongly suggests that the lagging vaccination rates among individuals with low socio-economic status was largely due to lack of knowledge on how to obtain the vaccine and, to a lesser extent, greater reluctance to seek immunization.

Last, our estimates also indicate that vaccination status increased the probability of employment and the recovery of household earnings, particularly for females, youth and college-educated individuals. Thus the vigorous rollout of vaccination campaigns across LAC probably accelerated the economic recovery from the large and sudden stop caused by the pandemic between the middle of 2020 and 2021.

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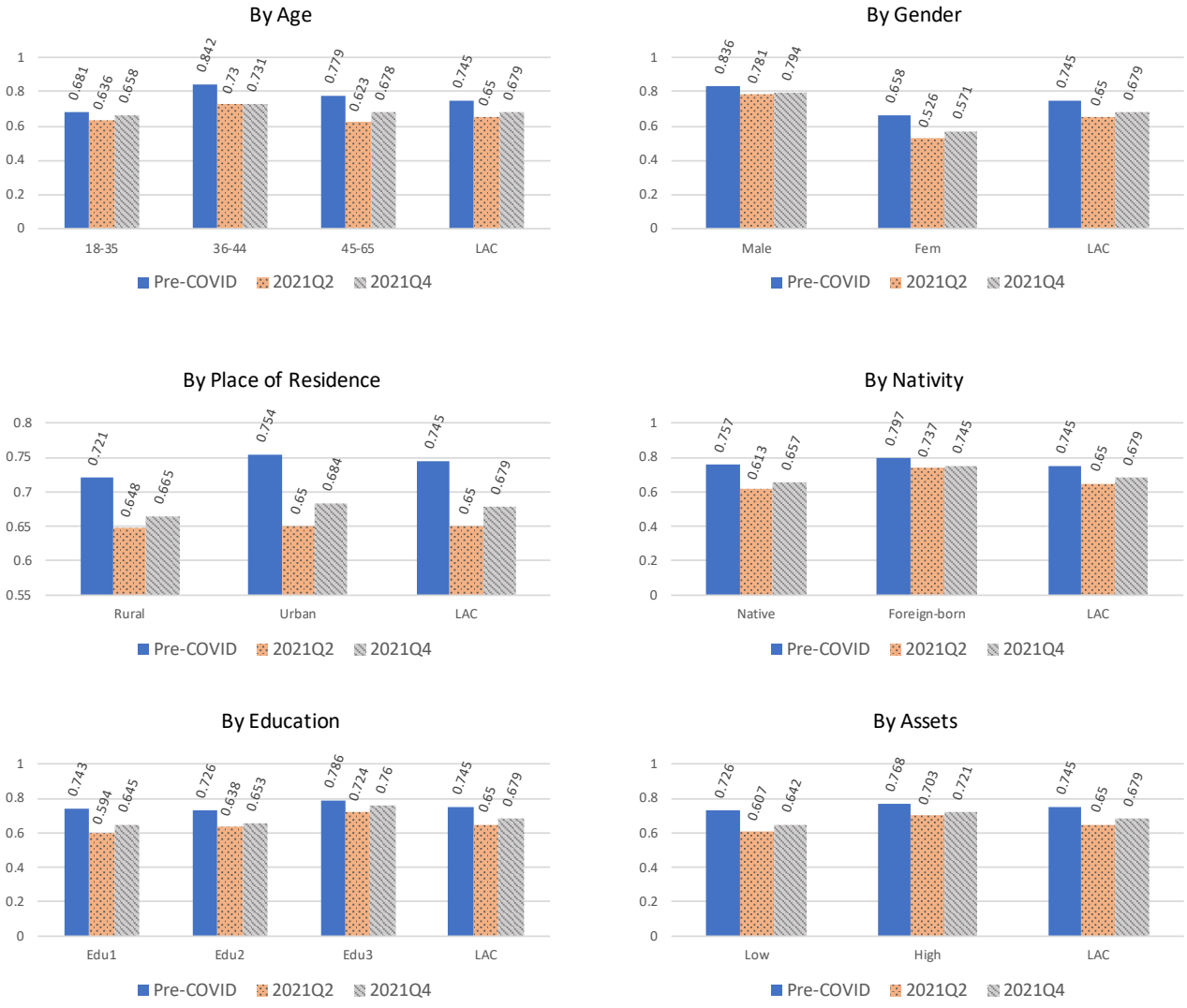
Figure 1: Employment rate by country: before Covid, 2021Q2 and 2021Q4

Notes: Own calculations using the 2021 HFPS. Survey weights used in the calculation of the employment rates. Population age 18-65. LAC excludes Brazil and Antigua to maintain comparability across the two waves of the survey.

Figure 2: Employment rate by group: before Covid, 2021Q2 and 2021Q4



Notes: Own calculations using the 2021 HFPS. Survey weights used in the calculation of the employment rates. Population age 18-65. LAC excludes Brazil and Antigua to maintain comparability across the two waves of the survey.

Table 1: Summary statistics

Variable	(1) Obs	(2) Mean	(3) Std. Dev.	(4) Min	(5) Max
Wave 1: 21Q2					
Employed	24,189	0.64	0.48	0	1
Weekly hours	15,425	37.58	22.02	0	145
Emp. Formal	15,433	0.42	0.49	0	1
LossEmp	17,576	0.27	0.44	0	1
Vax	24,189	0.26	0.44	0	1
VaxKnow	24,189	0.56	0.50	0	1
VaxPlan	17,915	0.71	0.46	0	1
Age	24,189	37.02	12.66	18	65
Female	24,189	0.53	0.50	0	1
Urban	24,189	0.70	0.46	0	1
Num. child.	24,152	1.24	1.29	0	11
Edu01	24,128	0.17	0.37	0	1
Edu2	24,128	0.48	0.50	0	1
Edu3	24,128	0.35	0.48	0	1
FBorn	24,189	0.03	0.16	0	1
Wave 2: 21Q4					
Employed	26,147	0.67	0.47	0	1
Weekly hours	17,516	39.08	20.97	0	140
Emp. Formal	17,573	0.43	0.49	0	1
LossEmp	10,842	0.23	0.42	0	1
Vax	26,147	0.73	0.44	0	1
VaxKnow	26,147	0.74	0.44	0	1
VaxPlan	5,670	0.54	0.50	0	1
Age	26,147	37.51	12.61	18	65
Female	26,147	0.53	0.50	0	1
Urban	26,147	0.67	0.47	0	1
Num. child.	26,140	1.28	1.30	0	10
Edu01	25,971	0.17	0.38	0	1
Edu2	25,971	0.48	0.50	0	1
Edu3	25,971	0.35	0.48	0	1
FBorn	26,147	0.03	0.18	0	1

Notes: Unweighted summary statistics (population age 18-65). HFPS wave 1 data were collected in May/June 2021 and wave 2 in October/December of the same year. *LossEmp* is an indicator taking a value of 1 for individuals employed prior to the pandemic but out of employment at the time of the survey.

Table 2: Conditional gaps labor market

	(1)	(2)	(3)	(4)	(5)
Wave	w1	w1	w2	w1	w2
Dep. Var.	LossEmp	Emp	Emp	Hours	Hours
Age1835	0.064***	-0.111***	-0.086***	-2.390***	-1.155
	[0.015]	[0.014]	[0.019]	[0.846]	[1.135]
Age4565	0.059***	-0.097***	-0.058***	-3.129***	-2.426**
	[0.016]	[0.015]	[0.019]	[0.950]	[1.007]
Edu2	-0.039**	0.034**	0.014	0.473	1.748*
	[0.018]	[0.016]	[0.017]	[0.963]	[0.920]
Edu3	-0.110***	0.116***	0.115***	0.677	2.433**
	[0.020]	[0.018]	[0.020]	[1.067]	[1.087]
Urban	0.017	-0.028**	-0.021	2.447***	4.289***
	[0.015]	[0.013]	[0.015]	[0.771]	[0.920]
FBorn	-0.085**	0.116***	0.071**	8.341***	3.925**
	[0.039]	[0.036]	[0.032]	[2.948]	[1.882]
AssetsHigh	-0.057***	0.051***	0.021	1.913***	0.400
	[0.013]	[0.013]	[0.017]	[0.716]	[0.959]
Female	0.181***	-0.227***	-0.183***	-9.301***	-8.048***
	[0.017]	[0.015]	[0.019]	[0.866]	[1.207]
nChild	-0.003	0.015**	0.016**	0.723**	0.978***
	[0.006]	[0.006]	[0.007]	[0.364]	[0.365]
$Fem \times nChild$	0.016	-0.019**	-0.030***	-1.541***	-1.336**
	[0.010]	[0.009]	[0.010]	[0.495]	[0.550]
Observations	17,509	24,088	25,964	15,361	17,376
Mean DV	0.27	0.65	0.68	37.8	38.6

Notes: Columns 1-3 report data based on the first wave of the survey (21Q2) and columns 4-6 report data based on the second wave (21Q4). *Employment* is an indicator for being employed in the corresponding survey wave. *Hours* is the weekly work hours conditional on employment. *LossEmp* is a dummy variable taking a value of one if an individual is unemployed at the time of the survey but had a job prior to the onset of the Covid-19 pandemic in the country. All models include country fixed-effects. Weighted least-squares using survey weights. Heteroskedasticity-robust standard errors. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Vaccination rates HFPS

Wave	(1) 21Q2 Vax	(2) 21Q4 Vax	(3) 21Q4/21Q2 Vax
Antigua & B.	55.3		
Belice	31.8	85.1	2.7
Guatemala	7.5	69.3	9.2
El Salvador	37.7	82.5	2.2
Honduras	15.7	59.3	3.8
Nicaragua	9.2	49.1	5.4
Costa Rica	35.5	73.5	2.1
Panama	23.5	93.7	4.0
Haiti	1.4	11.1	7.8
Peru	17.1	59.8	3.5
Mexico	37.3	89.2	2.4
Argentina	34.6	92.2	2.7
Chile	81.9	95.9	1.2
Colombia	23.9	60.6	2.5
Bolivia	19.1	76.1	4.0
Guyana	48.5	82.6	1.7
Ecuador	9.1	91.3	10.1
Paraguay	8.0	82.9	10.4
Uruguay	73.7	90.4	1.2
S. Lucia	27.3	51.2	1.9
Dominica	41.0	57.0	1.4
Rep.Dom.	70.5	88.8	1.3
Jamaica	12.6	46.6	3.7
Brazil	80.7		
LAC22	32.1	79.1	2.5
Total	51.0	79.1	1.6

Notes: Means by country and survey wave of the Vax dummy variable, which takes a value of one if the respondent had received at least one immunization dose by the time of the survey. The means were calculated using the survey weights. *LAC22* excludes Brazil and Antigua & Barbuda.

Table 4: Conditional gaps in vaccination rates

	(1)	(2)
Wave	21Q2	21Q4
Dep.Var.	Vax	Vax
Age1835	-0.260***	-0.074***
	[0.011]	[0.015]
Age4565	0.105***	0.028**
	[0.014]	[0.013]
Female	0.018*	0.021*
	[0.010]	[0.011]
nChild	-0.041***	-0.020***
	[0.004]	[0.004]
Urban	0.042***	0.018
	[0.011]	[0.012]
FBorn	-0.050**	-0.120***
	[0.022]	[0.035]
Assets High	0.033***	0.023*
	[0.010]	[0.013]
Edu2	0.002	0.004
	[0.014]	[0.013]
Edu3	0.088***	0.052***
	[0.015]	[0.016]
Emp	-0.070***	-0.029**
	[0.011]	[0.013]
Emp. Formal	0.043***	0.047***
	[0.013]	[0.013]
Observations	25,536	27,497
Mean DepVar	0.32	0.79

Notes: Sample LAC22. Models include country fixed-effects. Formal employment takes a value of zero for non-employed individuals. Assets is an indicator taking a value of one for individuals with high numbers of assets. Because of a change in the phrasing of the question, the indicator takes a value of one for individuals with 3 or more assets in wave 1, and for individuals with 2 or more assets in wave 2. The formal employment dummy takes a value of zero for non-employed individuals and also for those employed informally. Heteroskedasticity-robust standard errors, *** p<0.01, ** p<0.05, * p<0.1

Table 5: Estimates determinants of vaccination access and reluctance to immunization

	(1)	(2)	(3)	(4)
Wave	21Q2	21Q4	21Q2	21Q4
Dep.Var.	VaxKnow	VaxKnow	VaxPlan	VaxPlan
Age1835	-0.130***	-0.004	-0.000	0.035
	[0.013]	[0.014]	[0.012]	[0.049]
Age4565	0.049***	0.011	0.001	-0.043
	[0.013]	[0.015]	[0.015]	[0.049]
Female	0.053***	-0.004	-0.010	0.058
	[0.010]	[0.012]	[0.010]	[0.042]
nChild	-0.037***	-0.006	0.000	0.006
	[0.004]	[0.004]	[0.004]	[0.012]
Urban	0.054***	0.011	0.020	0.038
	[0.013]	[0.014]	[0.012]	[0.038]
FBorn	-0.172***	-0.089**	-0.045	0.077
	[0.035]	[0.036]	[0.060]	[0.069]
Assets High	0.089***	0.050***	0.032***	-0.012
	[0.011]	[0.012]	[0.011]	[0.047]
Edu2	0.074***	0.114***	0.041***	0.107**
	[0.014]	[0.018]	[0.015]	[0.045]
Edu3	0.162***	0.181***	0.043**	0.041
	[0.016]	[0.018]	[0.017]	[0.051]
Emp	-0.021*	-0.013	-0.012	0.050
	[0.012]	[0.015]	[0.011]	[0.047]
Emp. Formal	0.050***	0.057***	0.033**	0.039
	[0.013]	[0.012]	[0.013]	[0.054]
Observations	25,536	27,497	18,215	5,734
Mean DepVar	0.49	0.88	0.83	0.64

Notes: Sample LAC22. Models include country fixed-effects. Formal employment takes a value of zero for non-employed individuals. Assets is an indicator taking a value of one for individuals with high numbers of assets. Because of a change in the phrasing of the question, the indicator takes a value of one for individuals with 3 or more assets in wave 1, and for individuals with 2 or more assets in wave 2. With our definition the share of individuals in LAC22 with high assets in wave 1 is 45.9% and in wave 2 it is 46.0% (both computed using survey weights). Heteroskedasticity-robust standard errors, *** p<0.01, ** p<0.05, * p<0.1

Table 6: Vaccination and labor market outcomes. Full sample

All ind	(1)	(2)	(3)	(4)
Wave	21Q2	21Q2	21Q4	21Q4
Dep. Var.	Employment	LossEmp	Employment	LossEmp
Vax	0.035**	-0.018	0.016	0.031
	[0.015]	[0.016]	[0.020]	[0.025]
Female	-0.227***	0.184***	-0.183***	0.127***
	[0.015]	[0.017]	[0.018]	[0.020]
Nchild	0.007	0.001	0.008	0.002
	[0.006]	[0.006]	[0.007]	[0.007]
Fem × Nchild	-0.022***	0.018*	-0.033***	0.024**
	[0.009]	[0.010]	[0.009]	[0.011]
Urban	-0.022*	0.012	-0.014	0.000
	[0.013]	[0.015]	[0.015]	[0.018]
FBorn	0.093***	-0.065*	0.048	-0.061
	[0.036]	[0.039]	[0.032]	[0.042]
Edu2	0.052***	-0.054***	0.018	-0.016
	[0.016]	[0.018]	[0.017]	[0.021]
Edu3	0.129***	-0.131***	0.108***	-0.080***
	[0.017]	[0.020]	[0.019]	[0.022]
Observations	24,088	17,509	25,964	10,819
Mean DV	0.65	0.27	0.68	0.23

Notes: All models include a polynomial of order 3 in age and country fixed-effects. Vax is an indicator taking a value of one for vaccinated individuals (based on HFPS). Weighted least-squares using survey weights.
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Vaccination and labor market outcomes, excluding healthcare workers

NoHealth	(1)	(2)
Wave	21Q2	21Q2
Dep. Var.	Employment	LossEmp
Baseline		
Vax	0.022	-0.005
	[0.016]	[0.017]
Observations	23,277	16,795
Females		
Vax	0.042*	-0.045*
	[0.022]	[0.026]
Observations	12,317	7,941
Age1835		
Vax	0.059**	-0.034
	[0.028]	[0.033]
Observations	11,946	7,803
CoGrads		
Vax	0.044*	-0.038
	[0.023]	[0.024]
Observations	7,893	6,135
Males		
Vax	-0.002	0.031
	[0.021]	[0.023]
Observations	10,960	8,854
Age4565		
Vax	0.018	-0.010
	[0.023]	[0.026]
Observations	6,765	5,182
NoCoGrads		
Vax	0.012	0.009
	[0.019]	[0.022]
Observations	15,384	10,660
Placebo		
Vax Plan	-0.007	0.029
	[0.017]	[0.019]
Observations	17,524	12,373

Notes: Each panel restricts the estimation to different samples: females, youth, college-graduates, and so on. In all cases, healthcare workers are excluded. All models include a polynomial of order 3 in age, country fixed-effects and the control variables specified in Table 6. Survey weights used in estimation.
*** p<0.01, ** p<0.05, * p<0.1

Appendix

A Additional Tables

Table A.1: Observations by country and survey wave

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	21Q2	21Q2	21Q2	21Q2	21Q4	21Q4	21Q4	21Q4
Age group	All	18-70	All	18-70	All	18-70	All	18-70
Country	Obs.	Obs.	Pop (Mn)	Pop (Mn)	Obs.	Obs.	Pop (Mn)	Pop (Mn)
Antigua & B.	790	777	0.06	0.05				
Belice	816	805	0.23	0.22	898	885	0.23	0.22
Guatemala	1,207	1,183	9.27	8.98	1,521	1,488	9.27	8.98
El Salvador	818	802	3.54	3.44	812	788	3.54	3.41
Honduras	1,021	1,008	4.46	4.36	1,004	994	4.46	4.40
Nicaragua	833	826	3.44	3.38	865	857	3.44	3.36
Costa Rica	805	784	3.60	3.46	905	871	3.60	3.44
Panamá	815	801	2.48	2.39	986	962	2.48	2.38
Haiti	2,814	2,803	3.85	3.77	2,361	2,352	3.85	3.78
Perú	1,212	1,190	20.72	20.09	1,724	1,674	20.72	19.66
México	2,625	2,445	77.84	73.14	2,511	2,382	80.06	75.50
Argentina	1,216	1,121	27.08	25.43	1,321	1,231	27.40	25.73
Chile	1,212	1,158	14.44	13.42	1,329	1,263	14.59	13.51
Colombia	1,221	1,180	34.92	33.10	1,688	1,644	35.48	33.40
Bolivia	1,272	1,256	5.71	5.55	1,312	1,300	5.71	5.59
Guyana	785	773	0.37	0.36	875	858	0.37	0.36
Ecuador	1,352	1,329	11.23	10.70	1,615	1,592	11.23	10.72
Paraguay	1,076	1,055	4.36	4.30	1,061	1,039	4.44	4.34
Uruguay	816	773	2.60	2.39	930	878	2.60	2.40
Santa Lucía	835	819	0.13	0.13	860	847	0.13	0.13
Dominica	861	834	0.04	0.04	879	847	0.04	0.04
Rep. Dom.	1,205	1,156	6.37	6.02	1,364	1,313	6.37	6.02
Jamaica	829	804	1.92	1.81	871	850	1.92	1.83
Brazil	2,166	2,054	152.52	142.63				
LAC 22	25,646	24,905	238.60	226.47	27,692	26,915	241.93	229.21
Total	28,602	27,736	391.18	369.15	27,692	26,915	241.93	229.21

Notes: Observations by country and wave of the 2021 HFPS, population of all ages (18-98). The first wave of the survey
the second wave is 2021Q4. The population figures are obtained applying the survey weights. *LAC22* excludes Brazil and

Table A.2: Population shares by characteristic and wave (1)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wave	21Q2	21Q4	21Q2	21Q4	21Q2	21Q4	21Q2	21Q4
Country	Fem	Fem	Age60plus	Age60plus	CoGrad	CoGrad	FBorn	FBorn
Antigua & B.	53.0		19.0		35.6		0.0	
Belice	50.3	50.3	10.6	10.6	18.5	18.1	0.0	0.0
Guatemala	51.9	51.9	12.5	12.5	7.7	11.8	0.0	0.0
El Salvador	55.3	55.3	17.9	17.9	25.6	25.5	0.0	0.0
Honduras	52.5	52.5	13.4	13.4	8.9	8.4	0.0	0.0
Nicaragua	51.8	51.8	13.4	13.4	32.9	34.6	0.0	0.0
Costa Rica	49.9	49.9	18.6	18.6	17.4	17.4	0.0	0.0
Panama	50.3	50.3	18.4	18.4	37.4	38.2	0.0	0.0
Haiti	51.6	51.6	12.6	12.6	25.3	24.3	0.0	0.0
Peru	50.7	50.7	18.0	18.0	36.1	36.1	2.9	3.3
Mexico	52.0	52.0	17.3	17.3	21.7	21.1	0.0	0.0
Argentina	51.8	51.8	22.3	22.5	24.5	24.5	0.0	0.0
Chile	51.1	51.1	22.8	23.4	31.9	32.0	9.1	10.8
Colombia	52.1	52.1	19.3	19.8	27.4	27.4	4.6	4.3
Bolivia	50.3	50.3	16.1	16.1	33.6	32.5	0.0	0.0
Guyana	49.8	49.8	13.7	13.7	15.2	15.1	0.0	0.0
Ecuador	50.6	50.6	16.2	16.2	11.1	13.3	4.3	5.3
Paraguay	50.0	50.0	15.4	15.7	25.4	25.4	0.0	0.0
Uruguay	52.3	52.3	26.3	26.3	21.2	25.2	0.0	0.0
Sta. Lucia	50.7	50.7	18.0	18.0	29.9	31.8	0.0	0.0
Dominica	49.7	49.6	23.4	23.4	31.0	34.1	0.0	0.0
Rep. Dom.	50.5	50.5	16.2	16.2	32.3	26.2	0.0	0.0
Jamaica	51.0	51.0	18.7	18.7	30.4	32.3	0.0	0.0
Brazil	51.9		20.0		21.9		0.0	
LAC22	51.7	51.7	18.9	18.3	23.5	24.4	1.0	1.8

Notes: Observations by country and wave of the 2021 HFPS, population of all ages (18-98). The first wave of the survey that we use is 2021Q2 and the second wave is 2021Q4. All means are computed using the survey weights. The nativity question used to identify foreign-born individuals was only asked in Peru, Chile, Colombia and Ecuador. The zeros reported for all other countries should be interpreted as missing values instead.

Table A.3: Population shares by characteristic and wave (2)

	(1)	(2)	(3)	(4)	(5)	(6)
Wave	21Q2	21Q4	21Q2	21Q4	21Q2	21Q4
Country	Emp	Emp	FormalEmp	FormalEmp	Assets	Assets
Antigua & B.	72.4		83.7		61.7	
Belice	62.2	57.7	55.4	59.0	51.7	56.5
Guatemala	69.7	66.9	19.7	18.5	22.2	23.0
El Salvador	68.2	66.1	36.5	36.8	31.3	30.7
Honduras	54.9	57.8	22.3	21.8	20.2	21.7
Nicaragua	67.3	67.5	31.6	35.3	25.4	28.4
Costa Rica	57.0	60.8	53.3	54.1	54.3	56.5
Panama	53.4	53.1	42.1	43.3	49.9	53.1
Haiti	41.0	46.2	13.7	15.7	8.8	11.1
Peru	64.5	67.4	21.9	25.2	30.1	33.5
Mexico	65.2	66.0	32.6	36.0	45.2	44.3
Argentina	57.0	65.6	51.9	50.9	63.3	66.7
Chile	55.4	62.5	67.7	65.8	66.6	69.5
Colombia	55.7	58.5	35.5	34.9	36.0	40.8
Bolivia	72.6	72.4	25.2	25.9	37.6	40.4
Guyana	60.5	63.1	53.1	53.6	43.3	45.7
Ecuador	60.5	64.7	32.8	30.5	32.0	37.1
Paraguay	67.3	77.4	27.1	21.4	68.5	69.0
Uruguay	57.1	61.0	62.6	68.2	73.8	74.9
Sta. Lucia	65.5	69.1	57.4	62.6	59.5	61.5
Dominica	67.7	66.0	64.6	64.6	54.9	60.6
Rep. Dom.	61.4	60.0	42.1	38.7	65.2	65.3
Jamaica	63.1	65.7	47.3	53.6	47.4	53.9
Brazil	57.7		64.1		48.7	
LAC22	60.0	64.2	46.5	37.3	45.9	46.0

Notes: Observations by country and wave of the 2021 HFPS, population of all ages (18-98). The first wave of the survey that we use is 2021Q2 and the second wave is 2021Q4. All means are computed using the survey weights. Formal employment is conditional on employment hence it is the share of formally employed among the employed. Assets is an indicator taking a value of one for individuals with high numbers of assets. Because of a change in the phrasing of the question, the indicator takes a value of one for individuals with 3 or more assets in wave 1, and for individuals with 2 or more assets in wave 2. With our definition the share of individuals in LAC22 with high assets in wave 1 is 45.9% and in wave 2 it is 46.0% (both computed using survey weights).

Table A.4: Unconditional immunization gaps by country

Ctry	Wave	Obs.	(1) Female	(2) Age60plus	(3) CoGrad	(4) FBorn	(5) Employed	(6) FormalEmp	(7) Assets
LAC24	1	28602	0.034***	0.381***	0.072***	-0.156***	-0.055***	0.067***	0.027***
LAC22	2	27692	0.012	0.134***	0.062***	-0.146***	-0.012	0.064***	0.041***
LAC22	1,2	56294	0.026***	0.288***	0.068***	-0.150***	-0.003	0.066***	0.032***
ATG	1	790	0.032	0.148**	0.132***		0.076*	0.163**	0.07
BLZ	1,2	1714	-0.011	0.242***	0.147***		0.073***	0.134***	0.059**
GTM	1,2	2728	0	0.158***	0.126***		-0.002	0.136***	0.125***
SLV	1,2	1630	-0.03	0.295***	0.152***		0.01	0.150***	0.131***
HND	1,2	2025	-0.019	0.279***	0.150***		0.033*	0.186***	0.104***
NIC	1,2	1698	0.01	0.424***	0.094***		-0.039*	0.017	0.056**
CRI	1,2	1710	0	0.410***	0.093***		-0.035	0.005	0.006
PAN	1,2	1801	0.008	0.237***	0.060***		0.02	0.096***	0.072***
HTI	1,2	5175	0.002	0.055**	0.057***		0.006	0.061**	0.099***
PER	1,2	2936	-0.011	0.561***	0.046**	-0.082	-0.033**	0.078**	0.061**
MEX	1,2	5136	0.034**	0.269***	0.083***		-0.025**	0.033*	0.007
ARG	1,2	2537	0.021	0.331***	0.101***		-0.080***	0.058**	0.015
CHL	1,2	2541	-0.014	0.107***	0.041***	-0.067**	0.022*	0.056***	0.01
COL	1,2	2909	0.036	0.498***	0.019	-0.281***	-0.073***	0.096***	0.127***
BOL	1,2	2584	-0.021	0.334***	0.151***		0.002	0.196***	0.124***
GUY	1,2	1660	-0.042*	0.194***	0.005		0.050**	0.112***	0.040*
ECU	1,2	2967	-0.001	0.168***	0.052***	-0.062**	0.021*	0.083***	0.030*
PRY	1,2	2137	-0.050*	0.207***	0.037		-0.001	0.114***	-0.069**
URY	1,2	1746	0.049**	0.064***	0.116***		0.01	0.109***	0.065***
LCA	1,2	1695	0.065**	0.251***	0.193***		0.04	0.109***	0.144***
DMA	1,2	1740	0.132***	0.126***	0.053*		-0.018	0.067**	0.070***
DOM	1,2	2569	-0.001	0.094***	0.069***		0.024	0.154***	0.01
JAM	1,2	1700	0.059**	0.188***	0.117***		0.014	0.134***	0.119***
BRA	1	2166	0.056***	0.215***	0.063***		-0.021	0.053*	-0.002

Notes: HFPS survey waves 1 and 2 refer to 2021Q2 and 2021Q4, respectively. Vaccination gaps for the LAC region estimated using regression models that include country fixed-effects. The country-specific gaps are estimated separately on each country's subsample. The dependent variable is indicator $Vax_{i,c}$, which takes a value of one if individual i from country c had received at least one immunization dose. Each column (and row) correspond to a different model, which vary according to the social group indicator variable (female, college educated, and so on). All estimates use survey weights. Formal employment is conditional on employment. Assets is an indicator taking a value of one for individuals with above-median assets. Heteroskedasticity-robust standard errors. *** p<0.01, ** p<0.05, * p<0.1