IMMIGRATION, THE LONG-TERM CARE WORKFORCE, AND ELDER OUTCOMES IN THE US

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ABSTRACT

The US nursing home industry faces severe labor shortages that have worsened following the COVID-19 pandemic. Because nursing homes are highly reliant on immigrant labor, a frequently proposed policy lever to address shortages is to increase national immigration flows. Although debates over immigration remain contentious, existing evidence using geographic-level data indicates that greater immigration increases the supply of nurses and nurse aides with some improvements in nursing home quality. This paper extends earlier work using nursing home–level and patient-level data and shift-share analyses to assess the impact of increased immigration on nursing home staffing and care quality. Additionally, we explore heterogeneity in observed treatment effects and potential mechanisms through which changes in patient outcomes occur. In our preferred specifications, we show that increased immigration significantly raises the direct-care staffing ratios of nursing homes, with effects concentrated among full-time workers. We then show that this has a robust and very positive effect on a variety of patient outcomes. Effects were strongest from increases in Hispanic immigrants. We find suggestive evidence that immigrants increase both the supply and the quality of the nursing home workforce, supporting the critical role that immigration may play in addressing long-standing staffing and quality issues in this industry.

KEYWORDS: long-term care, aging, immigration, quality
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I. Introduction

One of the most contentious topics of debate in the US over the past decade has been immigration. Critics of US immigration policy have highlighted the prospect that increased

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immigration leads to lower wages for natives, more use of welfare, and higher crime rates.[1] Supporters of existing, and even expanded, immigration have highlighted the lack of empirical evidence supporting the claims of critics—and the enormous benefits to our economy in the past from immigration.[2] Public opinion on this issue is mixed, with roughly even shares of Americans believing in 2021 that immigration should be increased, kept at its present level, and decreased. Over 60 percent of Americans are either somewhat or very dissatisfied with present levels of immigration, but they disagree on whether it is too low or too high.[3]

Immigrants are relatively concentrated in a specific set of occupational groups in the US.[4] For many immigrant groups, long-term care services, including both nursing homes and home care, represent a disproportionate share of employment. Of individuals who were not born in the US, 1.7 percent work in the home care or nursing home care industries; the majority these are direct-care workers, making up 25 percent and 19 percent of direct-care workers in these industries, respectively.[5]

The impact of immigration on the market for nursing home workers is particularly notable because this is a labor market with persistent excess demand. Over half of nursing homes are not compliant with the Centers for Medicare and Medicaid Services (CMS) expected daily staffing levels more than 80 percent of the time (Geng et al. 2019). This understaffing is not surprising given a combination of relatively weak regulation of nursing home staffing ratios and low reimbursement of nursing homes by their primary payer, state Medicaid programs.

The nursing home sector has been especially hard-hit by recent labor shortages in the United States amid the COVID-19 pandemic (McGarry et al. 2020). Since early 2020, the number of people working at nursing homes has fallen by almost 7.5 percent, and staff departures worsened after facilities experienced COVID outbreaks (US Bureau of Labor Statistics 2023; Shen et al. 2022). Staffing shortages have been so severe that they are believed to have forced nursing homes to reduce the number of beds in operation and restrict new admissions (American Health Care Association 2022a).

With excess demand at constrained wages, the supply of nursing home workers becomes a key determinant of staffing levels. As such, immigration flows can have a direct and important effect on the staffing of nursing homes. Moreover, evidence from the Netherlands

1 For example, then-candidate Donald Trump pointed to all three in a speech in August 2016 focused on immigration (*New York Times* 2016).

2 See op-eds for the Cato Institute by Alex Nowrasteh (2018) or for Vox by Matthew Yglesias (2019).

3 Results from Gallup's long-term tracker of American attitudes toward immigration (https://news.gallup.com/poll/1660/immigration.aspx).

4 Pew Research Center (Desilver 2019) estimates that in 2014, farming, fishing, and forestry had the highest immigrant share (46 percent), followed by building/grounds cleaning and maintenance (35 percent). Health-care support is 20 percent immigrant, the ninth highest share.

5 Calculations for the population aged 16 and over are from the 2007–18 American Community Survey (ACS), based on having either the nursing home or the home health-care industry code. Direct-care workers are defined here as registered nurses (RNs), licensed practical nurses (LPNs), and certified nursing assistants (CNAs) in the nursing home industry or as RNs, LPNs, CNAs, home health aides, and personal care aides in the home health-care industry.

suggests that policies that match refugees or other lower-skilled immigrants with occupations with labor shortages can alleviate these issues, with limited negative effects on native workers (Foged et al. 2022).

It is unclear, however, how additional immigrant supply of long-term care workers will impact the quality of care for nursing home residents. On the one hand, to the extent that immigrant workers increase staffing levels at nursing homes, this may increase quality as past work has demonstrated quality gains with improved staff-to-resident ratios (Chen and Grabowski 2015). On the other hand, an increased supply of unskilled immigrants may displace native workers who may have more positive impacts on care quality owing to a lack of language barriers. More immigrants in this sector could also displace higher-skilled nurses if facilities substitute lower-skilled certified nursing assistants (CNAs) for higher-skilled registered nurses (RNs) and licensed practical nurses (LPNs).

In this paper, we investigate the impact of immigration on nursing home staffing ratios and skill mix and the quality of care of older residents. To do so we match data on immigrant flows by local area and year with facility-level data on nursing home staffing and patient-level data on health outcomes. We look at the supply and wages of both low-skilled and higher-skilled jobs at nursing homes, and on the quality of care as measured by several indicators such as incidence of adverse events reported by nursing homes on mandatory resident assessments and medical-claims-based measures of hospitalizations and mortality.

Of course, it is possible that immigrant flows into an area can be correlated with unobserved determinants of nursing home labor supply. To address this problem, we follow Card (2001) in creating an instrument for immigrant flows to the area based on the existing distribution of immigrant ethnicities across US cities and the national inflow of immigrants from that nationality. We update this instrument by focusing on national immigrant flows among groups who are most likely to work in the nursing home industry. Specifically, we focus on female immigrant flows as most direct-care workers are women, and we weight our estimates by each ethnic group's historical propensity to work as a direct-care provider in a nursing home.

In our preferred empirical specifications, we find that an increase in the supply of immigrants to a community has a strong positive effect on the supply of both lower-skilled (CNA) and higher-skilled (RN) hours provided to nursing home residents. We estimate that for every 10 percent increase in female immigration, there are 0.7 percent more CNA hours per nursing home resident and 1.1 percent more RN hours per resident. We find that the impact on CNA supply is almost exclusively in full-time positions, which may be correlated with higher quality than part-time staff (Castle and Anderson 2011); for RNs, there is a larger relative rise in part-time hours.

Across all our specifications, we find consistent evidence that increased immigration leads to improved patient care, both for those who are in the nursing homes for short, rehabilitative, stays and for those with long stays focused on meeting personal care needs. In our preferred specification, we find that both short- and long-term quality rises by roughly 0.01 standard deviations per 10 percent increase in female immigrants as measured by a normalized composite quality score of nursing home–reported health outcomes. We also find a decline in hospitalizations in the short term of 0.6 percent per 10 percent increase in female immigrants and an increase in the likelihood of a successful community discharge

for new admissions of 1.1 percent per 10 percent increase. In our preferred models, we do not find any significant impact on patient mortality, nor do we find clear differences across patient types. We do find evidence suggesting that immigrants from Hispanic countries have both the largest staffing effects and the largest positive effects on quality. Collectively, these results suggest that immigrants increase the quality of care of older adults residing in nursing homes, likely because of increases in both the staffing levels and the quality of the nursing home workforce.

Our paper proceeds as follows. In Section II, we discuss the institutional setting of our study and the economics of nursing home staffing, as well as review the existing literature on the impacts of immigration and how it informs our analysis. Section III provides a conceptual framework that guides our study design choices. Section IV discusses our data sources and empirical strategy, Section V presents our results, and Section VI concludes.

II. Background

A. NURSING HOME STAFFING ECONOMICS

There are over 15,000 nursing homes in the US, 70 percent of which are for-profit (National Center for Health Statistics 2019). Roughly 50 percent of nursing home revenues come from Medicaid, a state program that is jointly financed with the federal government (National Investment Center for Seniors' Housing and Care 2020). Individuals are entitled to nursing home care under Medicaid if they are sufficiently disabled and have income and assets below the state-established thresholds, but states have considerable flexibility in determining reimbursement rates for facilities. States generally pay a daily baseline rate, called a per diem, and often add adjustments based on resident acuity and care quality (Medicaid and CHIP Payment and Access Commission 2019). Moreover, residents who initially have income or asset levels above Medicaid eligibility are allowed to spend down their assets, with Medicaid paying for care once the person is eligible.

Meanwhile, 20 percent of nursing home revenues come from the traditional federal Medicare program, which pays, at most, for the first 100 days of costs for eligible nursing home stays (typically for patients recovering from injury or surgery).[6] Another 10 percent of revenue comes from Medicare Advantage plans. The remaining 20 percent of nursing home revenues come from private pay patients and other sources such as community programs and veterans' benefits.

These varying revenue streams highlight an important fact regarding whom nursing homes serve. Most facilities provide care to two distinct resident populations. On any given day, most beds will be occupied by long-stay residents. These individuals primarily receive personal care services (i.e., help with activities of daily living including bathing, dressing, eating, and mobility) and 24-hour supervision, and they usually reside in the nursing home

6 To be eligible for Traditional Medicare coverage, a nursing home stay must be preceded by a three-day hospital stay and there must be a documented need for daily skilled services that are deemed medically necessary to treat a condition that was treated during the preceding hospital stay or that arose during a nursing home stay.

for the remainder of their lives. As mentioned previously, Medicaid is the primary payer for these stays.

On the other hand, about 13 percent of nursing home residents on a given day are Medicare-covered short-stay patients (Kaiser Family Foundation 2022). These individuals are required to receive skilled care (i.e., medical care and therapy from nurses and physical, occupational, and speech therapists) in addition to personal care services. Stays last 28 days on average, and nearly half of these patients are discharged back to the community once they have sufficiently recovered from injury or surgery (National Academies of Sciences, Engineering, and Medicine 2022; Medicare Payment Advisory Commission 2021). Little empirical work has examined the staffing needs of these two different populations, but CMS has determined that these groups are sufficiently distinct to warrant separate sets of outcome measures to monitor quality.[7] As such, it is likely that short- and long-stay residents may benefit differentially from changes in staffing levels and skill mix.

Direct care (including labor and supplies) accounts for roughly two-thirds of the costs for nursing homes, and about half of these costs go toward paying CNAs, LPNs, and RNs (Center for Health Information and Analysis 2019; Bowblis and Applebaum 2022). CNAs, who interact with patients frequently to monitor health and assist patients with activities of daily living, such as feeding, bathing, toileting, and mobility, constitute the largest expenditure within this group. CNA positions are typically held by less formally educated employees; only 9 percent of CNAs have a four-year college degree, with an even lower share (5 percent) for CNAs working in nursing homes.[8] CNA training is minimal, with a federal standard of 75 hours of training. In 2016, 30 states set higher standards, the highest being Maine at 180 hours, but only 6 states required more than 120 hours (Paraprofessional Healthcare Institute 2016). CNAs are also typically paid close to minimum wage; the median hourly wage for CNAs in the US is just under $15 per hour (US Bureau of Labor Statistics 2021). This low pay, coupled with very limited benefits, in part explains why the industry suffers very high rates of employee turnover—national estimates indicate over 110 percent turnover on an annual basis for CNAs (Gandhi et al. 2021).

Nursing homes also employ more skilled labor, in the form of licensed practical nurses (LPNs) and registered nurses (RNs). LPNs have much more training than CNAs, typically requiring a year or more of formal training after high school. They perform basic medical care such as monitoring and recording vital signs, administering medications, and helping with activities of daily living. RNs, meanwhile, typically have a four-year college degree.[9] RNs carry out more advanced tasks such as performing patient assessments and overseeing the care provided by LPNs and CNAs. The typical nursing home has a ratio of 2.7 CNA hours to 1 LPN hour and 4 CNA hours to 1 RN hour.[10]

7 See the CMS quality measures webpage: https://www.cms.gov/medicare/quality/nursing-home-improvement/quality-measures.

8 Calculations made using the 2007–18 ACS, identifying CNAs through their occupation code and those working in nursing homes through the industry code.

9 In the 2007–18 ACS, 58 percent of RNs have a college degree or more.

10 Based on daily staffing levels reported in the 2017–19 Payroll-Based Journal staffing data (https://data.cms.gov/quality-of-care/payroll-based-journal-daily-nurse-staffing).

The nursing home industry has suffered from chronic understaffing. One early federally commissioned study concluded that staff to resident ratios of around 4.1 hours per resident day (HPRD) are needed to ensure high-quality resident care (Kramer et al. 2000; Institute of Medicine et al. 2001). We estimate that in 2019, the median staffing level in US nursing homes was 3.7 HPRD and that just 29 percent of nursing homes met the recommended staffing ratios. Bringing all US nursing homes to this target would require an additional 93,000 direct-care workers, an increase of 13 percent relative to actual staffing levels in 2019.[11] The COVID pandemic worsened this shortfall, as the difficult working conditions in nursing homes were made significantly riskier—as of May 2023 over 3,100 nursing home staff had died of COVID-19.[12] Nursing homes also report consistent excess demand for CNAs. For instance, following a 2018 California law that increased the minimum staffing ratios for nursing homes, more than half of facilities applied for a waiver because of an inability to fill open CNA positions (Ostrov 2018). Similarly, the nursing home industry has strongly pushed back against a forthcoming federal minimum staffing regulation by citing an inability to hire new workers.[13]

B. IMMIGRANT LABOR IN NURSING HOMES

Immigrants are a key component of the direct-care workforce in nursing homes—comprising roughly 19 percent of CNAs, 16 percent of LPNs, and 20 percent of RNs in nursing homes.[14] This labor supply includes both documented and undocumented individuals. Using data from the Annual Social and Economic Supplement of the 2018 Current Population Survey, Zallman et al. (2019) estimate that 24 percent of the direct-care workforce in nursing homes were immigrants, with about 15 percent being naturalized citizens, 6 percent being legal noncitizens, and about 4 percent being undocumented. CNA positions may be attractive employment options for newly immigrated individuals for several reasons. In order to attract employees, many nursing homes offer to cover the costs of the required CNA training for new hires, thereby creating an opportunity to obtain a recognized health-care certification at little or no cost.[15] Furthermore, new hires may also be able to get paid while completing the clinical portion of their training, and because of the persistent excess demand for labor in this setting, facilities often offer sign-on and retention bonuses.

11 Using Q1 2019 Payroll-Based Journal data (https://data.cms.gov/quality-of-care/payroll-based-journal-daily-nurse-staffing), we determined the average hours of direct care per resident day for all nursing homes and subtracted this average from the target 4.1. We retained shortages (i.e., values >0) and converted the HPRD shortage to an hours per day shortage by multiplying by facilities' average daily census. Hours per day was then converted to an employee shortage by dividing by 7 (i.e., a typical full-time shift). This estimate likely underestimates the actual worker shortage because of the frequent use of part-time staff in this industry.

12 See COVID-19 Nursing Home Data from CMS.

13 See, for example, the statement by the American Health Care Association (2022b) representing nursing homes.

14 Calculations for the population aged 16 and over are from the 2007–18 ACS.

15 Several example postings with training covered include the following: https://www.friendlyseniorliving.org/friendly-home/careers/cna-program/; https://careers.promedicaseniorcare.org/Nursing-Assistant-Training-Program; and https://visitmaplewood.com/employment/.

Given the educational requirements for becoming an LPN or RN, these positions are not options for new immigrants without prior training. However, foreign-educated nurses who were licensed in another country (to practice as an RN equivalent, for example) can enter the nursing workforce relatively rapidly via a short course and competency exam.[16] Additionally, employment in a nursing home as a nurse may be a mechanism to legally immigrate to the US via EB-3 and H-1B work visas.[17]

C. THE IMPACT OF IMMIGRATION

An enormous body of literature exists on the effect of immigration on labor market outcomes, often reaching different conclusions. Some studies have found small or positive effects on native wages and employment, with negative effects largely on previously arrived immigrants, and little effect on public spending (Card 1990, 2005, 2009; Kugler and Yuksel 2008; Ottaviano and Peri 2008). Other work has estimated reduced employment and wages for low-skilled US-born workers along with increased government spending (Borjas 2003, 2019). Although this literature has focused on the impact of immigration on wages and employment, there has also been research into the implications for consumers, finding that immigration lowers prices in immigrant-intensive sectors (Cortés 2008).

Relatively less research has focused on the impact of immigration for the health-care labor force. Research into the supply of immigrant nurses on local nurse wages did not find consistent statistically significant effects, although the instrument used was somewhat weak (Kaestner and Kaushal 2012).[18] There is also evidence that immigration in the United Kingdom reduced National Health Service waiting times, although this may have occurred because of migration out of immigrant-intensive locations rather than immigrant labor (Giuntella et al. 2016). The 2016 Brexit referendum, meanwhile, was found to reduce the number of European Union nurses working in National Health Service hospitals, resulting in an increase in unplanned hospital readmissions (Castro-Pires et al. 2023). A recent study found that immigration in the late 20th century resulted in a shift from institutional care to home care for the elderly because of the reduced cost of home health aides and other workers, such as gardeners and housekeepers, that are essential to aging at home (Butcher et al. 2021); we investigate this issue as well below.

The current paper is most directly related to recent work by Furtado and Ortega (2026), which also uses a shift-share approach to examine geographic-level measures of nurse (i.e., CNA, LPN, and RN) labor supply and nursing home quality outcomes. Specifically, they focus on instrumented changes in immigration levels over five-year periods at the commuting zone level and find that immigration resulted in large increases in the supply of nurses

16 Additional information on the process can be found at https://nurse.org/articles/work-in-us-as-foreign-educated-nurse/.

17 Information on EB-3 visas is available on the US Citizenship and Immigration Services webpage: https://www.uscis.gov/policy-manual/volume-6-part-e-chapter-7. See US Citizenship and Immigration Services (2015) policy memorandum for information on H-1B visa eligibility.

18 *F*-statistics across specifications range from 4.7 to 14.4 in the first stage when instrumenting the total supply of nurses with the supply of immigrant nurses.

and a rise in the quality of nursing home care. We strengthen the findings of this earlier analysis and broaden them along several key dimensions. In particular, as detailed in the Online Appendix, we are using much higher-quality and newer data on actual nursing home staffing ratios and patient outcomes; we focus on a broader set of outcome measures that are more unambiguous and not strictly reliant on nursing home self-reports, than the falls measure that is the focus of their analysis; and we use micro-data, which (unlike their aggregated data) are not severely censored owing to CMS data-reporting rules. Perhaps most importantly, our use of micro-data allows us to assess the quality effects of immigration on all residents in nursing homes, as well as draw important distinctions between short- and long-stay patients, to examine potential mechanisms through which quality improvements occur, and to examine residents in different racial/ethnic groups, and those with and without certain chronic conditions (e.g., Alzheimer's disease and related dementias). Our confirmation of their findings further strengthens the conclusion that immigrant inflows increase nursing home staffing and improve a broad set of patient outcomes.

III. Conceptual Model

Increases in national immigrant flows may impact nursing home staffing and care quality through several pathways. An influx of new immigrants into a geographic region is likely to increase the immigrant labor supply, and prior evidence suggests that a disproportionate share of these workers will choose to work in nursing homes. Furthermore, immigrants from ethnic groups that have historically been more likely to work in nursing homes may be especially likely to work in this industry. We hypothesize that this increase in immigrant labor supply will increase overall direct-care staffing levels in nursing homes with minimal effects on wages and displacement of native nursing home workers, consistent with anecdotal reports of persistent excess demand for labor in the industry. However, it is possible that increases in immigration could lead to a shift toward using more immigrant workers and fewer native workers (i.e., crowd-out) and a reduction in prevailing wages. Under this scenario, the impact of immigration on total staffing levels is ambigous as the increased use of immigrants could be partially or completely offset by the decline in the employment of native workers. Because there are few barriers to working as a CNA for new immigrants and there are several pathways for foreign-trained nurses to immigrate to the US for the purpose of working in a health-care setting, we expect that much of these staffing effects will occur in the same year. Effects may increase over time as more immigrants meet the requirements needed to work as nursing assistants and nurses in US nursing homes.

Previous research has shown that increases in direct-care staffing levels can improve the quality of nursing home care (Chen and Grabowski 2015; Grabowski 2004; Foster and Lee 2015). As such, we expect increases in immigration to have beneficial effects on resident health outcomes. In addition to increasing the amount of staffing in nursing homes, immigrants may affect the quality of care by changing the composition of staff. For instance, an increase in the supply of CNAs could cause substitution away from nurses, which has previously been linked to reductions in care quality (Mukamel et al. 2024; Lin 2014). Alternatively, immigrant workers may provide a more stable and consistent workforce through pathways like reduced turnover or greater propensity to work in full-time

roles, which prior research would suggest improves care quality (Shen et al. 2023; Zheng et al. 2022; Frogner and Spetz 2015; Castle et al. 2007).

Finally, immigrant effects on care quality may differ across a variety of resident characteristics. For instance, facilities might elect to direct any additional staff hours that result from increases in immigration toward higher-margin short-stay residents to help them better compete on quality for this lucrative patient population (Gandhi 2020). Furthermore, the differing care needs between short- and long-stay residents may also contibute to heterogenous responses to immigration. Short-stayers typically have greater rehabilitative and medical needs, while long-stayers typically have greater personal care needs requiring hands-on support. A priori, it is unclear which patient group would accrue greater benefit from immigration-related staff changes.

Patients with memory-related diseases, including Alzheimer's disease and related dementias (ADRD), may especially benefit from additional staffing as this population requires close supervision and frequent hands-on care to manage behaviors and ensure resident safety without the use of physical or chemical restraints. Furthermore, individuals with ADRD are believed to benefit from consistent and long-lasting staffing assignments to build trust and limit confusion in the presence of memory deficits (Gaugler et al. 2014). Consistent with evidence that the racial and ethnic composition of patient and clinician dyads may influence the quality of care, one might expect the effects of increased immigrant labor to vary by patient demographics (Ye and Yi 2023; Alsan et al. 2019). For instance, a lack of English proficiency could hinder the care delivery by immigrant staff for patients who speak only English, but could improve care for patients who speak the same non-English language.

IV. Data and Empirical Strategy

A. DATA

Data for this study come from several sources.[19] Annual measures of immigrant flows were obtained from the 2000–18 American Community Survey (ACS) micro-level data set.[20] This nationally representative survey, administered by the US Census Bureau to more than one million respondents annually, contains detailed information on a variety of economic and demographic characteristics. Importantly for the present study, the ACS asks respondents for detailed information on their birthplace, their current occupation, and annual wages. The ACS does not ask respondents about their legal status; however, undocumented immigrants are eligible to participate in the ACS and included in its sampling framework.[21] This data source has been widely used in the past to study illegal immigration (Amuedo-Dorantes et al. 2020; Bohn and Pugatch 2015; Pope 2016; Orrenius and Zavodny 2016). As such, measures derived from the ACS should be viewed as encompassing both legal and illegal immigration. Annual immigrant totals and flows are calculated at the level of the state–metropolitan statistical area (MSA), which accounts for the fact that some MSAs

19 See Online Appendix D for a more detailed discussion of the sources and our use of them.

20 Data obtained from IPUMS USA (Ruggles et al. 2022).

21 See US Census Bureau (2021) for more information.

span more than one state. This is the most granular level of data available in the ACS (via the IPUMS USA).

We measure nursing home census and staffing levels using 2006–18 data from the Certification and Survey Provider Enhanced Reports (CASPER; formerly known as OSCAR). CASPER surveys must be completed at least every 15 months as part of facilities' requirements for maintaining Medicare and Medicaid certification. They obtain information on a wide range of facility characteristics including resident census, quality outcomes, and staffing levels for CNAs, LPNs, and RNs during the two weeks prior to the survey date. Staffing hours are reported separately for full- and part-time workers in each job category. Hourly wage data were obtained from the 2006–18 waves of the American Community Survey micro-level data set.

Information about resident health outcomes come from several sources. The Minimum Data Set (MDS) contains information on comprehensive resident assessments that are required to be performed by all Medicare-Medicaid certified nursing homes for all residents. These assessments must be completed 5, 14, 30, 60, and 90 days following nursing home admission, and quarterly thereafter; residents are also assessed at discharge and may be required to have unscheduled assessments because of a change in health or functional status. These assessments cover a broad range of topics including resident physical and mental health status, functional capacities, nutritional needs, and use of select prescription medications. Additionally, Medicare enrollment data from the Master Beneficiary Summary File is used to identify resident deaths, and Medicare inpatient and outpatient claims are used to identify hospitalizations for Medicare-eligible nursing home residents. These various data sources underlie CMS's quality reporting initiative for nursing homes—five-star quality scores reported on the federally produced Care Compare website.[22] Furthermore, they have been widely used to study quality of care provided by nursing homes across hundreds of peer-reviewed journal articles (National Academies of Sciences, Engineering, and Medicine 2022).

B. SAMPLE

Our sample encompasses over 16 million Medicare beneficiaries residing in 13,000 unique nursing homes that are in MSAs. The primary unit of analysis for our empirical work examining quality outcomes and staffing levels is the nursing facility. For each facility, we use data on all residents, but we also separate them into short-stay and long-stay (i.e., in the nursing homes for 90 or more days) patients. Additionally, certain outcomes are not applicable to all residents. These nuances are discussed in greater detail in Section IV.C. For analyses of nursing staff wages, our unit of analysis is the state-MSA.

C. STAFFING OUTCOMES

Nursing home staff hours are reported in CASPER as average weekly full-time employee equivalents (FTEs) over the two weeks preceding the CASPER assessment by job type (CNA, LPN, and RN) and employment status (full vs. part time). We convert FTEs in each

22 https://www.medicare.gov/care-compare/?providerType=NursingHome&redirect=true

facility into a staffing ratio by multiplying the number of FTEs by 5 (35 hours divided by 7 days) to calculate hours per day and then dividing by the number of daily residents, calculated as the average daily occupancy rate multiplied by the number of beds. Annual nursing home census is measured as the total number of residents residing in each facility at the time of its annual CASPER survey.

Previous evaluations of the CASPER data have found reported staffing levels to contain extreme and implausible values. We address this issue by identifying outlier observations and imputing the staffing values for these cases,[23] though we acknowledge that these data may still suffer from measurement error (Geng et al. 2019). Staffing levels are reported overall, as well as separately for full- and part-time workers; when overall staffing is imputed, we impute full- and part-time shares using the same methodology. For computing wages, annual income and weeks worked were obtained from the ACS data for individuals who reported their occupation as CNA, LPN, or RN in the nursing home industry. Weighted annual median hourly wages were calculated at the state-MSA level.

D. QUALITY OUTCOMES

A wide variety of resident outcomes can be measured using the MDS assessment data. In constructing our outcomes of interest, we prioritized validated measures that are used by CMS as part of their five-star quality score, measures that are likely to be impacted by the level and quality of direct care provided by nursing home staff, measures that are less susceptible to self-reporting bias because they could verified through claims or medical records, measures that were consistently available across our study period (which includes the transition from MDS version 2.0 to version 3.0), and measures with a clear normative interpretation. Based on these criteria, we included pressure sores, use of physical restraints, placement of an indwelling catheter, inappropriate use of antipsychotics, feeding tube placement, and urinary tract infection (UTI); a description of these measures and their rationale are detailed in Table 1.[24] We generally follow CMS procedures to construct these outcome measures, with some exceptions. For instance, we measure antipsychotic use, catheter placement, and the development of UTIs for both long- and short-stay residents

23 See the LTCFocus data dictionary for additional information on the validity of CASPER data. https://ltcfocus.org/about. We define outliers as observations where staffing levels for each worker category are (1) above 250 percent or below 40 percent of the facility-specific median across sample years, (2) between 200 percent and 250 percent or 40–50 percent of the median where the prior wave was between 83 percent and 120 percent of the median, or (3) reported as zero hours for CNAs, LPNs, or RNs. We then impute these observations based upon facility census, the closest previous (or subsequent, if the first wave) non-outlier observation for the facility, and several facility-level characteristics including average age of resident, whether the facility has an ADRD special care unit, the payer mix, and for-profit status.

24 Additional MDS-based measures currently included in CMS's five-star rating but not included in our study include (1) measures related to changes in mobility and functional independence and (2) falls that resulted in a major injury. We exclude the former because they are measured using subjective scales that rate the amount of support the patient needs to move/complete activities of daily living and are therefore at increased risk of bias. We exclude the latter because falls are difficult to interpret, since increased mobilization of patients (a marker of better care quality) can also increase the risk of falling. We explore this measure, as well as a claims-based analogue, in the Online Appendix.

TABLE 1. Minimum Data Set (MDS) variable definitions

Measure	Rationale	Sample
New stage 2–4 pressure sore	Pressure ulcers can result from a lack of staff-supported mobility, including being repositioned in bed or getting out of bed or a chair	All nursing home residents with a scheduled MDS assessment, excluding initial MDS assessments
Daily use of physical restraints	Facilities may use physical restraints as a substitute for adequate staff supervision to ensure patient safety	All nursing home residents with a scheduled MDS assessment
Placement of indwelling catheter	Facilities may use indwelling catheters in place of labor-intensive toileting schedules	All nursing home residents with a scheduled MDS assessment
Inappropriate use of antipsychotics	The use of antipsychotic medications without a clear clinical indication can be a form of chemical restrained used to subdue residents and reduce the intensity of staff supervision required for these residents	All nursing home residents with a scheduled MDS assessment without a clinical indication for the use of antipsychotics[1]
Feeding tube placement	Facilities may use placement of a feeding tube as a substitute for labor-intensive manual feedings provided by staff	All nursing home residents with a scheduled MDS assessment
Urinary tract infection (UTI)	Inadequate toileting, resident cleaning, and placement of indwelling catheters can all increase the risk of UTIs	All nursing home residents with a scheduled MDS assessment

Note: [1]Follows Lucas et al. (2014).

rather than just long-stay residents. Additionally, for long-stay residents, we measure the development of pressure sores for all residents, not just those who are deemed to be at high risk for pressure ulcers based on bed mobility, comatose, and malnutrition status. In all cases, these deviations were made to broaden the patient population being studied and avoid conditioning the sample on potentially intermediate outcomes. Because of the large number of assessment outcomes, we focus our analysis on a composite measure, defined as the average of standardized z-scores on all the outcomes listed in Table 1 and referred to as an adverse event composite.

MDS assessments can be both scheduled (and therefore exogenous to resident health status) and unscheduled owing to a change in resident health. To account for the latter endogeneity, we construct the outcome measures using only scheduled MDS assessments. For short-stay residents, scheduled assessments occur in accordance with the Medicare prospective payment system that requires assessments to be competed on days 5, 14, 30, 60, and 90 of skilled nursing facility (SNF) stays. Because 63 percent of Medicare stays end within 30 days, we focus primarily on the 5-, 14-, and 30-day assessments for short

stays and estimate regressions separately for each assessment timing.[25] For long-stay residents, we use quarterly and annual assessments (the latter of which is more comprehensive and replaces the quarterly assessment).[26] To capture the overall quality impacts during a resident's stay, we pool these assessments.

We also examine three claims/enrollment-based outcomes that are not subject to facility self-reports: deaths, hospitalizations, and successful community discharge. Inclusion on these more objective measures is critical as recent work has documented nonsystematic underreporting of adverse events in the MDS data (Chen et al. 2022; Sanghavi and Chen 2023). Resident deaths are identified using the death date included in the Medicare Master Beneficiary Summary File, while hospitalizations are identified using Medicare inpatient claims from MedPAR. Successful community discharges are defined as instances where a newly admitted SNF resident is discharged from the SNF to the community within 100 days of admission and does not have a hospitalization or death within 30 days of the SNF discharge. This measure is constructed using the Medicare enrollment file, MedPAR, and the MDS. It is a marker for a successful course of rehab care and is therefore relevant only for short-stay patients (Abt Associates 2018). Because of a lack of claims data for Medicare Advantage enrollees, hospitalization and successful discharge outcomes are restricted to fee-for-service Medicare beneficiaries.

All of the claims-based measures can be observed without concern about ascertainment bias related to assessment schedules, so we measure them at regular intervals. For short-stay residents, we identify the date of nursing home admission and measure whether outcomes occurred by 5, 14, and 30 days following admission. For long-stay residents, we measure outcomes quarterly (i.e., every 90 days from the date of admission), conditional on being in the nursing home at the start of a given quarter.

One concern with using quality measures based on resident assessments is selective mortality. If immigration impacts mortality, then the surviving residents of nursing homes may be particularly healthy or sick. But in fact, we will show below that there is no impact of our measure on mortality in our preferred specifications in either the short or long run.

Another concern is that immigration-related improvements in quality could affect nursing home length of stay, particularly for short-stay rehabilitative residents for whom the goal of care is to be discharged back into the community. We address this concern by constructing separate analytic samples for each short-stay scheduled assessment (i.e., prospective payment system assessment occurring at 5, 14, and 30 days) that are conditional on being in the nursing home at that time. This type of endogeneity is less of a concern for long-stay residents who are rarely discharged from the nursing home back into the community. As such, we stack all long-stay quarterly assessments into a single analysis sample, controlling for residents' tenure in the nursing home at the time of assessment to account

25 Calculation based on the length of stay between 2008 and 2018 for all MDS residents whose stays are initially covered by Medicare.

26 Scheduled MDS assessments are often coded as change-in-status assessments if a change in health status is identified during the assessment. As a result, we identify assessments that were likely to have been scheduled but were recategorized, defined as cases where a quarterly assessment is missing but there is a nearby (within 20 days of the last assessment + 90 days) quarterly assessment.

for differences in risk as a function of time since admission. This approach leads to a heavier weight on longer-staying patients; our results are similar if we randomly choose one quarter per long-stay patient.

E. EMPIRICAL STRATEGY

Our primary analytic approach is to use year-to-year variation within state-MSAs in immigrant flows to estimate the impact of changes in the immigrant population on the nursing home labor market and nursing home resident health outcomes. That is, we estimate regressions of the following form:

$$Y_{i,h,m,t} = I_{m,t} + X_{i,h,m,t} + \gamma_m + \delta_t + \gamma_m * \lambda_t + \varepsilon_{i,h,j,t} \quad (1),$$

where i indexes individual nursing home residents, h indexes nursing homes, m indexes state-MSAs, and t indexes year. $Y_{i,h,m,t}$ is the quality outcome of interest, $I_{m,t}$ is the stock of immigrants in a given state-MSA-year, $X_{i,h,m,t}$ captures resident characteristics (age, race/ethnicity, dual eligibility for Medicare and Medicaid, gender), γ_m is a state-MSA-level fixed effect, δ_t is a year fixed effect, and $\gamma_m * \lambda_t$ is a state-MSA-specific time trend. We include a unit-specific time trend in our preferred specification because of concerns regarding pre-trends in our outcomes of interest (see Figures B1–B4 in the Online Appendix) and to account for unobserved factors that potentially vary within MSAs over time, such as labor market conditions, growth of Medicare Advantage enrollment, or changes in overall health system quality. However, we also present results for our primary outcomes using models that exclude trends. The term $\varepsilon_{i,h,m,t}$ is a standard error term clustered at the state-MSA level.

We expect that the geographic region in which immigrants chose to locate once arriving in the US is influenced by several labor market conditions that are likely endogenous with our outcomes of interest. For instance, immigrants may elect to move to areas with rising CNA wages resulting from a competitive nursing home market, where facilities also compete on quality to attract new admissions.

To address this selection issue, we instrument for changes in local immigrant population using national immigration flows, because the decision to immigrate to the United States is unlikely to be influenced by local nursing home labor market conditions. We use the shift-share approach developed by Card (2001). Specifically, we use the propensity of certain immigrant groups to settle in certain geographic locations to predict local immigrant flows given the national flow of particular immigrant groups each year.

We extend this approach in several ways. First, because most direct-care workers in nursing homes are women, we restrict our instrument to female immigrant flows.[27] Furthermore, we leverage the fact that certain immigrant groups tend to work as direct-care staff in nursing homes and weight our instrument by this likelihood. Using data from a base period (2000–05), we determine each immigrant group's probability of working as a CNA and use these probabilities to construct weights for each observable immigrant group in our data (Online Appendix Table A1). More specifically, our instrument is

27 True et al. (2020) document the gender mix of direct-care workers.

$$\widehat{I_{m,t}} = \sum_{e} \widehat{I_{m,e,t}} = \sum_{e} (S_{t,e} * I_{m,e,2005}) * W_{e,2005} \quad (2).$$

$\widehat{I_{m,e,t}}$ is the estimated stock of immigrants of ethnicity e in state-MSA m in year t. This value is estimated by determining the national stock of this immigrant group in the same year, relative to the size of the population in our base year of 2005 ($S_{t,e}$). We multiply this ratio by the observed size of the immigrant population of ethnicity e in state-MSA m in 2005, and further weight the estimate by the propensity to work in a nursing home ($W_{e,2005}$). Within each state-MSA, we sum estimated stocks of immigrants of each ethnicity to produce the final instrument.

In our base models, we instrument for the observed stock of immigrants in a state-MSA-year using $\Sigma_e \widehat{I_{m,e,t}}$. Additionally, we scale the instrument by the number of nursing home residents to account for the fact that immigrant flows may alter the number of older adults residing in nursing homes (Butcher et al. 2021). We discuss this issue in more detail in Section V. Models are estimated using two-stage least squares (2SLS), and equations 3 and 4 summarize our approach, with $C_{m,t}$ representing the total number of the nursing home residents in each MSA-year.

$$W_{m,t} = \frac{I_{m,t}}{C_{m,t}} = \frac{\widehat{I_{m,t}}}{C_{m,t}} + X_{i,h,m,t} + \gamma_m + \delta_t + \gamma_m * \lambda_t + \varepsilon_{i,h,m,t} \quad (3).$$

$$Y_{i,h,m,t} = \widehat{W_{m,t}} + X_{i,h,m,t} + \gamma_m + \delta_t + \gamma_m * \lambda_t + \varepsilon_{i,h,m,t} \quad (4).$$

We also construct alternate instruments that stratify immigrants into the following groups: likely to be Black (non-Black) race, likely to be Hispanic (non-Hispanic) ethnicity, likely to be English (non-English) speaking. We calculate likely race, ethnicity, and English-speaking status instruments by measuring the share of immigrants from each birthplace group who were Black, Hispanic, or from countries with English as an official language in the 2005 ACS.[28] We then apply this fraction to the population from each birthplace in subsequent MSA-years before summing the measures to the MSA-level.

The means of our sample, which consisted of 307 MSAs, are shown in Table 2. On average, sample MSAs contained 37 nursing homes and 3,404 nursing home residents. The mean female immigrant population was 65,630, suggesting, on average, 19 female immigrants per nursing home resident.

F. ROBUSTNESS CHECKS

Recent literature has raised concerns about the standard shift-share instrument, particularly in the context of studying the effects of immigration. In particular, Jaeger et al. (2018) demonstrated that in the US, the flow of immigrant groups tends to be highly correlated over time, meaning the instrument is unable to isolate short-run causal effects of a shock of immigrant labor supply from the longer-run effects of such shocks and resulting equilibrium

28 Note that two birthplace variables are used: the general birthplace categories, which group some countries with smaller immigrant populations, and more detailed categories that specify the particular country of birth. The general categories are used for our instrument, while the detailed categories are used to identify immigrants likely to speak English.

TABLE 2. Descriptive statistics of sample state–metropolitan statistical areas (MSAs)

	All years	2008	2018
Number of skilled nursing facilities (SNFs)[1]	37.0	36.4	37.7
Number of SNF residents[1]	3,404	3,469	3,181
Immigrant population	128,160	115,916	141,139
Female immigrant population	65,630	57,997	73,267
Immigrant population instrument	127,832	115,110	141,312
Female immigrant population instrument	65,407	57,520	73,308
Immigrant population instrument (weighted)	138,420	120,170	160,685
Female immigrant population instrument (weighted)	70,548	60,655	82,439
Immigrant population (weighted)	138,002	120,456	159,285
Female immigrant population (weighted)	70,454	60,923	81,867
Immigrants per SNF resident (weighted)	26.0	21.7	32.0
Immigrant instrument per SNF resident (weighted)	23.1	19.9	27.9
Female immigrants per SNF resident (weighted)	13.2	10.8	16.2
Female immigrant instrument per SNF resident (weighted)	11.9	10.1	14.4
Observations (state-MSA-years)	3,650	307	302

Note: Weighted measures are the sum of immigrants from all birthplaces in the MSA, weighted by that birthplace's relative probability of working as a certified nurse aide in a nursing home. Sample of state-MSAs is restricted to 2007–18. Each cell shows the average state-MSA-year value for the corresponding variable. [1]Estimates obtained from LTCFocus data. All other estimates obtained from the American Community Survey.

adjustments. We perform several tests to assess the potential threat of serial correlation in immigrant flows by ethnic group to our model assumptions. Specifically, we examine the year-to-year correlations in the share of immigrant flows coming from each ethnic group identified in our data, and we compare our instrument's ability to predict current year immigrant flows relative to prior years. As discussed in further detail in Section V.A, we find substantially lower between-year correlations in the share of immigrant flows by ethnic group than previous work in this space. Our data and approach offer several advantages that contribute to greater year-to-year variation, including the use of annual (as opposed to decennial) observations, the use of more granular ethnic groups, and the weighting of ethnic groups more likely to work in nursing homes. We also find that our instrument is a much better predictor of current year immigrant flows than prior years. In the presence of strong serial correlation, instrument performance may be expected to be similar when predicting both current and past immigration. In fact, performance may be better for predicting past immigration because these older years are inherently nearer the base period used to construct the instrument. The superior predictive ability of our instrument for its intended purpose (i.e., predicting current year immigrant flows) supports the notion that we have sufficient identifying variation to estimate the effect of immigration on our outcomes of interest.

Additionally, we perform several robustness checks. First, we use earlier base years (i.e., 1990 and 1980 rather than 2005) to determine the geographic distribution of ethnic groups in the US. These more distant base years are expected to be less correlated with the actual, and likely endogenous, annual immigration and settlement patterns occurring during our study window. Robustness to the use of these alternate base years would support the validity of the exclusion restriction for our instrument and further mitigate concerns about serial correlation. Second, we follow Jaeger et al. (2018) and use a multiple instrumentation approach whereby we instrument for both current year and prior year immigrant flows. The use of multiple instruments is intended to directly address concerns about serial correlation by separately estimating the short- and longer-run effects of immigration on our outcomes of interest at the potential cost of introducing weak instrument problems. If our primary specification is indeed robust to serial correlation concerns, we should expect the addition of a lagged instrument to have little effect on our primary estimate of interest. Finally, we address the aforementioned weak instrument concerns inherent to the multiple instrument approach that result from using the same base year to construct the instruments for current and lagged immigration by using different base years (e.g., 2005 and 1990) to construct the two instruments. The use of multiple base years lessens the potential for collinearity between the two instruments. Here again, we should expect to see the addition of a lagged instrument constructed with a more distal base year to have little impact on our main estimate of interest if our main results are not driven by serial correlation. As we detail in Section V.F, our results are robust across all these alternate specifications.

As additional checks of the sensitivity of our results to model and data specifications, we also present results from estimation models that use data only from the more recent, and likely more reliable, MDS 3.0 data set, and analyses where we restrict the sample to the set of nursing homes that are in operation in all years of our data.

V. Results

A. FIRST STAGE

Column 1 of Table 3 and Online Appendix Figure A1 presents first-stage results for our shift-share instrument, scaled as female immigrants per nursing home resident. As discussed in the following section, we find evidence that increases in immigration reduce the size of the nursing home population, so staffing rates best reflect the main outcome of interest. Our estimate indicates a strong link between our instrument and actual immigrant flows. We find that 76 percent of relative female immigrant population increases within an MSA can be attributed to an exogenous supply shock, with an *F*-statistic of 197. Results are similar when we apply alternate weights that account for the propensity to hold any nursing position, as opposed to a CNA role, in a nursing home (not shown). Columns 2 and 3 of Table 3 present first-stage results with different base years being used to construct the instruments. Unsurprisingly, the predictive power of instruments from the most recent base year is roughly twice as large as when we use 1980 or 1990 as the base year.

Figure 1 presents a scatterplot showing the year-to-year correlation in the share of female immigrant flows (weighted by propensity to work in a nursing home) coming from

TABLE 3. First-stage estimates

	Models with state-MSA trends				Models without state-MSA trends			
	Actual female immigrants per SNF resident (weighted)			Lagged actual female immigrants (weighted)	Actual female immigrants per SNF resident (weighted)			Lagged actual female immigrants (weighted)
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Predicted female immigrants per SNF resident (weighted; base 2005)	0.758[a]			0.0705	0.560[a]			0.382[a]
	(0.054)			(0.0775)	(0.0855)			(0.133)
Predicted female immigrants per SNF resident (weighted; base 1980)		0.379[a]				0.249[a]		
		(0.135)				(0.0521)		
Predicted female immigrants per SNF resident (weighted; base 1990)			0.416[a]				0.260[a]	
			(0.113)				(0.0605)	
Observations	3,943	2,739	2,739	3,609	3,943	2,739	2,739	3,609
F-statistic	197	8	14	0.828	43	23	19	8

Note: Instrument measures are constructed with data from 1980 (column 2) and 1990 (column 3) 5 percent census samples and 2000–05 American Community Survey (ACS; columns 1, 4, 5, and 8) for the relative probability weights and baseline immigrant population, and with the 2005–18 ACS for national immigration flows by birthplace. Data on actual immigrant populations are from the 2005–18 ACS. The outcomes in columns 1–3 and 5–7 are the female immigrant populations weighted by the nationality-specific probability of working as a certified nursing assistant in a skilled nursing facility (SNF). In columns 4 and 8, the outcome is the one-year lagged actual population of female immigrants weighted by the propensity to work in a nursing home. Standard errors clustered at the state–metropolitan statistical area (MSA) level are in parentheses. [a]$p < 0.01$.

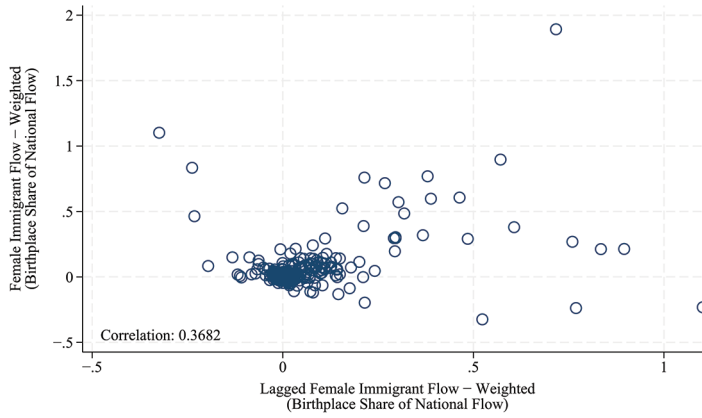

FIGURE 1. Current and lagged female immigrant flows by birthplace. Figure shows the relationship between current year measures of immigrant flows and one-year lagged measures of immigrant flows. The correlation between the two measures is 0.37. American Community Survey data from 2005 to 2018 are used to calculate the annual, national flows of immigrants from each birthplace as well as the total flow of immigrants. The birthplace measures are weighted by each group's propensity to work in a nursing home and are divided by the total national flow each year.

each of the 70 ethnic groups in our data. In contrast to the correlations (0.96–0.99 for years later than 1970) reported when using decennial census data (Jaeger et al. 2018), we find a much lower correlation of 0.37. The use of micro (i.e., annual) data coupled with our focus on female immigrants and the up-weighting of ethnic groups more likely to work in nursing homes appear to substantially reduce concerns of serial correlation in our instrument.

This conclusion is further supported by the results presented in column 4 of Table 3. When our instrument is used to predict lagged immigrant flows, rather than current year, the estimate is close to zero and not significant. The annual identifying variation in national immigrant flows appears to be sufficient to construct an instrument that uniquely predicts current year immigrant inflows within MSAs.

Columns 5 through 8 present the same set of first-stage results and checks when state-MSA trends are excluded from the model. Without controlling for trends, the first-stage relationship is weakened, and the instrument significantly predicts lagged immigrant flows, indicating that concerns about serial correlation are increased in models that do not control for region-specific trends.

B. IMPACTS ON NURSING HOME CENSUS

Online Appendix Table A2 displays the 2SLS estimated relationship between immigration (in levels) and nursing home census. We find that immigration shocks reduce nursing home census—each additional female immigrant results in 0.002 fewer nursing home residents. The average MSA has 66,000 female immigrants, meaning that an annual 10 percent

increase in this population equates to a 0.4 percent reduction in the nursing home population relative to the sample mean. This finding is consistent with the fact that immigrants also often work as home health or personal care aides, professions that allow older adults to remain in their home longer and at greater levels of disability.

The finding is also supported by an earlier study that found that influxes of immigrants between 1980 and 2000 likely reduced the lifetime risk of an older adult becoming institutionalized by 10 percent while increasing the availability and lowering the costs of home services (i.e., home health aides, housekeepers) (Butcher et al. 2021). Our results extend this earlier paper by showing similar results with more recent years of data at a more granular (i.e., annual) level. Furthermore, our findings show that the benefits of additional immigrants extend to older adults who are sufficiently sick and disabled to be nursing home certifiable, meaning that a physician deems nursing home level of care to be medically necessary, but who choose to remain living in the community. Because of this relationship between immigration and the size of the nursing home population, we scale our instrument as the number of immigrants per nursing home resident in all models.

In Online Appendix Table A3, we further examine whether immigration results in favorable selection in who resides in a nursing home according to two claims-based measures of comorbidity—the total number of chronic conditions present at the time of nursing home admissions and whether the residents had a chronic condition count below the sample median at the time of admission. We do not find evidence of significant changes in resident case mix for either of these measures, and the signs of the two were mixed. Specifically, each additional female immigrant per nursing home resident resulted in a 0.02 percent reduction in the mean number of chronic conditions present at admission (consistent with relatively healthier patients entering nursing homes) and a 0.05 percent reduction in the likelihood of having a chronic condition count greater than or equal to the sample median (consistent with increases in patient severity). Collectively, we do not see clear evidence of favorable selection whereby the healthiest marginal patients select out of the nursing home in favor of other (i.e., home-based) care settings that would introduce bias in the same direction of our finding that more immigration improves the outcomes of nursing home residents.

C. IMPACTS ON STAFFING

Table 4 presents the impact of increased immigration on nursing home staffing ratios. Columns 1 through 4 present our preferred specification, which includes controls for region-specific trends. Columns 5 through 8 present results from models that do not control for trends. As discussed in detail in the Online Appendix B, we find evidence of significant trends in the staffing outcomes that precede immigration shocks that may bias model estimates. In addition to reducing serial correlation of our instrument, the inclusion of a state-MSA trend control corrects these pre-trends. As such, we focus our interpretation on columns 1 to 4.

Panel A reports ordinary least squares (OLS) estimates for overall staffing ratios. All coefficients are positive, though the effect on RN staffing is not statistically significant. Though suggestive, these estimates may be biased by the nonrandom allocation of new immigrants across MSAs. Panel B presents results after accounting for this endogeneity with

TABLE 4. Effect of immigration on nursing home staffing: Overall

	Models with state-MSA trends				Models without state-MSA trends			
Variables	CNA hours per resident (1)	LPN hours per resident (2)	RN hours per resident (3)	DC hours per resident (4)	CNA hours per resident (5)	LPN hours per resident (6)	RN hours per resident (7)	DC hours per resident (8)
A. All hours, OLS								
Immigrants per SNF resident (weighted, female)	0.00226[b]	0.00158[b]	0.000336	0.00418[a]	−0.000836	−0.00373[b]	0.00270[a]	−0.00186
	(0.00103)	(0.000695)	(0.000417)	(0.00144)	(0.00156)	(0.00177)	(0.000785)	(0.00277)
Observations	126,901	126,901	126,901	126,901	126,901	126,901	126,901	126,901
Sample mean	2.42	0.87	0.51	3.80	2.42	0.87	0.51	3.80
% change	0.09	0.18	0.07	0.11	−0.0346	−0.427	0.532	−0.0491
B. All hours, 2SLS								
Immigrants per SNF resident (weighted, female)	0.00895[a]	0.00296	0.00282[b]	0.0147[a]	−0.00169	−0.00149	0.00330	0.000111
	(0.00325)	(0.00203)	(0.00113)	(0.00486)	(0.00265)	(0.00333)	(0.00200)	(0.00445)
Observations	126,901	126,901	126,901	126,901	126,901	126,901	126,901	126,901
Sample mean	2.42	0.87	0.51	3.80	2.42	0.87	0.51	3.80
% change	0.37	0.34	0.55	0.39	−0.0701	−0.171	0.648	0.00293

Note: Staffing data are from OSCAR-CASPER 2006–17, while immigration data are from the 2000–18 American Community Survey. We clean certified nursing assistant (CNA), licensed practical nurse (LPN), and registered nurse (RN) staffing data using multiple imputation based on metropolitan statistical area (MSA), year, nursing home census, and past facility-level values. Standard errors clustered at the state-MSA level are in parentheses. These facility-level regressions were weighted by facility bed size. DC: direct care. [a]$p < 0.01$, [b]$p < 0.05$.

our shift-share instrument that predicts MSA-level immigrant stocks per nursing home resident using changes in the national flow of immigrants.

After accounting for the potential endogeneity of immigrant flows using 2SLS, we find substantial effects on CNA staffing—each one-unit increase in female immigrants per nursing home resident (about 3,400 female immigrants) results in an increase of 0.009 CNA hours per resident day, an increase of 0.4 percent relative to the sample mean. Recall that the average MSA has roughly 66,000 female immigrants, as well as 3,400 nursing home residents, meaning that each two-unit increase in female immigrants per nursing home resident is approximately a 10 percent increase in the number of female immigrants. In the context of a 10 percent increase in female immigrants, this would be a 0.7 percent increase in CNA HPRD.

Our instrumental variables results also do not suggest any evidence of crowd-out of more skilled employees; indeed, the rise in LPNs and RNs are comparable to the rise in CNAs in terms of the percentage change relative to the mean. Effects are, however, small in terms of additional staff hours provided. For LPNs and RNs, we estimate an increase of about 0.003 HPRD (although only the RN estimate is significant), or 0.3 hours at the mean facility with 100 residents. In percentage terms, a 10 percent increase in female immigrants would result in a 0.7 percent increase in LPN hours per resident day and a 1.2 percent increase for RNs. Higher nurse staffing stemming from increases in immigration is consistent with nurse immigrants entering the US via work visas sponsored by nursing homes and the fact that LPNs and RNs often supervise CNAs. As such, immigrant-induced increases in CNA staffing may necessitate additional LPN or RN staff hours.

In total, overall direct-care hours per resident day increase 0.015 per unit increase in the female immigrant to nursing home resident ratio, equivalent to an additional 1.5 staff hours per day for the average facility. This equates to a 0.8 percent increase in total direct-care hours per resident day per 10 percent increase in female immigrants and suggests that a 50 percent rise in female immigration could, by itself, offset about 30 percent of the estimated shortfall in nursing home staffing.[29] As a comparison, prior research has indicated that state-level direct-care staffing minimums and wage pass-through laws increased staffing levels by 1–5 percent (Chen and Grabowski 2015; Foster and Lee 2015). These findings extend those of Furtado and Ortega (2026), which showed an increase in the number of nurses and nurse aides in the overall labor force resulting from immigrant shocks, irrespective of industry. Two-stage least squares estimates from models that exclude region-specific trends (columns 5 and 6) were not statistically significant, consistent with the pre-trends observed in Online Appendix Figures B1–B4.

Panels A and B of Table 5 decompose overall staffing effects into full-time and part-time employment, a major concern given the enormous turnover in the CNA workforce. Several studies suggest that higher staff turnover has negative impacts on patient care, and previous work has demonstrated that departing nursing home staff are more likely to be

29 As detailed in footnote 13, we estimate a national daily staffing shortfall of about 93,000 full-time direct-care staff, equivalent to over 650,000 staff hours. We estimate that a 50 percent increase in the female immigrant population would increase direct-care staffing ratios by 0.15 hours per resident day, equivalent to 195,000 staff hours for the 1.3 million residents of US nursing homes (2019 average daily census).

TABLE 5. Effect of immigration on nursing home staffing: Full- and part-time status

	Models with state-MSA trends				Models without state-MSA trends			
Variables	CNA hours per resident (1)	LPN hours per resident (2)	RN hours per resident (3)	DC hours per resident (4)	CNA hours per resident (5)	LPN hours per resident (6)	RN hours per resident (7)	DC hours per resident (8)
A. Full-time hours, 2SLS								
Immigrants per SNF resident (weighted, female)	0.00910[b]	0.00212	0.00170	0.0129[a]	−0.00612[c]	−0.00330	0.00185	−0.00757
	(0.00355)	(0.00164)	(0.00110)	(0.00461)	(0.00363)	(0.00266)	(0.00208)	(0.00558)
Observations	126,901	126,901	126,901	126,901	126,901	126,901	126,901	126,901
Sample mean	1.98	0.72	0.39	3.09	1.98	0.72	0.39	3.09
% change	0.46	0.30	0.44	0.42	−0.309	−0.460	0.473	−0.245
B. Part-time hours, 2SLS								
Immigrants per SNF resident (weighted, female)	−0.000141	0.000848	0.00111[c]	0.00182	0.00443	0.00181	0.00144[a]	0.00768[c]
	(0.00181)	(0.000780)	(0.000671)	(0.00286)	(0.00302)	(0.00127)	(0.000411)	(0.00446)
Observations	126,901	126,901	126,901	126,901	126,901	126,901	126,901	126,901
Sample mean	0.43	0.16	0.12	0.71	0.43	0.16	0.12	0.71
% change	−0.03	0.54	0.95	0.26	1.023	1.153	1.232	1.086

Note: Staffing data are from OSCAR-CASPER 2006–17, while immigration data are from the 2000–18 American Community Survey. We clean certified nursing assistant (CNA), licensed practical nurse (LPN), and registered nurse (RN) staffing data using multiple imputation based on metropolitan statistical area (MSA), year, nursing home census, and past facility-level values. Standard errors clustered at the state-MSA level are in parentheses. These facility-level regressions were weighted by facility bed size. DC: direct care. [a]$p < 0.01$, [b]$p < 0.05$, [c]$p < 0.10$.

part-time workers (Castle et al. 2007; Zheng et al. 2022; Frogner and Spetz 2015). Additionally, full-time staff may be more efficient at delivering resident care. When nursing home workers unionize, a move that typically increases full-time employee hours, total staffing hours were found to decline with no negative effect on resident outcomes (Finnigan and Hale 2018; Sojourner et al. 2012).

We find that our preferred estimate of the effect of higher levels of immigration on CNA staffing is driven entirely by a rise in full-time CNA employment. Each unit increase in the female immigrant rate results in a 0.009 (0.5 percent relative to the mean) increase in the full-time CNA staffing ratio and a nonsignificant −0.03 percent reduction in the part-time CNA staff ratio. This suggests that new workers induced to join the labor force by immigration may prefer or are more willing to accept full-time employment at a single facility as opposed to part-time shift work across multiple nursing homes.[30] On the other hand, for LPNs and RNs, we find comparable impacts on full- and part-time work. The increases in CNA supply are consistent with the high immigrant share of CNAs and the relatively short training period, while the increases in RN staffing ratios are consistent with both the supervisory capacity these nurses fill and the fact that 20 percent of RNs working in nursing homes are immigrants.[31]

Table 6 explores the impact on wages run at the state-MSA level (owing to data availability). Despite a sizable rise in labor supply, we find negligible impacts on wages in both models with and without regional trends. This result is consistent with the excess demand for staff posited earlier.

D. IMPACTS ON QUALITY

As noted earlier, we measure the size of the immigrant population as relative to the nursing home census within an MSA, to account for the potential impact of immigration on nursing home entry, and model our outcomes as rates (e.g., the share of scheduled assessments where a pressure sore is detected). Table 7 shows the summary results for adverse event composite, hospitalizations, mortality, and successful community discharge from our preferred models that include state-MSA trends, while Table 8 presents results from models that exclude trends. Table 9 shows the results for each component of quality at the different periodicities for the short- and long-stay populations described previously. For brevity, we present results for Table 9 onward from only our preferred specifications.

We begin with results for the short-stay population at their 5-day, 14-day, and 30-day evaluations; the size of the sample is falling because of deaths and the exit of those short-stayers who are discharged after completing their nursing home–based rehabilitation. We find consistent evidence of increased quality associated with a rise in immigration. At each duration in column 1 of Table 7, we find a reduction in adverse outcomes with more immigration.

Table 9 shows the impacts on each of the components that make up the composite in Table 7. Some of these impacts are very sizable: We estimate that a one-unit increase in

30 Van Houtven et al. (2020) document this trend of holding multiple jobs across facilities.

31 Calculations are based on the 2007–18 ACS.

TABLE 6. Effect of immigration on nursing home staff wages

	Models with state-MSA trends			Models without state-MSA trends		
	Median CNA wage (1)	Median LPN wage (2)	Median RN wage (3)	Median CNA wage (4)	Median LPN wage (5)	Median RN wage (6)
Female immigrant population (weighted)	−0.00000241	−0.00000235	−0.00000192	−0.00000362[a]	−0.000000960	−0.00000167
	(0.00000245)	(0.0000106)	(0.0000126)	(0.000000493)	(0.00000187)	(0.00000285)
Observations	3,802	3,140	3,248	3,802	3,140	3,248
Sample average	12.76	22.68	29.46	12.76	22.68	29.46
% change per 1,000 female immigrants	−0.02	−0.01	−0.01	−0.03	−0.004	−0.01

Note: Immigration data are from the 2000–18 American Community Survey (ACS), while median hourly wage data for certified nursing assistants (CNAs), licensed practical nurses (LPNs), and registered nurses (RNs) are calculated from 2006–18 ACS by metropolitan statistical area (MSA). Wages are in 2018 dollars. Standard errors clustered at the state-MSA level are in parentheses. [a]$p < 0.01$.

TABLE 7. Effect of immigration on skilled nursing facility (SNF) outcomes

Variables	Assessment-based adverse event composite (1)	All hospitalizations (2)	Mortality (3)	Successful discharge to the community (4)
A. Day 5				
Immigrants per SNF resident (weighted, female)	−0.00216[a]	−0.000217[b]	0.00000823	
	(0.000644)	(0.0000910)	(0.0000572)	
Observations	18,004,817	23,860,705	32,631,967	
Std. dev. / sample mean	0.480	0.0524	0.0162	
Std. dev. effect / % change	−0.00451	−0.414	0.0509	
B. Day 14				
Immigrants per SNF resident (weighted, female)	−0.00244[a]	−0.000401[c]	0.0000606	
	(0.000566)	(0.000228)	(0.000116)	
Observations	13,952,074	23,860,705	32,631,967	
Std. dev. / sample mean	0.466	0.123	0.0429	
Std. dev. effect / % change	−0.00523	−0.325	0.141	
C. Day 30				
Immigrants per SNF resident (weighted, female)	−0.00242[a]	−0.000261	0.00000932	
	(0.000522)	(0.000263)	(0.000172)	
Observations	6,928,771	23,860,705	32,631,967	
Std. dev. / sample mean	0.477	0.207	0.0820	
Std. dev. effect / % change	−0.00508	−0.126	0.0114	
D. All quarters				
Immigrants per SNF resident (weighted, female)	−0.00223[a]	0.000176	0.0000433	
	(0.000665)	(0.000239)	(0.0000954)	
Observations	27,576,386	45,965,932	61,446,373	
Std. dev. / sample mean	0.449	0.242	0.129	
Std. dev. effect / % change	−0.00496	0.0726	0.0335	

TABLE 7. *Continued*

Variables	Assessment-based adverse event composite (1)	All hospitalizations (2)	Mortality (3)	Successful discharge to the community (4)
E. All new admissions				
Immigrants per SNF resident (weighted, female)				0.00240[a]
				(0.000383)
Observations				22,428,376
Std. dev. / sample mean				0.447
Std. dev. effect / % change				0.54

Note: Immigration data are from the 2000–18 American Community Survey, the components of the quality composite are from the 2008–18 Minimum Data Set (MDS), hospitalization data are from the 2008–18 MedPAR, mortality data are from the 2008–18 Master Beneficiary Summary File, and successful community discharge data are from the 2008–18 MedPAR and MDS. Panels A–C focus on short-stay residents of skilled nursing facilities (SNFs), with results in column 1 restricting to all 5-, 14-, or 30-day assessments and columns 2 and 3 looking for hospitalizations or mortality within 5, 14, or 30 days of admission to the nursing home. In the first column of panel D, the long-stay sample is identified as either quarterly/annual scheduled assessments or change in status assessments within 20 days of when the next scheduled assessment should have been, where there are no other assessments within 20 days of the expected assessment date. Columns 2 and 3 pool observations for each quarter, starting at admission and counting ahead 90 days from the beginning of each stay to discharge or mortality, and look for hospitalizations or mortality in each quarter. A successful discharge is an episode that lasts less than 100 days and does not have a readmission or death within 31 days of discharge. Panel E pertains to patients newly admitted to a nursing home, the sample used to examine effects on successful community discharge. This outcome, shown in column 4, is defined as a new SNF patient being discharged from the SNF to the community within 100 days without a hospitalization or death within 30 days of the SNF discharge. Hospitalization and successful discharge models exclude individuals with Medicare Advantage plans, as we cannot observe all hospitalizations for these individuals. Effect sizes are represented as standard deviations in column 1 and percentage changes in columns 2–4. Standard errors clustered at the state–metropolitan statistical area (MSA) level are in parentheses. All models control for resident age, race/ethnicity, dual eligible status, and gender; state-MSA unemployment rate; and state-MSA trends. [a]$p < 0.01$, [b]$p < 0.05$, [c]$p < 0.10$.

female immigrants per nursing home resident within an MSA leads to a 7 percent decline in the use of daily restraints. But the results are generally more modest, with the impact on quality being less than 1 percent of the mean. For the composite measure, we find consistent reduction in adverse outcomes of about 0.005 standard deviations from the mean per unit increase in immigration, implying that a 10 percent increase in female immigrants would reduce adverse outcomes by about 0.01 standard deviations.

TABLE 8. Effect of immigration on skilled nursing facility (SNF) outcomes without state-MSA trends

Variables	Assessment-based adverse event composite (1)	All hospitalizations (2)	Mortality (3)	Successful discharge to the community (4)
A. Day 5				
Immigrants per SNF resident (weighted, female)	0.000388	−0.0000904	0.0000127	
	(0.000765)	(0.000130)	(0.0000642)	
Observations	18,004,817	23,860,705	32,631,967	
Std. dev. / sample mean	0.480	0.0524	0.0162	
Std. dev. effect / % change	0.001	−0.172	0.0788	
B. Day 14				
Immigrants per SNF resident (weighted, female)	−0.000113	−0.000410	−0.0000132	
	(0.000729)	(0.000262)	(0.000110)	
Observations	13,952,074	23,860,705	32,631,967	
Std. dev. / sample mean	0.466	0.123	0.0429	
Std. dev. effect / % change	−0.0002	−0.332	−0.0308	
C. Day 30				
Immigrants per SNF resident (weighted, female)	−0.000955	−0.000768[c]	−0.000122	
	(0.000949)	(0.000409)	(0.000125)	
Observations	6,928,771	23,860,705	32,631,967	
Std. dev. / sample mean	0.477	0.207	0.0820	
Std. dev. effect / % change	−0.002	−0.371	−0.149	
D. All quarters				
Immigrants per SNF resident (weighted, female)	0.000530	−0.000975[b]	−0.000283[a]	
	(0.000614)	(0.000397)	(0.0000982)	
Observations	27,576,386	45,965,932	61,446,373	
Std. dev. / sample mean	0.449	0.242	0.129	

TABLE 8. *Continued*

Variables	Assessment-based adverse event composite (1)	All hospitalizations (2)	Mortality (3)	Successful discharge to the community (4)
Std. dev. effect / % change	0.001	−0.403	−0.219	
E. All new admissions				
Immigrants per SNF resident (weighted, female)				0.00143[b]
				(0.000680)
Observations				22,428,376
Std. dev. / sample mean				0.447
Std. dev. effect / % change				0.320

Note: Immigration data are from the 2000–18 American Community Survey, the components of the quality composite are from the 2008–18 Minimum Data Set (MDS), hospitalization data are from the 2008–18 MedPAR, mortality data are from the 2008–18 Master Beneficiary Summary File, and successful community discharge data are from the 2008–18 MedPAR and MDS. Panels A–C focus on short-stay residents of skilled nursing facilities (SNFs), with results in column 1 restricting to all 5-, 14-, or 30-day assessments and columns 2 and 3 looking for hospitalizations or mortality within 5, 14, or 30 days of admission to the nursing home. In the first column of panel D, the long-stay sample is identified as either quarterly/annual scheduled assessments or change in status assessments within 20 days of when the next scheduled assessment should have been, where there are no other assessments within 20 days of the expected assessment date. Columns 2 and 3 pool observations for each quarter, starting at admission and counting ahead 90 days from the beginning of each stay to discharge or mortality, and look for hospitalizations or mortality in each quarter. A successful discharge is an episode that lasts less than 100 days and does not have a readmission or death within 31 days of discharge. Panel E pertains to patients newly admitted to a nursing home, the sample used to examine effects on successful community discharge. This outcome, shown in column 4, is defined as a new SNF patient being discharged from the SNF to the community within 100 days without a hospitalization or death within 30 days of the SNF discharge. Hospitalization and successful discharge models exclude individuals with Medicare Advantage plans, as we cannot observe all hospitalizations for these individuals. Effect sizes are represented as standard deviations in column 1 and percentage changes in columns 2–4. Standard errors clustered at the state–metropolitan statistical area (MSA) level are in parentheses. All models control for resident age, race/ethnicity, dual eligible status, and gender; state-MSA unemployment rate; and state-MSA trends. [a]$p < 0.01$, [b]$p < 0.05$, [c]$p < 0.10$.

Panel D of Table 7 turns to the long-stay population, where we stack all 90-day MDS evaluations and add control variables to our regression models accounting for length of stay. As before, we see a significant decline in the adverse event composite of a similar magnitude as found in the short-stay population—0.005 standard deviations per unit increase in immigration or 0.01 standard deviations for a 10 percent increase in female immigrants.

TABLE 9. Effect of immigration on nursing home assessment-based quality measures

Variables	Restraints (1)	Feeding tube (2)	Catheter (3)	Inappropriate antipsychotic meds (4)	Pressure ulcers (5)	UTI (6)
A. Day 5						
Immigrants per SNF resident (weighted, female)	−0.000300[a]	−0.000148[c]	−0.000333	−0.000597	NA	−0.00101[a]
	(0.0000632)	(0.0000803)	(0.000578)	(0.000376)	NA	(0.000368)
Observations	18,002,492	17,978,799	17,991,500	16,302,290	NA	18,001,484
Sample mean	0.00420	0.0450	0.138	0.0589	NA	0.171
% change	−7.137	−0.328	−0.241	−1.013	NA	−0.590
B. Day 14						
Immigrants per SNF resident (weighted, female)	−0.000408[a]	−0.000000607	−0.000617	−0.000680[*]	0.000198	−0.00125[a]
	(0.000100)	(0.0000874)	(0.000379)	(0.000411)	(0.000276)	(0.000403)
Observations	13,951,858	13,932,898	13,941,848	12,621,837	12,805,957	13,949,525
Sample mean	0.00570	0.0489	0.112	0.0605	0.145	0.182
% change	−7.164	−0.00124	−0.549	−1.123	0.137	−0.687

C. Day 30						
Immigrants per SNF resident (weighted, female)	−0.000542[a]	−0.0000191	−0.000210	−0.000644	−0.000160	−0.00112[b]
	(0.000125)	(0.000121)	(0.000177)	(0.000498)	(0.000221)	(0.000437)
Observations	6,928,688	6,916,350	6,921,421	6,193,949	6,910,067	6,927,127
Sample mean	0.00786	0.0605	0.0969	0.0643	0.151	0.171
% change	−6.891	−0.0315	−0.216	−1.001	−0.106	−0.656
D. All quarters						
Immigrants per SNF resident (weighted, female)	−0.000807[a]	0.000158	0.000176[a]	−0.00246[b]	−0.000184[b]	−0.000286
	(0.000182)	(0.000103)	(0.0000554)	(0.000953)	(0.0000921)	(0.000174)
Observations	27,575,999	27,552,350	27,571,001	20,366,586	27,518,301	27,568,217
Sample mean	0.0175	0.0468	0.0412	0.0974	0.0465	0.0429
% change	−4.607	0.338	0.428	−2.526	−0.396	−0.667

Note: Immigration data are from the 2000–18 American Community Survey and outcomes are from the 2008–18 Minimum Data Set. Panels A–C are restricted to all 5-, 14-, or 30-day assessments of residents of skilled nursing facilities (SNFs), respectively. The sample in panel D is restricted to either quarterly/annual scheduled assessments or change in status assessments within 20 days of when the next scheduled assessment should have been, where there are no other assessments within 20 days of the expected assessment date. See Table 1 for outcome definitions. Effect sizes are represented as percentage changes. Standard errors clustered at the state–metropolitan statistical area (MSA) level are in parentheses. All models control for resident age, race/ethnicity, dual eligible status, and gender; state-MSA unemployment rate; and state-MSA trends. [a]$p < 0.01$, [b]$p < 0.05$, [c]$p < 0.10$.

In Table 7, as for the short-stay population, we find a strong negative impact on the use of restraints. We also see a very large and significant reduction in inappropriate antipsychotic medication use. On the other hand, we now see positive impacts on feeding tubes and on catheters. Notably, increased catheterization is primarily problematic if it is inappropriate and leads to an increase in UTIs (Elpern et al. 2009). But we find a nonsignificant reduction in UTIs among long-stay residents when immigration increases, suggesting that any increase in catheterization may be clinically appropriate.

Columns 2 and 3 of Table 7 examine the impact on hospitalization and mortality as recorded in Medicare claims. For this analysis, we examine results within the first 5 days, 14 days, and 30 days after each nursing home admission to parallel our short-stay resident analyses from earlier. For long-stay residents, we examine these outcomes in each resident's 90-day period starting at their admission. Although this mirrors the analysis for our MDS-based outcomes, which is based upon quarterly assessments of residents, it differs in that the outcomes are measured over the full quarter rather than at the time of assessment. We find nonsignificant impacts on mortality at both short and long durations, suggesting that there are not meaningful impacts of immigration on patient mortality that would result in sample selection in our other quality measures.

On the other hand, we do find significant reductions in hospitalizations in the short run: For example, at 14 days, we find a reduction in hospitalizations of 0.3 percent per unit change in female immigrants per resident, or 0.6 percent for a 10 percent increase in female immigration. These effects fade over time and are negligible over the longer run, consistent with the risk of hospital readmission being greater during the first 14 days following hospital discharge and evidence that readmissions become less preventable as the time since hospital discharge increases (Graham et al. 2017; Burke et al. 2016). For comparison, a one-star increase in the CMS five-star quality score was found to reduce hospitalizations by about 3 percent (Cornell et al. 2019), while a 10 percent increase in the Medicaid payment rate above the average of about $100 per day was associated with 5 percent reduction in the odds of hospitalization (Intrator et al. 2007).

Column 4 of Table 7 presents the results for the successful discharge to the community for patients newly admitted to the SNF. Our sample size is smaller for this analysis than other short-stay-specific claims-based measures because this outcome is restricted to new admissions. Here again, increases in immigration are associated with improved quality—each one-unit increase in immigrants per resident results in a 0.0024 percentage point increase in the probability of a successful community discharge, or a 1.1 percent increase relative to the sample mean for a 10 percent increase in the immigrant population.

In contrast with our staffing estimates, we continue to find significant quality improvements in the claims-based quality outcomes when state-MSA trends are omitted (Table 8), including significant reductions in long-stay hospitalizations, short-stay hospitalizations at 30 days following admissions, and long-stay mortality, as well as significant improvements in the rate of successful discharge to the community for new admissions. Effects for the assessment-based composite measure, however, are sensitive to the inclusion of trends.

Taken together, these quality results paint a consistent picture of improved quality of care resulting from increased immigration. A natural supposition is that these improvements arise

through increased staffing. Directly tying the rise in staffing from our earlier analysis to the improvement in outcomes is challenging because of the sensitivity of these results to the inclusion of trends, and the fact that immigration may change not only the number of nursing home workers but also their characteristics (e.g., the share of workers who are full-time employees), which may independently be correlated with quality. Nevertheless, it is useful to compare our preferred estimates with those from previous research on the impact of nursing home staffing on patient outcomes.

Past literature generally finds that a 1 percent increase in staffing levels improves outcomes by 0.3–0.6 percent or 0.002–0.006 standard deviations.[32] In comparison, we estimate that a 10 percent rise in female immigrants leads to a 0.8 percent increase in staffing. Thus, our results imply that a 1 percent rise in staffing would improve composite quality by 0.012 and 0.011 standard deviations for short- and long-stay residents, respectively, while individual domains of quality would improve by 0.8 percent (hospitalizations for short-stay residents), 1.0 percent (pressure sores for long-stayers), 1.7 percent (UTIs for short-stayers), 1.4 percent (successful community discharge), and 11.5–17.8 percent (restraint use for long- and short-stayers. respectively). Our results are therefore consistent with and toward the upper end of previous estimates of the impact of staffing on outcomes.

E. HETEROGENEITY OF IMPACTS ON QUALITY

We next examine whether the effects of immigration on quality vary by select resident characteristics. Table 10 presents results where our sample is divided by race and ADRD status. We focus in this table on the adverse event composite, mortality, and hospitalization, and successful community discharge, and we show results for 14 days (to summarize short stay) and all quarters stacked (to summarize long stay). Online Appendix Tables A4 and A5 report the full set of quality measures for short- and long-stay residents.

Overall, we do not find clear evidence of heterogeneity in quality effects. We find few significant differences across groups, and for those differences that do emerge, the message is quite mixed. On the one hand, we see stronger quality measure improvements for Blacks and those with ADRD. But those groups also see the positive mortality impacts as well, suggesting potential selection bias in the quality measures.

We also examine immigrant heterogeneity: Do certain types of immigrants have more significant impacts on patient quality? To measure immigrant staff heterogeneity, we decompose our female immigrant population and instrumental variables by English and non-English speaking, Black and non-Black, and Hispanic and non-Hispanic. We measure the share of immigrants from each birthplace who fell into each category in the 2005 ACS,

32 For example, state-imposed minimum staffing ratios that increased CNA staffing by about 5 percent were found to reduce care deficiency citations by about 3 percent (Chen and Grabowski 2015), or 0.03 standard deviations of the sample mean. Increases in Medicaid payment rates to nursing homes of about 10 percent were found to increase staffing levels by about 6 percent and reduce the use of restraints by 2 percent (0.01 standard deviations) and the incidence of pressure sores by 7 percent (0.002 standard deviations) (Grabowski 2004). State wage pass-through subsidies were found to increase CNA staffing by 1 percent on average and to reduce the incidence of pressure sores by 0.9 percent (0.03 standard deviations) (Foster and Lee 2015).

TABLE 10. Effect heterogeneity by patient characteristics

	Adverse event composite		Hospitalizations		Mortality		Successful discharge
Variables	Short stay (1)	Long stay (2)	Short stay (3)	Long stay (4)	Short stay (5)	Long stay (6)	New admits (7)
A. White, non-Hispanic							
Immigrants per SNF resident (weighted, female)	−0.00230[a]	−0.00200[a]	−0.000392	0.000226	0.0000367	−0.0000265	0.00266[a]
	(0.000573)	(0.000730)	(0.000321)	(0.000278)	(0.000169)	(0.000143)	(0.000453)
Observations	11,075,970	20,941,644	18,743,243	35,591,553	25,289,783	47,167,010	17,635,545
Std. dev. / sample mean	0.446	0.438	0.118	0.234	0.0443	0.134	0.466
Std. dev. effect / % change	−0.00515	−0.00457	−0.333	0.0966	0.0829	−0.0197	0.570
B. Black, non-Hispanic							
Immigrants per SNF resident (weighted, female)	−0.00374[a]	−0.00265[a]	−0.000788[a]	0.000109	0.000174[b]	0.000262[c]	0.00160[a]
	(0.000838)	(0.000868)	(0.000257)	(0.000473)	(0.0000785)	(0.000142)	(0.000470)
Observations	1,705,092	3,935,604	3,010,759	6,123,885	4,252,948	8,366,926	2,819,189
Std. dev. / sample mean	0.524	0.482	0.153	0.283	0.0365	0.112	0.355
Std. dev. effect / % change	−0.00713	−0.00551	−0.515	0.0386	0.477	0.233	0.452
C. Hispanic							
Immigrants per SNF resident (weighted, female)	−0.00234[a]	−0.00253[b]	−0.000195	0.000134	0.000186	0.000233[c]	0.00202[a]
	(0.000732)	(0.00121)	(0.000342)	(0.000221)	(0.000127)	(0.000133)	(0.000469)
Observations	755,574	1,728,612	1,321,636	2,679,342	2,034,176	3,842,198	1,235,508
Std. dev. / sample mean	0.536	0.481	0.137	0.263	0.0377	0.112	0.389
Std. dev. effect / % change	−0.00437	−0.00527	−0.142	0.0509	0.492	0.209	0.519

D. ADRD							
Immigrants per SNF resident (weighted, female)	−0.00379[a]	−0.00253[a]	−0.0000395	0.000533[b]	0.000260	0.000338[b]	0.00532[a]
	(0.000787)	(0.000665)	(0.000611)	(0.000231)	(0.000426)	(0.000131)	(0.00126)
Observations	3,209,707	15,249,343	1,117,199	12,685,421	1,357,682	16,417,354	916,888
Std. dev. / sample mean	0.540	0.431	0.0681	0.133	0.0214	0.0983	0.357
Std. dev. effect / % change	−0.00702	−0.00588	−0.0580	0.401	1.216	0.344	1.490
E. Not ADRD							
Immigrants per SNF resident (weighted, female)	−0.00204[a]	−0.00147	−0.000476[c]	0.0000556	0.0000334	−0.00000766	0.00230[a]
	(0.000417)	(0.000889)	(0.000251)	(0.000246)	(0.000125)	(0.000149)	(0.000365)
Observations	10,742,367	12,327,043	22,743,531	33,280,511	31,274,201	45,029,019	21,511,488
Std. dev. / sample mean	0.435	0.469	0.126	0.284	0.0439	0.141	0.451
Std. dev. effect / % change	−0.00469	−0.00312	−0.378	0.0196	0.0760	−0.00544	0.510

Note: Immigration data are from the 2000–18 American Community Survey, the components of the quality composite are from the 2008–18 Minimum Data Set, hospitalization data are from the 2008–18 MedPAR, and mortality and skilled nursing facility (SNF) resident characteristics are from the 2008–18 Master Beneficiary Summary File. Short-stay analyses in column 1 are restricted to all 14-day assessments, while columns 3 and 5 look for hospitalizations or mortality within 14 days of admission to the nursing home. Long-stay analyses in column 2 are restricted to either quarterly/annual scheduled assessments or change in status assessments within 20 days of when the next scheduled assessment should have been, where there are no other assessments within 20 days of the expected assessment date. Columns 4 and 6 pool observations for each quarter, starting at admission and counting ahead 90 days from the beginning of each stay to discharge or mortality, and look for hospitalizations or mortality in each quarter. Column 7 pertains to patients newly admitted to a nursing home. Hospitalization and successful discharge models exclude individuals with Medicare Advantage plans, as we cannot observe all hospitalizations for these individuals. Effect sizes are represented as standard deviations in columns 1 and 2 and percentage changes in columns 3–7. Standard errors clustered at the state–metropolitan statistical area (MSA) level are in parentheses. All models control for resident age, race/ethnicity, dual eligible status, and gender; state-MSA unemployment rate; and state-MSA trends.
[a]$p < 0.01$, [b]$p < 0.05$, [c]$p < 0.10$.

TABLE 11. Effect heterogeneity by immigrant characteristics

Variables	Total staffing per resident day (1)	Adverse event composite: Short stay (2)	Adverse event composite: Long stay (3)	Hospitalizations: Short stay (4)	Hospitalizations: Long stay (5)	Mortality: Short stay (6)	Mortality: Long stay (7)	Successful discharge: New admits (8)
A. English speaking								
Immigrants per SNF resident (weighted, female)	0.0264[a]	−0.00414[a]	−0.00349[a]	−0.000608	0.000554	0.0000499	0.000159	−0.000218[b]
	(0.00985)	(0.00152)	(0.00127)	(0.000511)	(0.000477)	(0.000194)	(0.000162)	(0.0000886)
Effect in % or std. dev.	0.696	−0.00893	−0.00778	−0.493	0.229	0.116	0.123	−0.0487
B. Non-English speaking								
Predicted non-English-speaking immigrants per SNF resident (weighted)	0.0225[b]	−0.00439[a]	−0.00426[a]	−0.000763[c]	0.000261	0.000143	0.0000567	−0.000145[a]
	(0.00924)	(0.000918)	(0.00125)	(0.000392)	(0.000444)	(0.000221)	(0.000161)	(0.0000516)
Effect in % or std. dev.	0.591	−0.00947	−0.00949	−0.618	0.108	0.333	0.0438	−0.0325
C. Predicted Black								
Immigrants per SNF resident (weighted, female)	0.0273[b]	−0.00383[a]	−0.00322[a]	−0.000701[c]	0.000905[b]	−0.0000761	−0.0000181	−0.000150[b]
	(0.0106)	(0.00131)	(0.000943)	(0.000424)	(0.000436)	(0.000153)	(0.000144)	(0.0000653)
Effect in % or std. dev.	0.720	−0.00826	−0.00717	−0.568	0.374	−0.176	−0.0140	−0.0336
D. Predicted non-Black								
Immigrants per SNF resident (weighted, female)	0.0203[b]	−0.00420[a]	−0.00409[a]	−0.000665	0.0000342	0.000200	0.000152	−0.000164[a]
	(0.00799)	(0.00114)	(0.00119)	(0.000438)	(0.000408)	(0.000209)	(0.000163)	(0.0000458)
Effect in % or std. dev.	0.534	−0.00905	−0.00912	−0.539	0.0141	0.465	0.118	−0.0367

E. Predicted Hispanic								
Immigrants per SNF resident (weighted, female)	0.0358[b]	−0.00814[a]	−0.00868[a]	−0.00185[a]	−0.000446	0.000374	0.000126	−0.000244[a]
	(0.0150)	(0.00189)	(0.00227)	(0.000653)	(0.00101)	(0.000422)	(0.000303)	(0.0000743)
Effect in % or std. dev.	0.943	−0.0175	−0.0194	−1.499	−0.184	0.866	0.0972	−0.0546
F. Predicted non-Hispanic								
Immigrants per SNF resident (weighted, female)	0.0186[a]	−0.00289[a]	−0.00249[a]	−0.000359	0.000512[c]	0.0000365	0.0000779	−0.000133[b]
	(0.00651)	(0.000854)	(0.000768)	(0.000360)	(0.000282)	(0.000137)	(0.000118)	(0.0000544)
Effect in % or std. dev.	0.489	−0.00622	−0.00555	−0.290	0.211	0.0846	0.0602	−0.0298
Observations	126,901	13,952,074	27,576,386	23,860,705	45,965,932	32,677,532	61,446,373	22,428,288
Std. dev. / sample mean	3.796	0.464	0.449	0.123	0.242	0.0431	0.129	0.447

Note: Immigration data are from the 2000–18 American Community Survey (ACS), staffing data are from CASPER and at the facility level, resident-level data for the components of the quality composite are from the 2008–18 Minimum Data Set, resident-level data on mortality are from the 2008–18 Master Beneficiary Summary File, and resident-level data on hospitalization are from the 2008–18 MedPAR. Our "concordance" instruments are built like the overall instruments for female immigration, weighted by the relative probability of being a certified nursing assistant, except that we split the list of birthplaces into two groups for each subgroup (English, Black, Hispanic). To split the sample by race/ethnicity, we calculate the national share of immigrants from each birthplace who reported being Black or Hispanic in 2005. We then rescale each year's instrument by this share (or 1 − this share) to predict the number of immigrants likely to be in each category. For the English versus non-English instruments, we calculate the national share of people in each broader birthplace category in 2005 who are from countries where English is an official or recognized language (using the more detailed ACS birthplace variable). We then rescale each year's instrument by this share (or 1 − this share) to predict the number of immigrants likely to be in each language category. Short-stay quality composite analyses are restricted to day 14 assessments, while long-stay quality composite analyses are restricted to either quarterly/annual scheduled assessments or change in status assessments within 20 days of when the next scheduled assessment should have been, where there are no other assessments within 20 days of the expected assessment date. Short-stay analyses in columns 4 and 6 look for hospitalizations or mortality within 14 days of each admission to a nursing home, while long-stay analyses in columns 5 and 7 pool observations for each quarter, starting at admission and counting ahead 90 days from the beginning of each stay to discharge or mortality, and look for hospitalizations or mortality in each quarter. Column 8 pertains to patients newly admitted to a nursing home. Hospitalization and successful discharge models exclude Medicare Advantage beneficiaries, as we have incomplete hospitalization data for them. Effect sizes for staffing, hospitalizations, and mortality are represented as percentage changes, while those for the quality composite are in standard deviations. Standard errors clustered at the state–metropolitan statistical area (MSA) level are in parentheses. All models control for resident age, race/ethnicity, dual eligible status, and gender; state-MSA unemployment rate; and state-MSA trends. [a]$p < 0.01$, [b]$p < 0.05$, [c]$p < 0.10$.

apply this fraction to the population from each birthplace in subsequent MSA-years, and then sum the measures to the MSA-level. For race and ethnicity, we use the race and ethnicity variables directly in the ACS, while for English and non-English speaking, we identify the share of immigrants from the broader birthplace categories (which we use when building our instrument) that were from a country with English as an official or recognized language (identified using the more detailed birthplace categories in the ACS). This procedure is used to produce disaggregated versions of both our instrument and our endogenous regressor.

The results of this immigrant heterogeneity analysis are presented in Table 11. There are two sets of rows for each of the three immigrant group comparisons we carry out (i.e., English speaking vs. non-English speaking; Black race vs. non-Black race; Hispanic ethnicity vs. non-Hispanic). The first column of Table 11 shows the impact on total direct-care hours (the full set of staffing results are show in Online Appendix Table A6). We see that the impacts are fairly comparable by language and race, but that the impacts are much larger for Hispanic than non-Hispanic immigration. Hispanic female immigration yields roughly twice as large a staffing increase as non-Hispanic immigration, with a one-unit increase in our female Hispanic immigrant instrument resulting in an increase of 0.036 total direct-care hours per resident day compared with a 0.019 hour per resident day increase for non-Hispanic female immigrants.

The remaining columns of Table 11 show the same set of quality results from Table 10 but separated by immigrant group rather than patient group (full quality results for short- and long-stay residents are presented in Online Appendix Tables A7 and A8, respectively). The staffing effects carry over to the quality outcomes, with Hispanic female immigration having between two and five times the effect of non-Hispanic immigration on the quality composite and short-stay hospitalizations. One possible reason that the effect on quality is larger than what would be implied by the effect on staffing is evident in Online Appendix Table A6. Hispanic female immigration has a disproportionate effect on CNA and RN staffing, while non-Hispanic female immigration primarily increases CNA and LPN staffing, suggesting that Hispanic immigration yields both a larger increase in total staffing and an improvement in the staffing skill mix.

F. ROBUSTNESS CHECKS

Table 12 displays results for our main staffing and quality outcomes of a sensitivity analysis where we used alternate base years, further removed from our study window, to construct our instrument. The base year used makes little practical difference for our findings. Online Appendix Tables A9 and A10 display the results of the multiple instrumentation approach proposed by Jaeger et al. (2018) to address serial correlation in immigrant inflows for staffing and quality outcomes, respectively. Results are directionally similar to our main results, though with some loss of precision, which may be expected because of the correlation between the current and lagged instruments. When we use a different base year to construct the lagged instrument, we find similar results to when the multiple instruments are constructed from the same year, but with more precision (Online Appendix Tables A11 and A12).

Collectively, our results appear highly robust to concerns about serial correlation, though we acknowledge that our estimated effects may partially reflect longer-run impacts in addition to immediate effects. Regardless, the short- and medium-term effects of policies

that expand the immigrant labor supply on nursing home staffing and quality are highly relevant for policy makers seeking to address the long-standing labor shortages in the long-term care market.

Online Appendix Tables A13 and A14 present results for staffing and health outcomes, respectively, from two additional robustness checks. In the first, we restrict the sample to a consistent set of nursing homes to address concerns about confounding from nursing home entry and exit during our study period. In the second, we limit our examination of assessment-based outcomes to only those years covered by the newer, higher-quality, MDS 3.0 data. Our results are substantively unchanged when using the consistent panel of nursing homes and MDS 3.0 data only.

VI. Conclusion

Increases in the immigrant population were found to improve the quality of nursing home resident care, particularly on measures likely to be directly impacted by the availability and quality of direct-care workers. In our preferred specifications, we find reductions in the use of physical restraints, the development of urinary tract infections, and rehospitalizations among short-stay rehabilitative residents, as well as increases in the likelihood of rehab patients being successfully discharged back into the community. Within the long-stay population, we find reductions in the use of physical and chemical (i.e., inappropriate antipsychotic medications) restraints and the development of pressure sores. In alternate models that exclude geographic trends, we found reductions in short- and long-stay resident hospitalization rates, reductions in long-stay resident mortality, and rates of new admissions being successfully discharged to the community.

Our preferred estimates indicate that these quality improvements likely stem from both increases in nursing home direct-care staffing ratios—with little impact on industry wages or the skill mix of direct-care staff—and improvements in staffing quality. The magnitude of our estimated quality effects are relatively large in comparison to the magnitude our primary staffing effect estimates, consistent with a staffing quality effect, and we find that CNA staffing effects from increased immigration were driven entirely by full-time workers, who prior literature has shown may provide better resident care compared with part-time staff. We note, however, that our staffing ratio effects were sensitive to the inclusion of geographic trends, so we are unable to rule out that the staffing quality mechanism dominates.

Our findings extend those of Furtado and Ortega (2026; see Online Appendix C for further discussion) and are consistent with persistent excess demand for direct-care staff in this industry. Our paper has several notable strengths relative to the prior literature in this space. We have rich patient-level data that are not subject to censoring and that allow us to construct detailed outcome measures that encompass both self-reported MDS outcomes and claims-based outcomes. Our MDS-based quality outcomes are calculated on a per-assessment basis that accounts for both changes in the size of the nursing home population and any changes in the frequency of patient evaluations (because of changes in health status, for example). The richness of our data also allows us to explore potential mechanisms through which quality improvements occur and heterogenous treatment

TABLE 12. Effect of immigration on nursing home outcomes: Different instrument base years

		Short stay			Long stay			New admissions
Variables	Direct care HPRD (1)	Adverse event composite (2)	Hospitalizations (3)	Mortality (4)	Adverse event composite (5)	Hospitalizations (6)	Mortality (7)	Successful discharge to the community (8)
A. 2005								
Immigrants per SNF resident (weighted, female)	0.0147[a]	−0.00244[a]	−0.000401[c]	0.0000606	−0.00223[a]	0.000176	0.0000433	0.00240[a]
	(0.00486)	(0.000566)	(0.000228)	(0.000116)	(0.000665)	(0.000239)	(0.0000954)	(0.000383)
Observations	126,901	13,952,074	23,860,705	32,631,967	27,576,386	45,965,932	61,446,373	22,428,376
Sample mean	3.796	0.466	0.123	0.0429	0.449	0.242	0.129	0.447
% change	0.388	−0.00523	−0.325	0.141	−0.00496	0.0726	0.0335	0.538
B. 1990								
Immigrants per SNF resident (weighted, female)	0.0169[b]	−0.00284[a]	−0.000562[a]	0.0000379	−0.00259[a]	0.000111	0.0000171	0.00317[a]
	(0.00711)	(0.000450)	(0.000175)	(0.000129)	(0.000780)	(0.000270)	(0.0000971)	(0.000865)
Observations	107,122	12,348,980	20,917,756	29,237,291	24,062,354	39,797,375	54,375,171	19,644,124
Sample mean	3.833	0.465	0.126	0.0423	0.450	0.248	0.129	0.446
% change	0.440	−0.00611	−0.447	0.0896	−0.00575	0.0448	0.0132	0.709

C. 1980

Immigrants per SNF resident (weighted, female)	0.0113[c]	−0.00249[a]	−0.000610[a]	−0.00000225	−0.00191[a]	0.0000470	0.0000181	0.00325[a]
	(0.00597)	(0.000350)	(0.000163)	(0.0000913)	(0.000474)	(0.000212)	(0.0000720)	(0.000799)
Observations	106,905	1,231,7831	20,862,729	29,174,008	24,014,104	39,700,834	54,264,320	19,593,572
Sample mean	3.833	0.465	0.126	0.0423	0.450	0.248	0.129	0.446
% change	0.295	−0.00534	−0.486	−0.00531	−0.00425	0.0189	0.0141	0.729

Note: Immigration data are from the 2000–18 American Community Survey (ACS), staffing data are from OSCAR-CASPER 2006–17, the components of the quality composite are from the 2008–18 Minimum Data Set (MDS), hospitalization data are from the 2008–18 MedPAR, mortality data are from the 2008–18 Master Beneficiary Summary File, and successful community discharge data are from the 2008–18 MedPAR and MDS. Immigration instrument measures are constructed with data from the 2000–05 ACS and 1990 and 1980 5 percent census samples for the relative probability weights and baseline immigrant population in panels A, B, and C, respectively, and with the 2005–18 ACS for national immigration flows by birthplace. Data on actual immigrant populations are from the 2005–18 ACS. All immigration measures are converted to a rate of immigrants relative to the current year's nursing home population from CASPER. Column 1 uses staffing data from 2006 to 2017 at the facility level; direct care HPRD is the daily hours from CNAs, LPNs, and RNs divided by the number of residents. Columns 2–4 focus on short-stay residents of skilled nursing facilities (SNFs), with results in column 2 restricted to all 14-day assessments while columns 3 and 4 look for hospitalizations or mortality within 14 days of admission to the nursing home. In column 5, the long-stay sample is identified as either quarterly/annual scheduled assessments or change in status assessments within 20 days of when the next scheduled assessment should have been, where there are no other assessments within 20 days of the expected assessment date. Columns 6 and 7 pool observations for each quarter, starting at admission and counting ahead 90 days from the beginning of each stay to discharge or mortality, and look for hospitalizations or mortality in each quarter. Column 8 focuses on all patients newly admitted to a nursing home. A successful discharge is an episode that lasts less than 100 days and does not have a readmission or death within 31 days of discharge. Hospitalization and successful discharge models exclude individuals with Medicare Advantage plans, as we cannot observe all hospitalizations for these individuals. Standard errors clustered at the state–metropolitan statistical area (MSA) level are in parentheses. All models control for resident age, race/ethnicity, dual eligible status, and gender; state-MSA unemployment rate; and state-MSA trends. [a]$p < 0.01$, [b]$p < 0.05$, [c]$p < 0.10$.

effects along several dimensions including short- versus long-stay status. Our advances on the standard shift-share instrumental variables analysis to better isolate immigrant flows that are likely to affect nursing home staffing produced a strong instrument, and our use of more recent and annual data help improve the applicability of our findings to current policy debates.

Inadequate staffing in nursing homes is a pressing policy issue, particularly in light of the recently finalized federal staffing minimums (*Federal Register* 2024). Despite these forthcoming mandates, there is no clear policy consensus on how best to increase the supply of direct-care workers to fill available openings. Increasing immigrant flows into the US may be one actionable policy solution to bolster the nursing home workforce and ensure that a rapidly aging population has access to high-quality long-term care.

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