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The contribution of the immigrant population to the U.S. long-term care workforce

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Abstract: *The long-term care (LTC) sector will soon face a shortage of care workers. The consequences are potentially dramatic, urging the need to design policies aiming at reducing the turnover rate of LTC workers. Immigrant workers are an important part of the LTC workforce. Pooling data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey (CPS) for years 2003-2019, we compare US-born citizens and immigrant LTC workers' propensity to stay in the LTC workforce over one year. We distinguish two categories of LTC workers: personal care workers and nurses. We show that for both categories, naturalized citizens, legal noncitizen immigrants, and unauthorized immigrants have a higher probability of staying in the LTC workforce compared to US-born citizens. We provide two potential explanations: we show that immigrant personal care workers are more likely to report a better health, and that immigrant nurses have a lower wage variation sensitivity. Our results also suggest that wage increases are likely to be associated with high retention rates in the profession.*

Keywords: *long-term care; workforce, aging; immigration*

JEL codes: *CO1, JO8, I18*

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1. Introduction

In the United-States, the long-term care (LTC) sector faces a shortage of care workers, raising the need for action (OECD, 2020; Osterman, 2017). Indeed, in 2011 over a third of community-dwelling elders needing LTC have faced at least once some issues related to unmet self-care need, which lowered their quality of life (Allen et al., 2014; Freedman and Spillman, 2014).

The situation is not new, but it has been worsening overtime due to the US population ageing (Rapp and Rocard, 2020). Since the late nineties, LTC occupations have been one of the fastest-growing occupation sectors (BLS, 2019). There has been a sharp increase in the number of frail and disabled elders needing comprehensive LTC services and supports (Lin et al., 2012; Lynn, 2013), while Medicaid spending towards home and community-based services increased a lot, which improved elders' capacity to pay for LTC services (Rosenfeld and Russell, 2012; Spetz et al., 2015). However, the average LTC supply growth rate in the US (nurses and personal care workers providing care in nursing homes or a home) was only 3% over the 2003-2018 period, which was ten times lower than the demand growth rate (OECD, 2019; Rapp and Rocard, 2020). Among many factors, the presence of high turnover rates within the LTC workforce contributes to explain this situation (Baughman and Smith, 2012; Frogner and Spetz, 2015; Rapp and Rocard, 2020; Stone and Harahan, 2010).

Attracting more immigrant workers in the LTC workforce has been one recurrent policy suggested over the past ten years to solve this issue (Browne and Braun, 2008; Colombo et al., 2011a, 2011b; Fujisawa and Colombo, 2009; OECD, 2020). Recent findings show that around a quarter of LTC workers are immigrants, including naturalized citizens, legal and unauthorized immigrants (Zallman et al., 2019), and that non-U.S. citizens are less likely to leave the LTC workforce than U.S. citizens (Frogner and Spetz, 2015). However, while prior research has documented the characteristics of the foreign-born LTC workforce,

there is to the best of our knowledge no empirical evaluation of their retention probabilities. Little is known on the potential impact of a policy aiming at attracting more immigrants in the LTC workforce. The impact of such a policy is not straightforward. Indeed, 90% of the LTC workforce is composed of women (Frogner and Spetz, 2015; OECD, 2019; Zallman et al., 2019), and there is evidence that immigrant women's labor supply tends to be lower than US-born citizens' (Borjas, 2017, 2003). Moreover, prior work suggests that even if immigrants are more likely to be recruited in the LTC workforce, the issue of their retention could be as problematic as it is for the US-born workers (Colombo et al., 2011a).

In this paper, we evaluate the latest available data on the number of foreign-born and domestic-born LTC workers in the US to explore the contribution of immigrant workers to the LTC workforce. Specifically, we compare US-born and immigrant LTC workers' propensity to stay in the LTC workforce over one year. We explore retention rates among naturalized citizens, legal noncitizen immigrants, and unauthorized immigrants.

2. Methods

2.1. Data, definition, and sample

We pool data from the Annual Social and Economic Supplement of the Current Population Survey (ASEC-CPS) for years 2003-2019, provided by IPUMS-CPS (Flood et al., 2019). The ASEC-CPS is a random sample of about 190,000 individuals interviewed nationwide. Interviews include detailed information about respondents' socio-economic status (marital status, gender, age, ethnicity, citizenship, income, education etc.) as well as detailed information about respondents' labor force status (employed, unemployed, part-

timer, full timer, etc.), work occupation and industry codes (North American Industry Classification System) provided by the US Census².

In these data, we determine whether a respondent is a LTC worker using the OECD's definition of the LTC workforce (OECD, 2020). According to that definition, the LTC workforce is composed of nurses and personal care workers providing help at home or in institution. Table 1 provides a description of the occupations and industry codes to identify LTC workers³. Nurses are reporting one of the following occupations: registered nurses, midwives, nurse practitioners, and licensed practical nurses or licensed vocational nurses (census codes 3255, 3258, and 3500). Personal care workers are reporting an occupation that is either personal care or home care aides (census code 4610), or nursing, psychiatric, and home health aides (census code 3600). LTC workers report working in the following industries: home and health care services and private home health services, nursing care facilities, and residential care facilities without nursing (respectively, census codes 8170 and 9290, 8270, and 8290).

-Insert here Table 1-

The ASEC-CPS data provide information for two periods: the current year (t), and the year prior to the survey ($t-1$). We analyze retention rates observed in year t among people who participated in the LTC workforce during year $t-1$. Our data represent a total of 22,005 observations for respondents who participated in the LTC workforce in year $t-1$ (pooled over

² <https://www2.census.gov/programs-surveys/cps/methodology/Industry%20Codes.pdf>

³ Changes in the census classification must be taken into account when looking at yearly trends. Specifically, midwives are included in the LTC workforce after 2012, because of changes in the census classification between 2011 and 2012, that created that a category “nurses midwives and nurse practitioners”. Prior to 2013, nurse midwives are therefore not included in the LTC workforce. Therefore, one could argue that increases in the LTC workforce between 2012 and 2013 could be due to the inclusion of midwives after 2012.

the 2003-2019 time period), which are composed of 5,474 observations for LTC nurses (25.1%) and 16,531 observations for personal care workers (74.9%).

2.2. Defining LTC stayers vs. leavers

In the ASEC-CPS data, job occupation and industry information are provided for the current year (t) and for the year prior ($t-1$) to each interview. Therefore, we can compute turnover rates over one year, by observing changes in the labor force occupations, sectors, and status between year $t-1$ and year t (Frogner and Spetz, 2015). Stayers are defined as respondent who declare being in the LTC workforce in both years (in→in), and leavers are respondents who participate in the LTC workforce in the first year, but not in the second year (in→out). It is important to note that the latter category includes both respondents who stayed in the labor force or not. Indeed, previous research indicates that LTC workers are likely to become unemployed after a year of participation in the LTC workforce (Frogner and Spetz, 2015). Moreover, stayers also include LTC workers who can change occupations between two years within the LTC workforce (personal care workers becoming LTC nurses).

2.3. Definition of immigration

Our immigration variables come from self-reported citizenship status. Immigrants are classified in a group reporting that they are foreign born. Among them, we find US citizens (by naturalization) and non-US citizens. Using an algorithm defined by Borjas (2017), it is possible to get a fair estimation of the number of unauthorized immigrants in the LTC workforce in the ASEC-CPS data (Zallman et al., 2019). Following prior work (Borjas, 2017; Zallman et al., 2019), we classify foreign-born workers as legal immigrant if they comply with one of the following conditions: they arrived before 1980, they are US citizens, they

receive public benefits (Medicaid, Medicare, Military insurance, Social Security benefits, public housing, or rental subsidies), they were born in Cuba, their spouse is a legal immigrant or US citizen, and they hold a work that implies a license or certification. The residual immigrants are unauthorized immigrants, i.e. those who do not meet all of these criteria. While this classification is subject to some limitations (variables are self-reported, and unauthorized immigrants are more likely to hide), there is evidence that when applied to the ASEC-CPS data, this classification is accurate, and that results are consistent with those obtained from the Pew Research Center (Borjas 2017). Finally, following prior work (Zallman et al., 2019), we create a separate category for naturalized citizens, who are by definition foreign-born.

2.4. Determinants of the decision to stay in the LTC workforce

We model transition decisions by estimating the following logit model in our sample of respondents who participated in the workforce during the prior year ($t-1$):

$$\log \frac{p_i}{1-p_i} = \beta_0 + \beta_1 M_i + X_i \theta + \delta_t + \varphi_i + \varepsilon_i \quad (1)$$

where p_i is the probability of being a LTC worker in year t (in→in). The variable M_i measures whether the respondent is an immigrant (either naturalized citizens, legal noncitizen immigrants or unauthorized immigrants) or not. The parameter β_1 measures deviation between the LTC workforce participation rate of immigrants vs. US-born respondents. Depending on the specifications, M_i is replaced by three dichotomous variables, N_i , L_i , and U_i , which respectively indicate whether respondents are naturalized citizens, legal noncitizen immigrants, or unauthorized immigrants. The parameter X_i is a vector of socioeconomic characteristics including: ethnicity (White vs. Black, White vs. Other ethnicities), education

attainment (less than high school diploma, high school graduate, has some college, or holds a bachelor's degree or more), age (five-year categories: 20-24, 25-29 etc.), gender, state of residence, metropolitan status (urban vs. rural), and δ_t is a vector of year dummies. Finally, φ_i measures state-level fixed effects. Note that to ease the comparison with Borjas (2017), we reproduce the same notation as in his article.

Following Borjas (2017), we can use equation (1) to “smooth-out” the age-turnover profiles by controlling for a vector of variables A_i , which contains a fourth-order polynomial in person i 's age. To estimate the predicted staying rates differentials between US-born and immigrant workers across the life cycle, we simply control for the interactions between A_i and migration status. We can also use equation (1) to explore the probability that LTC workers experience health issues, by replacing p_i with a dummy variable indicating if the LTC worker reports a good health (vs. fair or poor). Under this specification, the coefficient β_1 indicates whether immigrants are more likely to face a health issue, compared to US-born citizens. We run another model exploring the risks of health issues among people who participate in the LTC workforce during the current year.

We run separate analyzes in the overall LTC workforce sample, among LTC nurses only, and personal care workers only. In all models, we compute marginal effects, which allows to interpret the influence of the migration status on the predicted probability of staying in the LTC workforce. Note also that the ASEC-CPS sample weights were applied to all regressions.

2.5. Health status

A large body of the migration literature has documented the existence of a so-called “healthy immigrant” effect. In a nutshell, immigration implies a selection of the people, the healthiest persons being more likely to successfully immigrate (Fennelly, 2007; Razum,

2008). We run additional regressions to explore the correlation between immigration status and self-reported health (at the extensive margin) among those who participated in the LTC workforce in the prior year.

2.6. Sensitivity to wage variations

Immigrant workers lower wage variation sensitivity than US-born citizens could explain different retention rates between the two categories of workers. Indeed, the LTC hourly wages only increased by \$2 over the years 2003-2017 (BLS, 2019), reducing the attractiveness of the LTC industry among workers sensitive to wage increases in other sectors. Exploring the impact of wage changes on the propensity to participate in the LTC workforce at the micro-level raises endogeneity issues because it is likely that unobserved job characteristics are driving both tenure and wage levels. Baughman and Smith (2012) identify three instrumental variables (IV) that are likely to be correlated with wages but not with job supply intensity: the presence of Medicaid wage pass-through programs, the state-level median wage for personal workers, and the individuals' starting wage. We collected pass-through programs information as well as the median LTC workforce wage over the period 2006-2016 using the LTC focus website (<http://ltcfocus.org>), and used both variables to instrument wages in the equation exploring the impact of wages on the probability of staying in the LTC workforce. However, none of these IVs were good predictors of LTC workers' wages in our sample, leading us to reject that identification strategy (results are available upon request).

Therefore, we explore to what extent wage increases are associated with retention rates increases among US-born citizens and immigrant workers, at a more aggregated level. Again, we refer to the methodology defined in Borjas (2017) to estimate the LTC labor supply elasticity: we aggregate our data into age-education-nativity groups in each year and

use these data to estimate several models. Specifically, we classify individuals into 36 skills groups, depending on their education attainment (4 groups: less than high school diploma, high school graduate, some college, and college graduate), age category (9 groups ranging from 20-24 to 60-64), and nativity (immigrant groups vs. US-born). We then compute the “market wage” for each age-education group at each year, and use that variable to estimate the following model (again, note that to ease the comparison with Borjas (2017), we reproduce the same notation as in his article):

$$\begin{aligned}
LTC_{asnt} = & \phi_a + \phi_s + \phi_n + \phi_t + \phi_{at} + \phi_{st} + \phi_{nt} + \phi_{asn} \\
& + \sigma_A(\log w_{ast} \times A) + \sigma_N(\log w_{ast} \times N) + \sigma_L(\log w_{ast} \times L) + \sigma_U(\log w_{ast} \times U) \\
& + \varepsilon_{asnt} \quad (2)
\end{aligned}$$

where LTC_{asnt} is the averaged measure of LTC work supply for cell a,s,n,t (namely age, education, nativity status, time), $\log w_{ast}$ is the mean log wage of LTC workers in the specific age-education group at time t , $\sigma_N, \sigma_L, \sigma_U$ are the estimator of the effect of a change in wage on labor supply respectively among US-born citizens (A), naturalized citizens (N), legal noncitizen immigrants (L), and unauthorized immigrants (U). The parameters ϕ_a, ϕ_s, ϕ_n are fixed effects for respectively: age, education, nativity status. We interact these fixed effects with time fixed effect ϕ_t to allow for the impact of age, education and immigration status to vary over time. We also control for an interaction between age, education and nativity status (ϕ_{asn}) to control for changes occurring within each age-education-nativity group. We run two models where the dependent variables measure: (1) the probability of staying in the LTC workforce, (2) the probability of having a full-time equivalent (FTE) job, e.g. working more than 40 hours a week. Because it estimates correlations among aggregated groups of similar workers, this methodology allows removing the influence of unobserved

individual preferences on the LTC workforce participation, which reduces the potential correlation between the individual idiosyncratic error term (ε_{asnt}) and our independent variable of interest ($\log w_{ast}$).

Again, we run all models on our three samples: in the overall LTC workforce sample, among the subsample of LTC nurses, and among personal care workers. Note also that in all analyzes we do not run separate models for estimating Eq. (2) for men and women, for two main reasons: first, we do not find gender differences associated with the decision to stay in the LTC workforce (see next section); second, we work on a small sample and subgroup analyzes tend to reduce the robustness of our estimates. Finally, we used the ASEC-CPS weights in all regression models.

3. Results

3.1. Descriptive statistics

Table 2 shows the importance of immigrant workers in the overall sample aggregating nurses and personal care workers. In this sample, 22.50% of the LTC workforce is foreign-born. Among them, 10.30% are naturalized citizens, 7.15% are legal noncitizen immigrants, and 5.05% are unauthorized immigrants. These proportions are similar to prior estimates (Zallman et al., 2019). Note also that there are fewer unauthorized immigrants in the LTC workforce than in the overall US working population. The difference is explained by the fact that a quarter of LTC workers are nurses, who hold licenses and/or certifications (see Table 3).

-Insert here Table 2-

Table 3 provides a description of our sample of LTC workers. Respectively 80.7% and 79.3% of the LTC nurses and personal care workers stayed in the LTC workforce over two consecutive years. The proportion of US-born workers is higher among LTC nurses than among personal care workers (respectively 82.8% and 74.6%). Not surprisingly, LTC nurses also have higher education levels (88.8% of them have university degrees vs. 43.7% for personal care workers). There are more workers from racial minorities among personal care workers (43.6%) than among LTC nurses (29.8%). Finally, LTC nurses are on average two year older and report a better health than personal care workers. It is worth noting that there are very few men in these occupations, and therefore we decided not to disaggregate men and women (as usually done in labor economics models).

-Insert here Table 3-

3.2. Differences in staying rates between US-born citizens and immigrants

Table 4 presents the results of the logit regressions shown in Eq. (1). Overall, immigrants have a 7.6 percent point (pp) increased probability of staying in the LTC workforce, compared to US-born citizens ($p < 0.01$). We find that all immigration categories have higher probabilities of staying in the LTC workforce compared to US-born citizens: +7.5 pp ($p < 0.01$) for naturalized citizens, +8.0 pp ($p < 0.01$) for legal noncitizen immigrants, and +7.6 pp ($p < 0.01$) for unauthorized immigrants. The effect observed for the overall LTC workforce seems to be driven by personal care workers. Immigrant personal care workers have an 8.7 pp higher probability of staying in the LTC workforce, while the association is lower for LTC nurses (+4.8 pp). Among them, unauthorized immigrants have the highest probability of staying (+9.7 pp vs. +8.3 pp and +8.5 pp for naturalized citizens and legal

noncitizen immigrants, respectively). Among LTC nurses, naturalized citizens have a lower probability of retention (+5.8 pp) than legal noncitizen immigrants (+7.1 pp).

In the overall LTC workforce, we find that higher education levels are associated with a significant decrease in the probability of staying in the LTC workforce. On average, LTC workers with a bachelor's degree or more have a 3.4 pp lower propensity to stay in the LTC workforce, compared to individuals who have less than a high school diploma ($p < 0.01$). Note also that high school graduates and workers with some college education do not have different retention rates, compared to those who have less than high school diploma. This education-related effect is driven by personal care workers. Among them, those who have at least a Bachelors' degree diploma have a 6.2 pp lower probability of staying in the workforce. In the LTC nurse sample, education is not associated with retention rate differences. Finally, we find that race accounts for significant differences in staying rates: compared to white workers, Black workers have a greater chance of staying in the LTC workforce (+1.6 pp, $p < 0.1$) while other ethnicities have a 3.2 pp lower ($p < 0.01$) chance of staying.

We further stratified the analyses by immigration status within each LTC occupation (results available upon request). We found that among nurses, education has a positive impact but only among immigrants ($p < 0.01$; non-significant effect among US-born). Among personal care workers, the negative effect of the highest level of education ($>$ bachelor's degree) on retention rates was driven by the US-born workers ($p < 0.01$; non-significant effects among immigrants).

- Insert here Table 4 -

3.3 Differences in retention rates across the life cycle

Table 4 shows that age is a strong determinant of retention in the LTC workforce overall, and that this effect is driven by personal care workers. Indeed, age is not significantly correlated with the probability of staying in the LTC sector among nurses, while personal care workers over 25 years old have a greater probability of staying in the LTC workforce compared to the age group below 25 years old.

Overall, Figures 1a, 1b, and 1c highlight that naturalized citizens, legal noncitizen immigrants, and unauthorized immigrants have a greater propensity of staying in the LTC workforce than US-born citizens over the life cycle. Among personal care workers, our estimates confirm that unauthorized immigrants have the greatest tendency to stay in the LTC workforce. The difference between unauthorized immigrants and US-born workers is larger when workers reach 36 years old (Figure 1c: 10.9 pp). Note also that naturalized citizens and legal noncitizen immigrants have a similar probability of staying in the LTC workforce, especially among personal care workers (Figure 1b). Finally, Figure 1c highlight that among personal care workers, the probability of staying in the LTC workforce increases with age in all nativity groups, except among naturalized citizens whose staying rates tend to decline after 50 years old to converge towards US-born citizens' rates at 65 years. Figure 1b shows that the staying curve among US-born LTC nurses is flat among US-born citizens, while non-linear among naturalized citizens and legal noncitizen immigrants.

-Insert here Figure 1-

3.5. Is there any evidence of a “healthy immigrant” effect?

Table 5 shows that in the LTC workforce sample, immigrants have a significantly higher probability of reporting a good health compared to US-born ($p < 0.05$). However, the difference is small: immigrants have a 1.5 pp higher probability of reporting a good health in

current year when they participated in the LTC workforce in the prior year. Again, this effect is driven by personal care workers (+2.6 pp, $p<0.01$), and among them, by the unauthorized immigrants. Compared to US-born, naturalized citizens and unauthorized immigrants have higher probabilities of reporting a good health (respectively: +2.3 pp increase ($p<0.05$) and +6.0 pp increase ($p<0.01$)).

- Insert here Table 5 -

3.6. Are immigrants less sensitive to wages than US-born citizens?

Table 6 reports the results (marginal effects) from Eq. (2) estimating LTC workers' wage elasticity according to the nativity status. In all models, the correlation between wage variations and the LTC work supply is positive. In the overall LTC workforce, a 10% increase in wages is correlated with a 1.53 pp increase in the probability of staying in the LTC workforce among US-born citizens ($p<0.01$), a 0.96 pp increase in the probability of staying among naturalized citizens ($p<0.01$), a 1.63 pp increase in the probability of staying among legal noncitizen immigrants ($p<0.01$), and a 1.50 pp increase among unauthorized immigrants ($p<0.1$). Note that the use of a Wald test revealed that the wage-elasticity are not significantly different across groups (US-born vs. naturalized citizens: $p=0.09$; naturalized citizens vs. legal noncitizen immigrants: $p=0.26$, US-born vs. legal noncitizen immigrants: $p=0.83$).

This effect seems to be driven by personal care workers' wage sensitivity. Indeed, a 10% increase in wages is associated with a 0.96 pp increase in US-born LTC nurses' probability of staying ($p<0.01$) vs. a 1.67 pp increase in US-born personal care workers' probability of staying ($p<0.01$). In the LTC nurses' sample, the wage-sensitivity among immigrant workers is not significant. On the contrary, among personal care workers, a 10% increase in wages is associated with a 9.4 pp increase in naturalized citizens workers'

retention rates ($p < 0.05$), a 1.83 pp increase in legal noncitizen immigrants' retention rates ($p < 0.01$), and a 1.4 pp increase in unauthorized immigrants' retention rates ($p < 0.05$).

Finally, in the overall LTC workforce, wage increases are not correlated with differences in the probability of working full-time among US-born and naturalized citizens, but changes are significant among legal noncitizen immigrants and unauthorized immigrants. Indeed, a 10% increase in wages is associated with a 1.30 pp ($p < 0.05$) and 1.86 pp ($p < 0.01$) increase in the probability of working full-time among legal and unauthorized immigrants, respectively. Again, there are differences between nurses and personal care workers. US-born nurses have a greater probability of working full-time when wages increase (0.97 pp, $p < 0.05$), while the association is not significant in the personal care workers sample. Indeed, a 10% increase in wages only increases personal care workers' probability of working full-time when they are unauthorized immigrants (+1.53 pp, $p < 0.01$).

-Insert Table 6 here-

4. Discussion

4.1 Interpretation of main findings

This article shows that approximately 80% of the LTC workers stay in the LTC workforce over one year. The tenure rates reported in this study are higher than rates reported in previous research, where almost a third of the workforce was replaced every year (Frognier and Spetz, 2015; Smith and Baughman, 2007). One potential explanation for this difference is that the OECD LTC workforce definition excludes hospital-based workers, where turnover rates among new nurses can be high (Kovner et al., 2016).

Our analyses suggest that immigrant workers are more likely to stay in the LTC workforce, especially among personal care workers, and regardless of their current status

(naturalized citizens, legal noncitizen immigrants or unauthorized immigrants). Therefore, we confirm that immigrant workers are an important part of the LTC workforce. They offer the U.S. the possibility to fill roles that are not currently filled from the domestic labor market alone and contribute to stabilize the LTC services supply. To the best of our knowledge, this article provides the first results documenting this issue.

A potential explanation found in our sample is that immigrant personal care workers are on average in a better health than US-born workers, and therefore more likely to keep up doing physical jobs. This result is particularly strong for unauthorized immigrants, who seem to be less likely to face issues that permanently exclude them from the LTC workforce. This explanation is in line with previous findings showing that in the LTC workforce leaving rates are partly explained by the fact that a large part of workers experience disability issues (Frogner and Spetz, 2015), while the chances to return to the LTC workforce after facing disabilities are likely to be small.

While they must be interpreted with caution, our findings also suggest that retention rates are associated with wage variations. Decisions to stay in the LTC workforce seem to be very sensitive to wage variations, especially among US-born LTC nurses, and all personal care workers. Moreover, US-born LTC nurses and unauthorized immigrants are more likely to work full time when LTC wages increase. That wages in the LTC sector have remained consistently low for the past 20 years could contribute to explain the low retention rates in the profession. In particular, recent work shows that LTC workers have lower wealth and greater risks of facing poverty than other workers (Muench et al., 2020).

Our results confirm previous research underlining that age is one of the main drivers of turnover decisions in the LTC workforce (Baughman and Smith, 2012; Frogner and Spetz, 2015; Osterman, 2017). We show that US-born personal care workers' participation rates slightly increase across the lifecycle, and that the participation gap between US-born and

immigrant workers remains the same as workers get older. A potential explanation could be that personal care workers choose to stay involved in elderly caring because they develop certain aptitudes. Before the age of 30, it is likely that LTC workers may decide to leave the workforce to participate in different caring activities (like for instance childcaring). After 50 years old, it may be too late for legal noncitizen immigrants and unauthorized immigrants to change, and they keep participating in the LTC workforce until the retirement age. The situation is different for LTC nurses, whose retention rates remain flat across the lifecycle, with a downward trend after the age of 55. This issue is preoccupying because the LTC sector increasingly needs skilled workers. Having LTC workers enrolled in long-lasting careers is very important to ensure a better quality of services. Indeed, several tasks given to LTC workers imply learning-by-doing aspects, which cannot be ensured if the workers do not get sufficient experience.

Most of personal care positions are low-skilled, and it is likely that highly qualified workers are less likely to consider these jobs in a long-term perspective (Rapp, 2020)⁴. In other words, workers whose education level is higher than the level required for direct care work may view these jobs as a temporary position, while they pursue employment that will match their formal education. Our analyses confirm the influence of education among personal care workers but only in the US-born group: for them, higher education is negatively correlated with the probability of staying in the LTC workforce. This result raises concerns with both the personal care workers' qualification and LTC supply quality. The situation for nurses is different. Indeed, education has a positive association with retention only among immigrants. This result shows that the immigrant LTC nurses contribute to the quality of LTC services, as they are more likely to stay in the LTC workforce when they are more

⁴ One could argue that immigrant nurses could be likely to take personal care positions when they arrive to the U.S., in order to have an income source while they wait for the receipt of a licence or certification. However, the negative effect of education is obtained in regressions that control for immigration status.

educated. One explanation for this result is that foreign LTC nurses are generally selected by specialized agencies that organize their venue to the US.

4.2. Limitations

Our results face three main limitations. First, while we contribute to better understand and describe the US LTC workforce turnover, our analyses are mainly descriptive. This limitation is mainly due to our data, which do not allow longitudinal/causal analyses. The use of panel data would have allowed exploring the dynamic dimension of LTC workforce participation choices, and to control for time-invariant unobserved factors that explain the decision to stay in the LTC workforce (using fixed-effect specifications).

Second, it is possible that our immigration variable is endogenous to the decision to participate in the LTC workforce. Indeed, previous research provides evidence that networks of immigrants make it more likely to find them in some specific tasks. In our case, workers from the Philippines or Mexico are more likely to move to the U.S. to participate in the LTC workforce. They respectively represent 17.8% and 13.4% of LTC workers in our sample, while none of the other foreign citizenships represent more than 2%. This certainly shows that these immigrant workers benefit from specific networks or niches. This would imply that the effect of immigration on LTC staying behavior could be over-estimated.

Third, we cannot explore the true labor supply elasticities, since we were not able to successfully instrument wages. Our results about the association between wages and LTC labor supply could overestimate the impact of wage changes on tenure decisions. We used aggregate estimates of wages (Borjas, 2017) in order to mitigate endogeneity issues and decrease the magnitude of the bias. Moreover, our results are consistent with prior work estimating that a \$1 increase in LTC hourly wage was found to reduce the LTC workers'

propensity to leave the workforce by 2% for a given month (Baughman and Smith, 2010), which supports our findings in showing actually greater wage elasticity.

4.3. Policy implications

According to our calculations, the LTC workforce size has decreased by 3.78% between 2018 and 2019, falling from 1,322,998 workers in 2008 to 1,272,999 workers in 2019 (source: ASEC-CPS, extrapolated to the US population using the ASEC person-level weights). Based on our estimations, it is possible to explore the potential implications of three different policies that could be realistically implemented to foster LTC workers retention: increasing immigration, directly increasing hourly wages, and legalizing the unauthorized immigrants.

We use prevalence estimates of staying rates among US-born citizens and immigrants in 2019 combined with wage variation sensitivity estimates calculated in Table 6 to explore the potential association between these policies and both i) retention rates and (ii) LTC workforce size in 2019. Note again that since our estimates of wage elasticity may not be identifying causal relationships, the following estimates should be interpreted with caution. Because we are not able to analyze a causal pathway, these results are only correlations, and should not be used to make policy recommendations, particularly when options such as wage changes have endogeneity issues.

Given the important contribution of immigrant workers to the LTC workforce, a first policy could be to increase their participation in the LTC workforce. Previous work suggests that international recruitment of LTC workers can be developed through family-reunion programs, skilled-workers and professional visas, temporary student visa (Fujisawa and Colombo, 2009; Rapp and Rocard, 2020). Our results showing higher staying rates among immigrants (Table 4) suggest that such a policy is likely to contribute to expand the

workforce. However, while the direct impact of such a policy on the retention rates is clear, one could argue that this type of policy also may have a (negative) indirect impact, through its effects on wages. Indeed, the impact of immigration on wages is unclear. While some evidence suggest that this impact is close to zero in the overall labor force (Borjas 2003), research focusing on nurses provide evidence of a negative impact: a 10% increase in immigration supply would reduce nurses' salary by 1 to 4 pp (Kaestner and Kaushal, 2012). In the absence of evidence of the impact of immigration on LTC workers' wages, we define five scenarios, where decreases in wages range from 4% ("worst" case scenario) to 0% ("best" case scenario). According to our calculations (Appendix A, Tables A1 to A3), in all scenario generating a decrease in LTC wages (by 1 to 4%), a 10% increase in immigration would decrease overall retention rates by respectively -0.63%, -0.44%, -0.25%, and -0.06%. In the best-case scenario (no change in hourly wages), the retention rate would increase by 0.12%, corresponding to 1,586 additional workers that would have been retained in 2019 (respectively -158 nurses and +2142 personal care workers).

A second policy could to be to legalize the unauthorized immigrants who already participate in the LTC workforce. Indeed, staying rates are higher among legal (80.86% between 2018 and 2019) compared with unauthorized immigrants (75.04% between 2018 and 2019). Thus, we can expect that legalization of unauthorized immigrants would increase overall retention rate. In Appendix A, we show that legalization of 10% of unauthorized immigrants (thus increasing their proportion from 8.21% to 8.52%) would have a rather low impact as it would increase LTC retention rates by 0.03%, corresponding to 369 additional LTC workers retained in 2019.

To better understand the potential correlation between promoting immigrant recruitments and retention rates, we can compare them to a policy aiming to increase the hourly wage of LTC workers. Such a policy could increase staying rates, but also working

time (Llena-Nozal et al., 2020). In the U.S., the median hourly wage for LTC workers has remained low over the decade 2006-2019. We explore the impact of a 10% increase in wages, which is close to the increase (12%) introduced by the Medicaid wage pass-through programs, which were implemented in 20 states between 1996 and 2001 (Baughman and Smith, 2010). Our calculations suggest that such a policy could be effective, as it could increase LTC retention rates by +1.90% (95% CI: 1.25% - 2.55%), corresponding to a potential increase of 24,201 additional LTC workers (95% CI: 15,885 - 32,517) in 2019, further decomposed in stratified analyses as +4016 nurses (95% CI: 1,619 - 6,413) and +19,006 personal care workers (95% CI: 13,800 - 24,212).

5. Conclusion

Over the past years, the US implemented several measures to increase the supply of LTC services, including public funded training, wage and benefits increases, improvement in working conditions, management improvement, career creation, workforce certification and planning (Colombo et al., 2011a; OECD, 2020; Osterman, 2017). However, these actions did not successfully improve the retention rate in the LTC workforce, raising the need to design better policies (OECD, 2020). Our analyses reveal that immigrant workers are more likely to stay in the LTC workforce, but also suggest that their staying rates have lately converged towards US-born workers' staying rates, raising the need for action. Our results suggest that while policies targeting the recruitment of foreign-born workers are likely to improve the retention rates, the first priority could be given to increasing LTC workers' hourly wages, which has by far the largest impact.

While our results suggest that recruiting more immigrant LTC workers is likely to improve retention rates, previous research underlines that the employment of foreign-born

workers is likely to raise large challenges (Fujisawa and Colombo, 2009; OECD, 2020). Indeed, there is need to ensure that foreign workers comply with standards of quality of care and are well integrated in the overall LTC workforce. Evaluating these issues is not straightforward: while foreign LTC workers tend to be more experienced than their US-born counterparts - which reduces their propensity to make harmful medical errors - they also have on average lower education levels, and tend to have a higher failure rate at U.S. licensing examinations (Redfoot, 2005).

Moreover, there is need to ensure that these foreign workers get access to health insurance, and have their rights protected (OECD, 2020). Prior work shows that recipient countries have been sometimes reluctant to establish effective ethical codes of recruitment practice (Connell et al., 2007). Communication between care providers could reduce the risks of stereotypes and isolation issues related to diversity in the workplace (Dreachslin et al., 2000). Finally, a potential adverse effect of increasing the supply of immigrant LTC workers could be to deteriorate the living and working conditions of unauthorized immigrants.

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7. Figures

Figure 1: Predicted probability of staying into the LTC workforce across the lifecycle

Figure 1a: Overall
LTC workforce

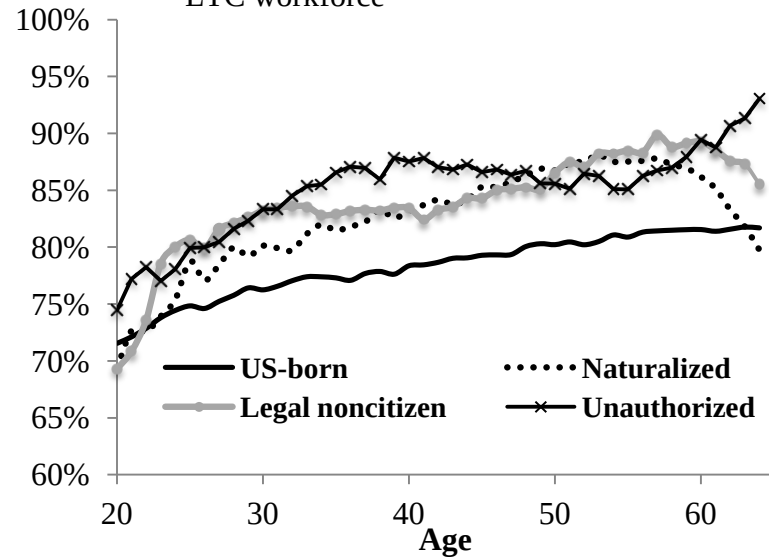


Figure 1b: Among
LTC nurses

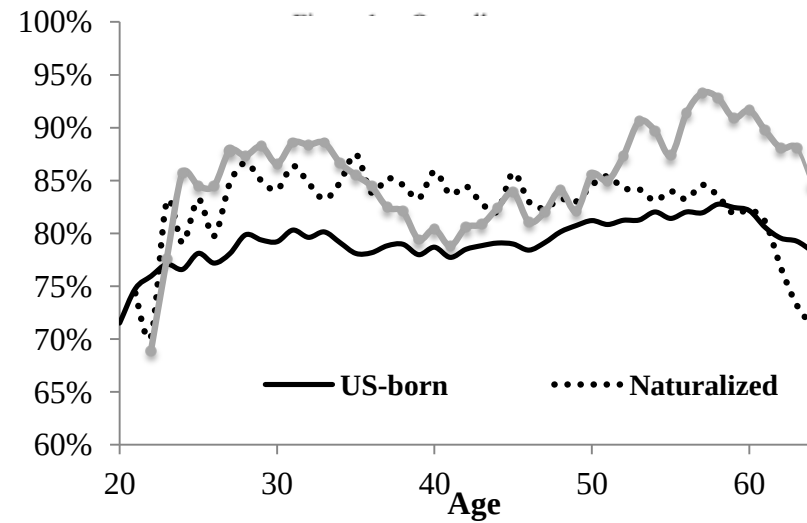
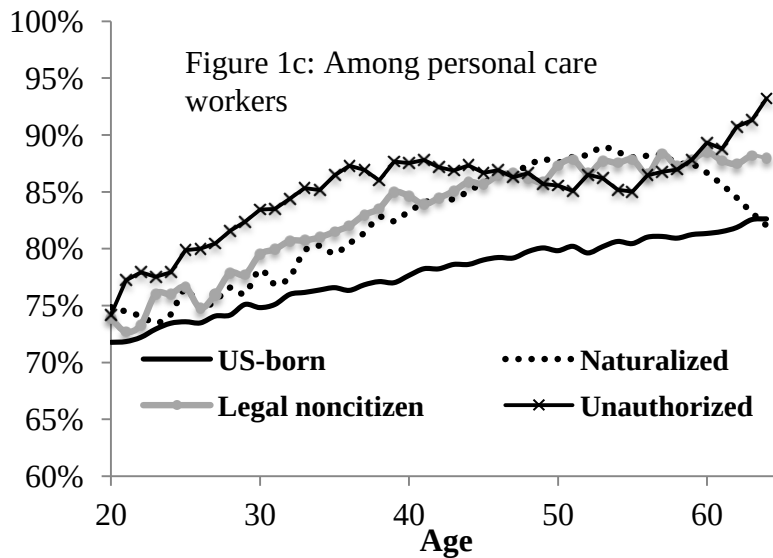


Figure 1c: Among personal care
workers



Note: The predicted age-leaving risks profiles are obtained from a logit regression that also controls for year dummies. We compute the average marginal effect of immigration status on the probability of staying into the LTC workforce. Age is controlled for as fourth-order polynomial. Source: authors' calculations from ASEC-CPS 2003-2019 data.

8. Tables

Table 1: Industry and occupation codes for LTC workforce (OECD's definition)

Code	Years	Census label	OECD's classification
8170	2003-2017	Home health care services	Home-based
9290	2003-2017	Private home health services	Home-based
8270	2003-2017	Nursing care facilities	Institution-based
8290	2003-2017	Residential Care Facility without nursing	Institution-based
3130	2003-2010	Registered nurse	Nurses
3255	2011-2017	Registered nurses	Nurses
3258	2011-2017	Nurse Practitioners	Nurses
3500	2003-2017	Licensed practical and licensed vocational nurses	Nurses
3600	2003-2017	Nursing, psychiatric, and home health aides	Personal care worker
4610	2003-2017	Personal and home care aides	Personal care worker

Note: Code 3130 includes nurse practitioners. After 2014, the census code 3258 includes nurse midwives.

Table 2: Description of immigration status in the LTC workforce

	US-born citizens	All immigrants	Naturalized citizens	Legal noncitizen immigrants	Unauthorized immigrants
Not in LTC workforce	1,573,492 81.27%	362,522 18.73%	134,434 6.94%	108,648 5.61%	119,440 6.17%
In LTC workforce	18,432 77.50%	5,352 22.50%	2,449 10.30%	1,701 7.15%	1,202 5.05%
Total	1,591,924 81.23%	367,874 18.77%	136,883 6.98%	110,349 5.63%	120,642 6.16%

Notes: ASEC-CPS weights are applied.

Table 3: Descriptive statistics of the sample

Variables	All		Long-term care nurses		Personal care workers	
	Mean	SD	Mean	SD	Mean	SD
LTC workforce stayer	0.797	0.403	0.807	0.395	0.793	0.405
Personal care worker	0.594	0.491				
LTC Nurse	0.202	0.402				
US-born	0.766	0.423	0.828	0.378	0.746	0.435
Immigrant	0.234	0.423	0.172	0.378	0.254	0.435
Naturalized citizen	0.116	0.32	0.101	0.302	0.121	0.326
Legal noncitizen	0.067	0.25	0.069	0.254	0.066	0.248
Unauthorized	0.051	0.22	0	0	0.067	0.25
Less than high school diploma	0.116	0.32	0.005	0.073	0.153	0.36
High school graduate	0.335	0.472	0.106	0.308	0.411	0.492
Has some college	0.406	0.491	0.564	0.496	0.353	0.478
Bachelor degree +	0.144	0.351	0.324	0.468	0.084	0.277
Black	0.317	0.465	0.213	0.409	0.352	0.478
Other ethnicity	0.084	0.277	0.085	0.279	0.084	0.277
Age	41.767	12.198	43.746	11.02	41.106	12.498
Male	0.09	0.286	0.076	0.265	0.095	0.293
Excellent health	0.225	0.418	0.257	0.437	0.215	0.411
Very good health	0.342	0.474	0.393	0.488	0.325	0.468
Good health	0.322	0.467	0.283	0.451	0.335	0.472
Fair health	0.095	0.293	0.059	0.237	0.107	0.309
Poor health	0.016	0.126	0.008	0.088	0.019	0.136
Number of observations	22,005		5,474		16,531	

Notes: ASEC-CPS weights are applied. SD: standard deviation. Means are interpreted as percentages for categorical variable

Table 4: Probability of staying into the LTC workforce over a 1-year period

	All		LTC nurses		Personal care workers	
	(1)	(2)	(1)	(2)	(1)	(2)
Immigrant	0.076*** (0.010)		0.048** (0.023)		0.087*** (0.011)	
Naturalized citizen		0.075*** (0.012)		0.058** (0.027)		0.083*** (0.014)
Legal noncitizen		0.080*** (0.015)		0.071** (0.032)		0.085*** (0.017)
Unauthorized		0.076*** (0.016)				0.097*** (0.017)
High school	0.018 (0.012)	0.018 (0.012)	0.073 (0.075)	0.072 (0.075)	0.019 (0.012)	0.019 (0.012)
College	0.005 (0.011)	0.006 (0.011)	0.120* (0.073)	0.120 (0.073)	-0.013 (0.012)	-0.013 (0.012)
>Bachelor's degree	-0.034** (0.013)	-0.033** (0.013)	0.073 (0.073)	0.072 (0.073)	-0.062*** (0.016)	-0.062*** (0.016)
Male	-0.009 (0.011)	-0.009 (0.011)	0.018 (0.027)	0.016 (0.027)	-0.011 (0.013)	-0.011 (0.013)
Black	0.010 (0.008)	0.010 (0.008)	0.012 (0.018)	0.009 (0.018)	0.016* (0.009)	0.016* (0.009)
Other non-White	-0.031** (0.012)	-0.032** (0.013)	-0.023 (0.027)	-0.030 (0.027)	-0.033** (0.014)	-0.032** (0.014)
Age 25-29	0.042*** (0.014)	0.042*** (0.014)	-0.007 (0.049)	-0.009 (0.049)	0.039*** (0.014)	0.039*** (0.014)
Age 30-34	0.045*** (0.014)	0.045*** (0.014)	-0.002 (0.048)	-0.002 (0.048)	0.036** (0.015)	0.036** (0.015)
Age 35-39	0.054*** (0.014)	0.054*** (0.014)	0.004 (0.048)	0.003 (0.047)	0.044*** (0.015)	0.044*** (0.015)
Age 40-44	0.049*** (0.014)	0.049*** (0.014)	-0.027 (0.047)	-0.029 (0.047)	0.049*** (0.015)	0.049*** (0.015)
Age 45-49	0.083*** (0.014)	0.083*** (0.014)	-0.010 (0.047)	-0.011 (0.047)	0.091*** (0.015)	0.092*** (0.015)
Age 50-54	0.097*** (0.014)	0.097*** (0.014)	0.015 (0.048)	0.014 (0.047)	0.100*** (0.016)	0.100*** (0.016)
Age 55-59	0.090*** (0.015)	0.089*** (0.015)	0.046 (0.049)	0.045 (0.048)	0.076*** (0.016)	0.076*** (0.016)
Age 60-64	0.092*** (0.016)	0.092*** (0.016)	-0.017 (0.051)	-0.018 (0.050)	0.106*** (0.019)	0.106*** (0.019)
Observations	22005	22005	5474	5474	16531	16531

Note: * p<0.10, ** p<0.05, *** p<0.01. Results from logit regressions ran on LTC workforce participants in prior year (respectively LTC workers, nurses and personal care workers). Average marginal effects are reported. Robust standard errors are in parenthesis. All models also control for state-level fixed effects, year dummies, urban vs. rural status. ASEC-CPS weights were applied.

Table 5: Probability of reporting a good/excellent health (vs. fair or poor)

	All		LTC nurses		Personal care workers	
	(1)	(2)	(1)	(2)	(1)	(2)
Immigrant	0.015** (0.007)		-0.004 (0.012)		0.026*** (0.008)	
Naturalized citizens citizen		0.014 (0.009)		-0.006 (0.015)		0.023** (0.011)
Legal noncitizen immigrants		-0.003 (0.010)		-0.004 (0.017)		-0.000 (0.012)
Unauthorized immigrants		0.044*** (0.014)				0.060*** (0.016)
High school	0.034*** (0.007)	0.034*** (0.007)	0.041 (0.035)	0.041 (0.035)	0.037*** (0.008)	0.036*** (0.008)
College	0.062*** (0.007)	0.063*** (0.007)	0.063* (0.034)	0.063* (0.034)	0.050*** (0.009)	0.050*** (0.009)
>Bachelor's degree	0.096*** (0.010)	0.097*** (0.010)	0.087** (0.035)	0.087** (0.035)	0.065*** (0.014)	0.064*** (0.014)
Male	0.014 (0.010)	0.013 (0.010)	0.029 (0.018)	0.029 (0.018)	0.015 (0.012)	0.014 (0.012)
Black	-0.012** (0.006)	-0.012** (0.006)	-0.007 (0.010)	-0.007 (0.010)	-0.005 (0.007)	-0.006 (0.007)
Other non-White	0.000 (0.010)	0.001 (0.010)	-0.005 (0.016)	-0.004 (0.016)	0.006 (0.012)	0.006 (0.012)
Age 25-29	-0.051*** (0.015)	-0.050*** (0.015)	-0.054 (0.046)	-0.054 (0.046)	-0.061*** (0.017)	-0.061*** (0.017)
Age 30-34	-0.057*** (0.014)	-0.057*** (0.014)	-0.048 (0.045)	-0.048 (0.045)	-0.076*** (0.017)	-0.076*** (0.017)
Age 35-39	-0.059*** (0.014)	-0.059*** (0.014)	-0.068 (0.044)	-0.068 (0.044)	-0.076*** (0.016)	-0.075*** (0.016)
Age 40-44	-0.080*** (0.014)	-0.079*** (0.014)	-0.092** (0.044)	-0.092** (0.044)	-0.093*** (0.016)	-0.092*** (0.016)
Age 45-49	-0.102*** (0.014)	-0.101*** (0.014)	-0.079* (0.044)	-0.079* (0.044)	-0.128*** (0.016)	-0.127*** (0.016)
Age 50-54	-0.117*** (0.014)	-0.117*** (0.014)	-0.108** (0.044)	-0.108** (0.044)	-0.138*** (0.016)	-0.137*** (0.016)
Age 55-59	-0.132*** (0.014)	-0.131*** (0.014)	-0.120*** (0.044)	-0.120*** (0.044)	-0.153*** (0.016)	-0.153*** (0.016)
Age 60-64	-0.147*** (0.014)	-0.146*** (0.014)	-0.125*** (0.045)	-0.124*** (0.045)	-0.169*** (0.017)	-0.169*** (0.017)
Observations	22005	22005	5440	5440	16531	16531

Note: * p<0.10, ** p<0.05, *** p<0.01. Results from logit regressions ran on LTC workforce participants in prior year (respectively LTC workers, nurses and personal care workers). Average marginal effects are reported. Robust standard errors are in parenthesis. All models control for state-level fixed effects, year dummies, urban vs. rural status. For models on LTC nurses, 34 observations were not used because the variable controlling for Oregon residency predicted the outcome perfectly. ASEC-CPS weights were applied.

Table 6: Association between wage variations, retention and probability of working full-time

Variables	Probability of staying			Probability of working full-time		
	All	LTC nurses	Personal Care workers	All	LTC nurses	Personal Care workers
US-born citizens	0.153*** (0.022)	0.096*** (0.023)	0.167*** (0.022)	0.019 (0.023)	0.097** (0.036)	-0.036 (0.025)
Naturalized citizens	0.096*** (0.033)	0.006 (0.059)	0.094** (0.043)	-0.057 (0.046)	0.093 (0.068)	0.013 (0.065)
Legal noncitizen immigrants	0.163*** (0.05)	0.048 (0.063)	0.183*** (0.049)	0.130** (0.055)	0.107 (0.112)	0.115 (0.086)
Unauthorized immigrants	0.150* (0.076)		0.140** (0.06)	0.186*** (0.065)		0.153** (0.065)
R-squared	0.195	0.138	0.188	0.191	0.019	0.16
Observations	2152	946	2056	2178	985	2099

Notes: * p<0.10, ** p<0.05, *** p<0.01, standard errors reported in parentheses, clustered at the education-age group level. These estimates follow Borjas (2017)'s methodology. Unit of analysis in regression is an age-education-nativity-year cell. Regressions control for age fixed-effects, education fixed-effects, nativity fixed-effects, year fixed-effects, and age-year, education-year, nativity-year, and age-education-nativity-year fixed effects. ASEC-CPS weights are applied.

9. Appendix A. Complementary analyses

Table A1: Policy scenarios and their potential association with retention rates among LTC workers (overall)

	Estimated retention rate variation (%)		Estimated additional LTC workers retained in 2019		Estimated LTC workforce size in 2019	
	Prediction (N)	95% CI*	Prediction (N)	95% CI*	Prediction (N)	95% CI*
Public policy scenarios						
<i>Policy 1: 10% increase in immigrants</i>						
-4% impact on wages (<i>worst case scenario</i>)	-0.63%	(-0.37%; -0.89%)	-8033	(-4716; -11424)	1264966	(1268283; 1261575)
-3% impact on wages	-0.44%	(-0.24%; -0.64%)	-5629	(-3149; -8180)	1267370	(1269850; 1264819)
-2% impact on wages	-0.25%	(-0.12%; -0.39%)	-3224	(-1583; -4937)	1269775	(1271416; 1261575)
-1% impact on wages	-0.06%	(0.00%; -0.13%)	-819	(-16; -1694)	1272180	(1272983; 1261575)
0% impact on wages (<i>best case scenario</i>)	+0.12%	-	1586	-	1274585	
<i>Policy 2: +10% increase in hourly wages</i>	+1.90%	(+1.25%; +2.55%)	+24201	(+15885; +32517)	1297200	(+1288884; +1305516)
<i>Policy 3: legalization of 10% of the unauthorized immigrant workers</i>	0.03%	-	369	-	1273368	

Notes: * 95% confidence intervals. Uncertainties in estimations relate to wage elasticity, which are shown in Table 6. Baseline scenario: no policy intervention.

Total LTC work force size in 2018 (nurses and personal care workers): 1,322,998. Total LTC work force size in 2019: 1,272,999.

Source: Authors' analysis of the ASEC-CPS data (calculations available upon request).

Table A2: Policy scenarios and their potential association with retention rates among LTC nurses

	Estimated retention rate variation (%)		Estimated additional LTC workers retained in 2019		Estimated LTC workforce size in 2019	
	Prediction (N)	95% CI*	Prediction (N)	95% CI*	Prediction (N)	95% CI*
Public policy scenarios						
<i>Policy 1: 10% increase in immigrants</i>						
-4% impact on wages (<i>worst case scenario</i>)	-0.51%	(-0.23%; -0.80%)	-1757	(-785; -2731)	340242	(341214; 339268)
-3% impact on wages	-0.40%	(-0.18%; -0.61%)	-1358	(-628; -2088)	340641	(341371; 339911)
-2% impact on wages	-0.28%	(-0.14%; -0.42%)	-958	(-471; -1444)	341041	(341528; 339268)
-1% impact on wages	-0.16%	(0.09%; -0.23%)	-558	(-314; -801)	341441	(341685; 339268)
0% impact on wages (<i>best case scenario</i>)	-0.05%	-	-158	-	341841	
<i>Policy 2: +10% increase in hourly wages</i>	+1.17%	(+0.47%; +1.87%)	+4016	(+1619; +6413)	346015	(+343618; +348412)
<i>Policy 3: legalization of 10% of the unauthorized immigrant workers</i>	-	-	-	-	-	-

Notes: * 95% confidence intervals. Uncertainties in estimations relate to wage elasticity. which are shown in Table 6. Baseline scenario: no policy intervention.

Nurse LTC work force size in 2018: 322,084. Nurse LTC work force size in 2019: 341,999.

Source: Authors' analysis of the ASEC-CPS data (calculations available upon request).

Table A3: Policy scenarios and their potential association with retention rates among personal care workers

	Estimated retention rate variation (%)		Estimated additional personal care workers retained in 2019		Estimated personal care workforce size in 2019	
	Prediction (%)	95% CI*	Prediction (N)	95% CI*	Prediction (N)	95% CI*
Public policy scenarios						
<i>Policy 1: 10% increase in immigrants</i>						
-4% impact on wages (<i>worst case scenario</i>)	-0.58%	(-0.36%; -0.80%)	-5400	(-3325; -7475)	925598	(927673; 923523)
-3% impact on wages	-0.38%	(-0.21%; -0.54%)	-3515	(-1959; -5071)	927483	(929039; 925927)
-2% impact on wages	-0.17%	(-0.06%; -0.29%)	-1629	(-592; -2667)	929369	(930406; 923523)
-1% impact on wages	0.03%	(0.08%; -0.03%)	257	(776; -263)	931255	(931774; 923523)
0% impact on wages (<i>best case scenario</i>)	+0.23%	-	+2142	-	933140	
<i>Policy 2: +10% increase in hourly wages</i>	+2.04%	(+1.48%; +2.60%)	+19006	(+13800; +24212)	950004	(+944798; +955210)
<i>Policy 3: legalization of 10% of the unauthorized immigrant workers</i>	0.02%	-	141	-	931139	

Notes: * 95% confidence intervals. Uncertainties in estimations relate to wage elasticity, which are shown in Table 6. Baseline scenario: no policy intervention.

Personal care work force size in 2018: 1,000,998. Total LTC work force size in 2019: 930,998.

Source: Authors' analysis of the ASEC-CPS data (calculations available upon request).