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Original Article

The bodily scars of legal violence: local immigration enforcement, state immigrant policy, and health inequality

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Over the past three decades in the United States, a surge of federal, state, and local laws and policies has increased levels of immigration enforcement and eroded immigrant access to public services and benefits. While a large body of research documents the deleterious effects of these forms of *legal violence* for a range of immigrant outcomes like poverty, employment, and schooling, the health consequences of these sociopolitical shifts for aging adults remain to be better understood. Linking panel data from the Health and Retirement Study (2004–2016) (*n* = 18,259) to longitudinal data on county immigration enforcement and state immigrant policies, we estimate three-way fixed-effects models to examine how changes in immigration enforcement and policy shape physical and physiological health at the intersection of race-ethnicity and immigration status. Results show that as local immigration enforcement intensifies and state policy contexts become more hostile toward immigrants, foreign-born adults—especially Latinx immigrants—experience accelerated health decline. Like episodes of physical violence that can leave lacerations and damage—both visible and more concealed—our results provide evidence of the health harms of state-sanctioned violence: what we call *bodily scars of legal violence*. Taken together, this research shows how policies governing the surveillance and control of immigrants not only shape structures of racial domination and immigrant exclusion but the embodied health inequities that flow from them, with implications for understanding and redressing inequities in health and aging.

Key words: immigration; health; aging; state policy.

Introduction

Over the past three decades in the United States, a surge of federal, state, and local laws and policies has increased levels of immigration enforcement (Coleman 2012; Moinester 2018), eroded immigrant access to public services and benefits (Reich 2017; Ybarra, Sanchez, and Sanchez 2016), and contributed to heightened levels of racist and xenophobic animus (Flores 2014). These shifts in the sociopolitical landscape have profoundly shaped the contexts where immigrants live, work,

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and age. Aggressive enforcement actions and restrictive immigrant policies can derail pathways of immigrant incorporation, in highly racialized ways (Jiménez et al. 2021; Menjívar 2021). A growing body of research documents the deleterious effects of hostile, unwelcoming, and exclusionary laws, policies, and institutional practices for a range of immigrant outcomes, including poverty (Amuedo-Dorantes, Arenas-Arroyo, and Sevilla 2018), employment (Lim and Paik 2022), and utilization of health care and social services (Boen, Schut, and Graetz 2024; Cervantes and Menjívar 2020; Friedman and Venkataramani 2021; Schut and Boen 2022; Watson 2014). Menjívar and Abrego (2012) used the term *legal violence* to refer to the damaging aspects and effects of immigration laws and policies and the structural and symbolic violence they create and intensify.

A growing body of research links immigration enforcement and policy to health. Heightened levels of enforcement and anti-immigrant policies can increase feelings of fear and stress and reduce access to and use of health-promoting resources in ways that increase health risks and generate health inequities by race-ethnicity, nativity, and legal status (Boen et al. 2024; Cervantes and Menjívar 2020; Friedman and Venkataramani 2021; Philbin et al. 2018; Schut and Boen 2022; Tome et al. 2021; Toomey et al. 2014; Torche and Sirois 2019; Van Natta and Meredith 2023; Wang and Kaushal 2018; Watson 2014; De Young et al. 2023).

Still, despite burgeoning work in this area, two gaps warrant attention. First, how *changes* in immigration enforcement and policy shape *changes* in health and health inequality as individuals age remains to be better understood. Immigration enforcement rates have skyrocketed over the past two decades, though unevenly across and within states (Moinester 2018). Immigrants have not only been subject to workplace and community raids but to repeated and ongoing surveillance by federal, state, and local law enforcement (Menjívar and Abrego 2012). At the same time, state legislatures have passed hundreds of restrictive, anti-immigrant laws in over the past 20 years (Reich 2017, 2021). In sum, enforcement and policy contexts have changed drastically. And just as sociopolitical landscapes are dynamic over time, so too are trajectories of health, which shift in response to changing social and contextual exposures (Burgard et al. 2020; Ferraro and Shippee 2009). Still, much of the research in this area focuses on cross-sectional associations between immigration policy or enforcement and health at one point in time or over relatively short periods, with less attention to how changing enforcement and policy contexts shape intra-individual, longitudinal patterns of health. Second, little is known about the health consequences of changing immigrant policy and enforcement contexts for older adults (Morales and Josefina 2021). Most research in this area has focused on children and working-aged adults, but it remains largely unknown whether and how the changing sociopolitical landscape has altered later life patterns of aging in later life, including differentially by race-ethnicity and nativity.

This study merges longitudinal, individual-level survey data to longitudinal data on county-level immigration enforcement and state-level immigrant policy and uses three-way fixed-effects models to assess the links between local levels of immigration enforcement, state immigrant policy contexts, and markers of physiological and physical well-being among aging adults in the United States. We have two overarching aims:

1) *Examine how changes in county-level immigration enforcement pattern changes in health across mid- to late-adulthood, assessing for differential associations by race-ethnicity and nativity.*
2) *Assess how changes in state immigrant policy contexts shape changes in health across mid- to late-adulthood, assessing for differential associations by race-ethnicity and nativity.*

In our investigation, we include longitudinal markers of health and aging—including a measure of physiological functioning using multiple biomarkers and an indicator of functional limitations—and pay particular attention to how local enforcement contexts and state policy environments differentially pattern age-related health changes at the intersection of race-ethnicity and immigration status. Critically, our use of longitudinal biomarker data allows us to *directly* observe changes in the body over time in ways that have not been previously possible with existing data.

Results from our study provide new evidence of the physical and physiological toll of legal violence for aging adults in the United States. We find that as local levels of immigration enforcement intensify and state immigrant policy contexts become more restrictive, older immigrants experience accelerated physiological and physical decline. While restrictive state immigrant policies are associated with worse health for both White and Latinx foreign-born adults, results show that the health harms of immigration enforcement are concentrated among Latinx immigrants, highlighting the highly racialized nature of this form of legal violence (Armenta 2017; Donato and Rodríguez 2014). Like episodes of physical violence that leave lacerations and damage—both visible and more concealed—our study provides evidence of the physiological and physical harms caused by state-sanctioned violence—what we call *bodily scars of legal violence*. Taken together, this research shows how policies governing the surveillance and control of immigrants not only shape structures of racial domination and immigrant exclusion but the embodied health inequalities that flow from them, with implications for understanding and redressing inequities in health and aging.

Background

A patchwork: immigration enforcement and policy in the United States

In the midst of federal immigration policy stagnation, state legislatures have played an increasingly prominent role in immigrant policy making in the U.S. in recent decades (Reich 2021). In addition to crafting and executing their own immigrant policies, state and local governments have considerable discretion in implementing and enforcing federal immigration policy (Moinester 2018; Pedroza 2019). As a result, there is substantial heterogeneity in immigration enforcement and policy contexts within the United States (Jiménez et al. 2021).

At the federal level, the 287(g) and the Secure Communities programs played central roles in expanding immigration enforcement in the United States in recent decades (Coleman 2012). The 287(g) program allows state, county, and local law enforcement to enter into formal agreements with the federal government to perform certain immigration enforcement functions, including investigating immigration cases, arresting and detaining noncitizens, and assisting in putting together immigration cases, among other historically federal functions (Seghetti, Vina, and Ester 2009). The Secure Communities program was launched in 2009 by the Department of Homeland Security and was designed to identify immigrants in US jails who were potentially deportable. Under Secure Communities, jails submit fingerprints to immigration databases, allowing Immigration, Customs, and Enforcement (ICE) to use this biometric information to identify unauthorized immigrants. Together, these programs drastically expanded immigrant detentions and removals in the United States.

Importantly, these programs changed both the intensity and the geography of enforcement, shifting efforts into the US interior and making "everyday spaces away from state borders… sites of immigrant surveillance and regulation" (Coleman 2012: 164). Still, this happened unevenly across and within US states. Though they are federal programs, 287(g) and Secure Communities devolved immigration enforcement to state and local law enforcement (Coleman 2012; Pedroza 2013, 2019). State and local discretion in program participation produced subnational, substate, and hyperlocal variability in enforcement (Moinester 2018; Pedroza 2019).

In addition to enforcement, there has also been a surge of immigrant policies at the state level in recent years (Reich 2017, 2021). Given the current study's focus on the consequences of *legal violence*, we pay particular attention to the nature and patterning of restrictive state policies, which are those that aim to restrict immigrant access to public services and benefits, employment, state licenses, and housing and/or enlist state or local law enforcement agencies in efforts to identify unauthorized immigrants (Reich 2017, 2019; Ybarra et al. 2016). There are extreme examples of especially restrictive state immigrant policies—like "show me your papers" laws, for example—but states have passed hundreds of anti-immigrant policies over the past several decades in the United States (Reich 2021).

Racialized legal violence

A large body of research investigates the consequences of these changes to the immigrant policy and enforcement landscape and shows that the impacts of these shifts have been highly stratified by race-ethnicity and legal status (Abrego and Lakhani 2015; Bacong and Menjívar 2021; Morales and Josefina 2021; Menjívar and Abrego 2012). In recent years, efforts to surveil, exclude, and control immigrants have been directed largely at Latinx immigrants (Armenta 2017). Furthermore, though the stated goals of many federal, state, and local immigration policies are to identify and exclude undocumented immigrants—especially those convicted of committing crimes—in practice they marginalize and harm those who are *racialized* as potentially undocumented (Armenta 2017; Asad and Clair 2018; Flores and Schachter 2018; Jiménez et al. 2021; Menjívar 2021).

Because legal status is "written upon bodies" (Flores and Schachter 2018: 840) and relationally constructed through interpersonal and institutional interactions (Donato and Armenta 2011; Menjívar 2023), the harms of legal violence are not limited to unauthorized immigrants but can extend to individuals who might be *perceived* as potentially undocumented, regardless of legal status (Donato and Rodríguez 2014). In this way, immigration laws, policies, and practices socially construct and reify racialized legal status hierarchies in ways that can "spread" the harms of legal violence to Latinx people broadly (Armenta 2017; Asad and Clair 2018; Flores and Schachter 2018; Menjívar 2021).

Pathways influencing trajectories of health and aging

In this study, we draw on the concept of *legal violence* (Menjívar and Abrego 2012) to theorize how aggressive enforcement and restrictive policy contexts shape patterns of health and aging, especially among Latinx adults in the United States. Compared to US-born individuals, immigrants typically live longer lives (Lariscy, Hummer, and Hayward 2015). This is due, in part, to strong selection forces influencing who can successfully migrate (Riosmena, Kuhn, and Jochem 2017). Importantly, however, both US- and foreign-born Latinx individuals experience elevated health risks, including high levels of functional limitations (Garcia et al. 2017), physiological dysregulation (Boen and Hummer 2019; García and Ailshire 2019), and other health problems (García, Garcia, and Ailshire 2022). Importantly, as Latinx immigrants' duration of stay in the United States increases, their health and mortality risks generally increase (Riosmena et al. 2015). As Brown (2018: 1507) theorized, "among nonwhite immigrants, the immigrant health advantage may be offset by cumulative exposure to racialized immigrant incorporation processes."

In this study, we consider local levels of enforcement and state immigrant policy contexts as critical components of the sociopolitical landscape that shape the "racialized immigrant incorporation processes" that Brown (2018) described. We posit that legal violence can shape the health of aging adults through several channels. Heightened enforcement and restrictive policy can increase stress, fear, and stigmatization (Becerra et al. 2020; Cervantes and Menjívar 2020) in ways that directly and indirectly affect health. Unauthorized immigrants may feel directly threatened by heightened levels of detention and/or deportation. Even those with legal status may fear the detention or deportation of family members, friends, or community members (Asad 2020; Cervantes and Menjívar 2020; Rodriguez, Paredes, and Hagan 2017). Recent surveys show that roughly four in ten Latinx individuals reported worrying about deportation, with especially high levels of deportation-related worry among Latinx immigrants (Moslimani 2022). Aggressive enforcement and restrictive policy can also stigmatize and criminalize immigrants in ways that associate them with criminality (Armenta 2017; Menjívar and Abrego 2012) and increase experiences with discrimination (Almeida et al. 2016). Together, this stress, fear, worry, and stigmatization can shape health risks through a variety of mechanisms.

In response to stressful, stigmatizing, and otherwise toxic social exposures, the hypothalamic–pituitary–adrenal axis and sympathetic nervous system secrete hormones to upregulate functioning across physiological systems (McEwen 1998, 2007). Persistent or repeated activation of these systems in response to chronic stress wears on the body, resulting in heightened levels of physiological dysregulation and accelerated health decline. This bodily "wear and tear" creates a chronic state of biological susceptibility to further pathophysiological damage, increasing morbidity and mortality risks from a host of causes (McEwen 2022). Stress and stigmatization can also affect health more indirectly through behavioral pathways by increasing risks of health-harming coping behaviors (Pearlin 1989).

Heightened enforcement and restrictive policy contexts might also increase health risks by reducing access to and use of health care and other health-promoting benefits and services (Boen et al. 2024; Cervantes and Menjívar 2020; Friedman and Venkataramani 2021; Rhodes et al. 2015; Schut and Boen 2022; Van Natta and Meredith 2023). Restrictive immigrant policies can purposely exclude immigrants from accessing public benefits like Medicaid and other social welfare programs in ways that lower program participation and benefits utilization (Jimenez 2021; Reich 2017). Hostile policy and enforcement contexts can also indirectly affect utilization and program participation, even among those who remain eligible, by creating "icy" policy environments (Schut and Boen 2022; Watson 2014). These so-called "chilling effects" can arise when immigrants fear having their legal status disclosed in the context of institutional engagement, even when they retain eligibility for programs and services. Individuals with legal status can also experience chilled benefits utilization and program participation if they fear stigmatization or discrimination or the detention or deportation of family members, friends, and other network members (Asad and Clair 2018) or experience confusion about program eligibility as they navigate ever-changing public charge rules. These reductions in benefits utilization and program participation can shape health by delaying or foregoing medical care and restricting access to health-promoting material access like food, housing, and income.

A growing body of research links immigration enforcement and restrictive immigrant policies to health. Studies link the adoption of 287(g) and Secure Communities to increased levels of mental distress and worse self-rated health (Wang and Kaushal 2018) and low birth weight (Amuedo-Dorantes, Churchill, and Song 2022; Ro, Bruckner, and Duquette-Rury 2020; Tome et al. 2021). Heightened levels of enforcement have been associated with increased disability risks among recently arrived Latinx noncitizens (Pedroza and Chung 2021), worse self-rated health and increased psychological distress among Asian and Latinx immigrants (De Young et al. 2023), and "chilled" healthcare utilization among Latinx people more generally (Friedman and Venkataramani 2021; Rhodes et al. 2015).

Studies also link restrictive state immigrant policies to adverse health-related outcomes for both immigrants and Latinx people, more broadly (Philbin et al. 2018). For example, the passage of California Proposition 187—a 1994 ballot imitative that restricted unauthorized immigrants from accessing many state public services—was associated with increases in health risks among Latinx and foreign-born individuals (Fenton, Catalano, and Hargreaves 1996; Spetz et al. 2000). Studies have linked Arizona's SB1070 to reductions in birthweight (Torche and Sirois 2019), decreased utilization of healthcare and public services (Toomey et al. 2014), and reduced psychological well-being (Santos, Menjívar, and Godfrey 2013) among Latinx individuals.

Despite a large body of work in this area, most research on state immigrant policy uses what Philbin et al. (2018) described as a "one-policy, one-level, one-outcome" approach. Fewer studies assess how changes in broad enforcement and policy climates pattern intra-individual changes health using longitudinal data, which limits causal inference and restricts understanding of how exposure to immigrant enforcement and policy contexts become "embodied" to shape health risks as people age, especially in directly observable, aging-related markers of health.

Contributions of the current study

This study improves understanding of the links between immigration enforcement and immigrant policy and health in three ways. First, our outcomes include longitudinal markers of physiological and physical functioning. By examining how changes in enforcement and policy shape within-person changes in health, our study offers important insights into the processes through which individuals come to embody exclusionary, stigmatizing, and toxic conditions in ways that generate population disparities across a range of aging-related outcomes (Krieger 2021).

Second, by merging individual-level panel data to longitudinal data on county-level enforcement and state-level policies, we examine how changes in multilevel sociopolitical contexts unequally pattern changes in health among aging adults. We conceptualize and operationalize state and local contexts as multilevel and dynamic. Drawing on the life course perspective (Elder and Johnson 2003), we also model health as a dynamic process that changes in response to social exposures. In doing so, we improve understanding of the multidimensional and time-varying processes contributing to population health and aging patterns.

Finally, this study focuses on the health consequences of immigration enforcement and state policy contexts for older adults—a large, growing, and diversifying segment of the US population (Hummer and Hayward 2015). Older immigrants, especially Latinx immigrants, have relatively high levels of immigration-related fear and worry (Rodriguez et al. 2017) and may be especially vulnerable to restrictive policy and enforcement contexts given their high levels of health risk (Boen and Hummer 2019; García et al. 2022). By investigating the links between local enforcement, state immigration policy, and health risks across later life, our study improves understanding the sociopolitical drivers of aging among older adults in the United States.

Data and methods

Data and samples

Data for this project come from four sources. First, individual-level data come from seven waves of the Health and Retirement Study (HRS): 2004, 2006, 2008, 2010, 2012, 2014, and 2016. The HRS is a nationally representative, longitudinal study of community-dwelling adults aged ≥50 years in the United States. The HRS collects rich information about the health of older adults, primarily through in-home interviews [for more information about the HRS, see Heeringa and Connor (1995) and Fisher and Ryan (2018)]. We use data on functional limitations from all seven HRS waves spanning from 2004 to 2016. Starting in 2006, HRS collected blood-based biomarkers on a random half of the sample of respondents and then collected biomarker data from the other half of the sample in 2008. These respondents were re-interviewed in 2010 and 2012 and again in 2014 and 2016, respectively, when they again provided biomarker samples. Our biomarker data therefore spans from 2006 to 2016, with respondents having a maximum of three biomarker observations over this period.

Second, data on immigration enforcement come from the Transactional Records Access Clearinghouse (TRAC) (TRAC Immigration n.d.). TRAC compiled data on detainers under the Secure Communities Program from case-by-case ICE records that were obtained after successful court litigation. Our data on ICE detainers spans 2002–2016.

Third, we use data on population size and composition from the 2000 Decennial Census and American Community Survey (ACS) estimates (2010–2016). Because county-level data were not available in the ACS until 2010, we interpolate data (linear interpolation) on county population between 2001 and 2009 using the 2000 Decennial Census and 2010 ACS.

Finally, data on restrictive immigration state laws come from the Correlates of State Policy Project (CSPP) (Grossman, Jordan, and McCrain 2021). CSPP data on these policies came from an original coding of 1,393 laws approved by state legislatures between 2005 and 2012 by Reich (2017). The data are available by state and year.

Our sample includes US- and foreign-born White and Latinx HRS respondents. Sample sizes for other groups were too small to make meaningful comparisons. We restrict our sample to respondents with valid outcome data in at least two survey waves. There was minimal missing data on the covariates; only the marital status and employment status variables had some missingness (<5 percent). Our final analytic sample includes a total of 18,259 individuals, with sample sizes varying by outcome. In total, we include 14,915 US-born White, 725 foreign-born White, 985 US-born Latinx, and 1634 foreign-born Latinx respondents.

Measures

Appendix A provides a summary of all the variables used in analyses and indicates the data source(s) and the years included in the analysis.

Outcomes

We include two outcomes from the HRS. The first is a composite indicator of *physiological dysregulation*, which reflects overall levels of physiological risk across a range of bodily systems. The biomarker data used in generating this measure are available in the HRS starting in 2006. Our measure of physiological dysregulation spans 2006–2016. Composite measures of physiological dysregulation aim to capture the "wear and tear" of bodily systems resulting from the biological aging process and/or exposure to toxic and adverse social and environmental conditions. High levels of physiological dysregulation have been associated with increased risks of morbidity and mortality from a range of causes (Arbeev et al. 2020). Our measure of physiological dysregulation includes several biomarkers derived from multiple bodily systems: C-reactive protein (CRP), a marker of inflammation and immune function; blood pressure, an indicator of cardiometabolic risk; HbA1c, an indicator of diabetes risk; total cholesterol and high density lipoprotein (HDL), measures of overall and "healthy" or "good" cholesterol, respectively; and waist circumference and body mass index (BMI), markers of metabolic risk. We use all of the biomarkers available in the HRS that are typically included in composite measures of allostatic load (e.g., Crimmins et al. 2003). To develop the composite biomarker measure, we constructed a dummy variable for each individual biomarker, where "1" indicates high risk according to clinical guidelines (CRP: ≥3 mg/L; blood pressure: systolic >140 mmHg or diastolic >90 mmHg; HbA1c: ≥5.7 percent; total cholesterol: ≥240 mg/dL; HDL cholesterol: ≤40 mg/dL; waist circumference: >102 cm for men and >88 cm for women; BMI: ≥30 kg/m^2). We then summed the individual measures to construct an indicator of physiological dysregulation (range = 0–7). Prior to creating the overall score, we cleaned all biomarker data and excluded outlier observations.

Second, we include a measure of *functional limitations*, captured through a three-item composite measure of Activities of Daily Living. In every wave of the HRS, respondents were asked about their difficulty bathing, eating, and dressing. For each activity, responses were coded "1" if the respondent indicated any difficulty. We summed the individual measures to create the composite measure (range: 0–3). Chronic exposure to stressful, damaging, or otherwise toxic social environments has been linked to increased risk of functional limitations (Verbrugge and Jette 1994). As such, measures of functional limitations have been used in past research to capture the effects of stressful or adverse social environments on physical health and disability risk (e.g., Brown 2018; Pedroza and Chung 2021). Our measure of functional limitations spans from 2004 to 2016.

We selected these two outcomes because they capture the body's nonspecific response to hostile social environments (McEwen 2022). We purposely avoided using measures of disease or diagnosis as they can be subject to concerns about misclassification error, where individuals who do not yet have a disease or who have not been officially diagnosed with disease are classified as "healthy," despite high levels of physiological or physical deterioration (Aneshensel, Rutter, and Lachenbruch 1991). Concerns about misclassification are particularly worrisome in this study, given that individuals may avoid seeking healthcare in response to aggressive enforcement or restrictive immigrant policy climates (Friedman and Venkataramani 2021; Schut and Boen 2022; Watson 2014), which could bias estimates.

Key exposures

We consider two key exposures. First, we constructed a longitudinal, cumulative, *county-level measure of ICE detainers*, which spans from 2002 to 2016. ICE places detainers on individuals who are not US citizens and who are arrested by local or state law enforcement on criminal charges. Detainers are written requests that law enforcement agencies or jails hold individuals for an additional 48 hours after the set release date so that ICE can decide whether to take the individual into federal custody for potential removal. Previous studies (e.g., Friedman and Venkataramani 2021; Ro et al. 2020) have used area-level measures of detainers to reflect local levels of immigrant enforcement. We created a longitudinal, county-level measure of cumulative ICE detainers, which reflects the cumulative number of detainers in the county per foreign-born county population. To generate the cumulative count of detainers, we used data from the TRAC and summed all detainers from the beginning of the time series (2002) in the respondents' county of residence until the month of the respective HRS interview. The cumulative measure accounts for the effects of longer-term exposure to increased ICE activity as well as the large proportion of county-months having zero detainers. Information about the county foreign-born population comes from the 2000 Decennial Census and ACS estimates. In supplementary analyses, we used alternative population denominators, including measures of total county Latinx population and total county foreign-born Latinx population; results of models using these alternative operationalizations were substantively similar to the results shown in the main text. To ease interpretation, in our multivariable models, we include the indicator of county-level ICE detainers as a standardized measure (mean = 0, SD = 1).

Second, we included a longitudinal indicator of number of *restrictive state immigrant policies*. This measure comes from the Correlates of State Policy Project and reflects the number of restrictive immigrant policies passed each year by state (Grossman, Jordan, and McCrain 2021; Reich 2017). The variable comes from an original coding of nearly 1,400 laws passed by state legislatures between 2005 and 2012. Policies were coded as restrictive if they sought to bar immigrant access to public services, employment, state licenses, and/or housing and/or enlisted state or local law enforcement in efforts to identify unauthorized immigrants (Reich 2017). We include the measure of restrictive immigration policies as a time-varying, 1-year lagged measure. As a large proportion of state-years involve no restrictive policies passed, we present results of models using two operationalizations of this variable: (1) a dummy variable indicating any (vs. zero) restrictive policies passed last year; and (2) a categorical measure, indicating zero policies passed (reference) last year, one to four policies passed, and five or more policies passed. In supplementary analyses, we included a continuous measure reflecting total number of restrictive policies passed in the last year and a continuous measure reflecting cumulative number of restrictive policies passed, and results were substantively similar to the results in the main paper, albeit more modest in size.

Covariates

HRS respondents self-identify their race-ethnicity as White, Black, Hispanic/Latinx, and other. They also identify as US- or foreign-born. We combine data on race-ethnicity and immigration status to create a combined measure of race-ethnicity/nativity: US-born non-Latinx White; foreign-born non-Latinx White; US-born Latinx; and foreign-born Latinx. Unfortunately, sample sizes were too small to include Black or "other race" respondents. All models adjust for several time-varying, individual-level characteristics: age (years), marital status (1 = married; 0 = not married), and employment status (1 = employed; 0 = not employed). We were cautious in selecting individual-level controls, as we did not want to overcontrol for potential mediating mechanisms. In models estimating the links between county-level detainers and health risks, we adjust for county-level poverty (percent county population below the federal poverty line) and county Latinx population (percent county population identifying as "Hispanic"). In models estimating the links between restrictive state policies and health risks, we adjust for state-level poverty (percent state population below the federal poverty line) and state Latinx population (percent state population identifying as "Hispanic"). In descriptive analyses, we also report the proportion female, mean years of education, and mean years lived in the United States (for foreign-born respondents).

Analytic strategy

We first provide sample descriptive characteristics and show racial-ethnic/nativity variation in the outcomes using age-standardized means of physiological dysregulation and functional limitations. We then present descriptive plots showing temporal and geographic patterns in the county-level enforcement and state-level policy measures. Finally, we plot mean levels of exposure to cumulative county-level detainers and state-level restrictive policies, highlighting racial-ethnic/nativity variation.

To examine the associations between immigration enforcement and immigrant policy with health, we estimate three-way fixed-effects models. We merge data on county-level ICE detainers and state immigrant policy to geocoded HRS data. We estimate Poisson models, as both outcomes are count variables (supplementary analyses showed that conclusions based on ordinary least squares (OLS) models were substantively similar). We include the measures of county-level detainer rates and number of restrictive immigrant policies in separate models. The basic form of these models is below:

$$\begin{aligned} \mathrm{Y}_{igt} =&\beta_1\, \textit{enforcement or policy context}_{gt-1} * \textit{race} - \textit{ethnicity/nativity}_{\mathrm{i}} + \beta_2 \mathrm{X}_{\mathrm{it}} * \textit{race} - \textit{ethnicity/nativity}_{\mathrm{i}} \\ &+ \beta_3 \mathrm{X}_{gt} + \gamma_g * \textit{race} - \textit{ethnicity/nativity}_{\mathrm{i}} + \pi_{\mathrm{t}} * \textit{race} - \textit{ethnicity/nativity}_{\mathrm{i}} + \alpha_{\mathrm{i}} + \epsilon_{igt} \qquad (1) \end{aligned}$$

Here, individuals i are indexed by geography g and time t. In the county-level enforcement models, g corresponds to county and t corresponds to month-year. In the state-level policy models, g corresponds to state and t corresponds to year. y indicates individual-level outcome at time t. The county-level enforcement and state-level policy measures are lagged to $t - 1$. We model the outcomes as a function of the county- and state-level enforcement and policy exposures (separately) (β_1), time-varying individual-level covariates (β_2), time-varying county and state characteristics (β_3), and include place (γ), time (π), and individual (α) fixed effects. To allow for differential associations by race-ethnicity/nativity, we interact the enforcement and policy measures, time-varying individual-level characteristics, and the place and time fixed effects by race-ethnicity/nativity.

Including county and state fixed effects (γ) allows us to control for time-invariant unobserved between-county and between-state characteristics. As a result, we can more directly capture the impacts of county enforcement and state policy on health by measuring changes *within* counties and states, respectively. The time fixed effect (π) accounts for secular time trends (for example, federal health or immigration policy changes) that could confound results. We interact place- and time-based fixed effects with race-ethnicity/nativity to allow state and county characteristics and period-specific shocks to shape health differently by race-ethnicity/nativity.

We include individual fixed effects (α) to remove time-invariant person-level heterogeneity (e.g., variation age at migration, educational attainment, birth cohort, etc.), reducing concerns about selection and endogeneity. Our reporting of results focuses on the parameter β_1 in the above equations, which indicates how changes in county-level enforcement and state-level policy contexts relate to changes in the individual-level health outcomes differentially by race-ethnicity/nativity.

Results

Descriptive patterns

Sample descriptive statistics are in Table 1. Age-standardized means of physiological dysregulation and functional limitations by race-ethnicity/nativity are in figure 1. Both US- and foreign-born Latinx adults have higher levels of physiological dysregulation and more functional limitations than US-born and foreign-born non-Latinx White adults.

Figure 2 plots time and geographic trends for our key exposures. Panel A shows ICE detainers per foreign-born population across US states over time, with the red line indicating the national average. Though we include the measure of detainers as a cumulative, county-level variable in our multivariable models, we show each state's annual number of detainers per 100,000

Table 1. Descriptive individual-level characteristics.

	Non-Latinx US-born White	Non-Latinx foreign-born White	Latinx US-born	Latinx foreign-born
Age (years)	69.1	70.7	64.9	62.8
Employment status (1 = employed)	0.37	0.34	0.39	0.44
Marital status (1 = married)	0.62	0.63	0.57	0.64
Proportion female	0.58	0.58	0.58	0.59
Years of education	13.2	13.2	11.1	8.5
Years in the United States *(among immigrants)*	*N/A*	48.5	*N/A*	34.7
n	14,915	725	985	1,634

Note: Weighted descriptive statistics (means or proportions) for individual-level characteristics. Data source: Health and Retirement Study (2004–2016).

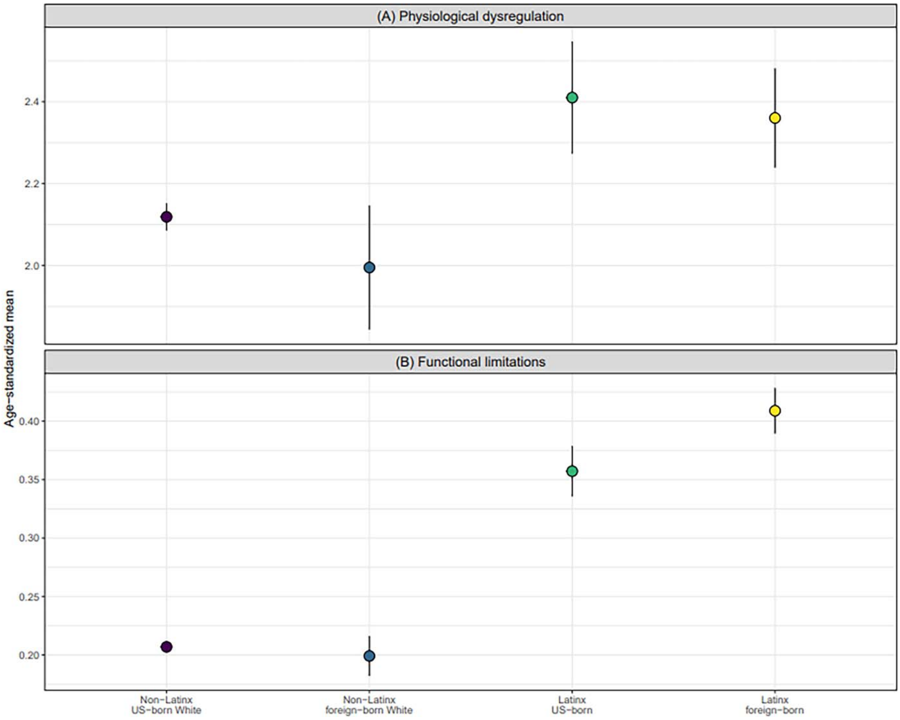

Figure 1. Physiological dysregulation and functional limitations by race-ethnicity/nativity. *Notes*: Age-standardized mean levels of physiological dysregulation (panel A) and functional limitations (panel B) by race-ethnicity/nativity. Data source: Health and Retirement Study (2004–2016).

foreign-born population in panel A for ease of visualization. Detainers increased rapidly starting around 2006 and peaked in 2011. Still, there is substantial heterogeneity in detainers across states over time and considerable within-state change in detainers over time. Panel C shows county-level variation in average detainers per foreign-born population across the period and reveals substantial substate level variation, with "hot spots" spattered in counties across most regions of the United States.

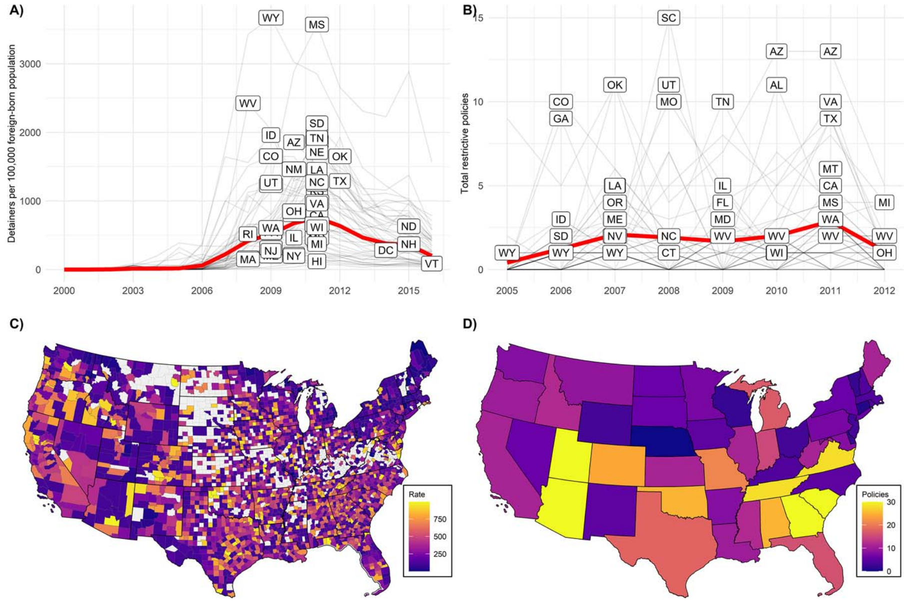

Figure 2. ICE detainers (panels A and C) and restrictive immigrant policies (panels B and D) over time and place. *Notes:* Panels A and C include data on ICE detainers from the Transactional Records Access Clearinghouse (TRAC). Panel A shows the number of detainers per 100 k foreign-born population for each US state and the District of Columbia (D.C.) over time (2002–2016). The thicker red line indicates the overall state average over time. Panel C displays the number of detainers per 100 k foreign-born population by US county over the period 2002–2016. Panels B and D show data on restrictive state immigrant policies from the Correlates of State Policy Project [based on coding by Reich (2017)] from 2005 to 2012. Panel B shows the number of restrictive immigrant policies passed by each state in each year. The thicker red line indicates the overall state average over time. Panel D shows the total number of restrictive immigrant policies passed by each state over the period 2005–2012.

Panel B of figure 2 shows trends in state-level restrictive immigrant policies over time. The y-axis indicates the number of restrictive policies passed by each state in each year, and the red line indicates the mean number of policies passed by states each year. Panel B reveals tremendous between- and within-state variation in immigrant policy contexts. Panel D shows the total number of restrictive immigrant policies passed by each state over the entire period (2005–2012) and shows substantial subnational variation.

Figure 3 shows mean levels of exposure to cumulative county-level detainers per 100,000 foreign-born population (panel A) and mean exposure to restrictive state immigrant policies (panel B) by race-ethnicity/nativity. Both US- and foreign-born Latinx adults have greater exposure to county-level detainers and restrictive state immigrant policies than US- and foreign-born White adults.

Three-way fixed-effects regression models

County-level detainers

Figure 4 presents the main findings from the three-way fixed-effects models that model the two outcomes as a function of cumulative exposure to county-level detainers per 100,000 foreign-born population. To ease interpretation, we show the percent change in outcomes associated with a 1 SD increase in cumulative detainers per 100,000 foreign-born population for each racial-ethnic/nativity group.

Results show that increases in cumulative exposure to detainers at the county-level increase health risks for foreign-born Latinx respondents, in particular. The strongest results are for

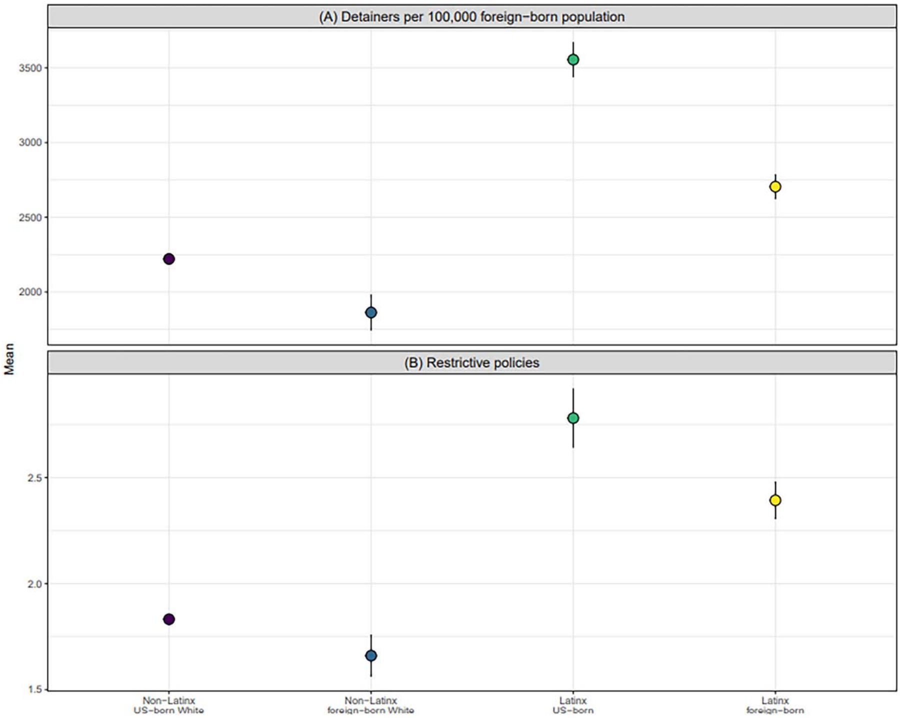

Figure 3. Exposure to county-level detainers and restrictive state immigrant policies by race-ethnicity/nativity. *Notes*: Mean levels of exposure to county-level detainers per 100 k foreign-born population (panel A) and state-level restrictive immigrant policies (panel B) by race-ethnicity/nativity. Data sources: Health and Retirement Study, Transactional Records Access Clearinghouse, and the Correlates of State Policy Project.

physiological dysregulation (in panel A), where a 1 SD increase in cumulative detainers per 100,000 county foreign-born population increases physiological dysregulation among foreign-born Latinx adults by an estimated 29.3 percent ($P = .012$). We find no evidence that cumulative detainers at the county level predict physiological dysregulation risks for the other groups. In panel B, results show that a 1 SD increase in cumulative detainers per 100,000 foreign-born population increases functional limitations among foreign-born Latinx adults by an estimated 9.8 percent (though the parameter is less precisely estimated); there is limited evidence of associations for other racial-ethnic/nativity groups.

We ran supplementary analyses using alternative county-level population denominators in our construction of the county-level detainer measures, including (1) the Latinx population and (2) the foreign-born Latinx population; we summarize results of these models in Appendix B. The top panel of Appendix B includes our main results with the total foreign-born population as the denominator for reference. The point estimates and substantive interpretations of results are relatively similar across alternative operationalizations of the county-level detainer measures, with three notable differences. First, using the foreign-born Latinx and overall Latinx populations as the denominators generally results in wider confidence intervals. Second, using these alternative denominators results in larger coefficient estimates for US-born Latinx adults compared to our main results. In this sense, the estimates for US-born Latinx adults presented in the main paper may be conservative. Finally, using the foreign-born Latinx population as the denominator results in a much larger coefficient estimate for the association between detainers and physiological dysregulation among foreign-born Latinx adults than the estimate in the main paper.

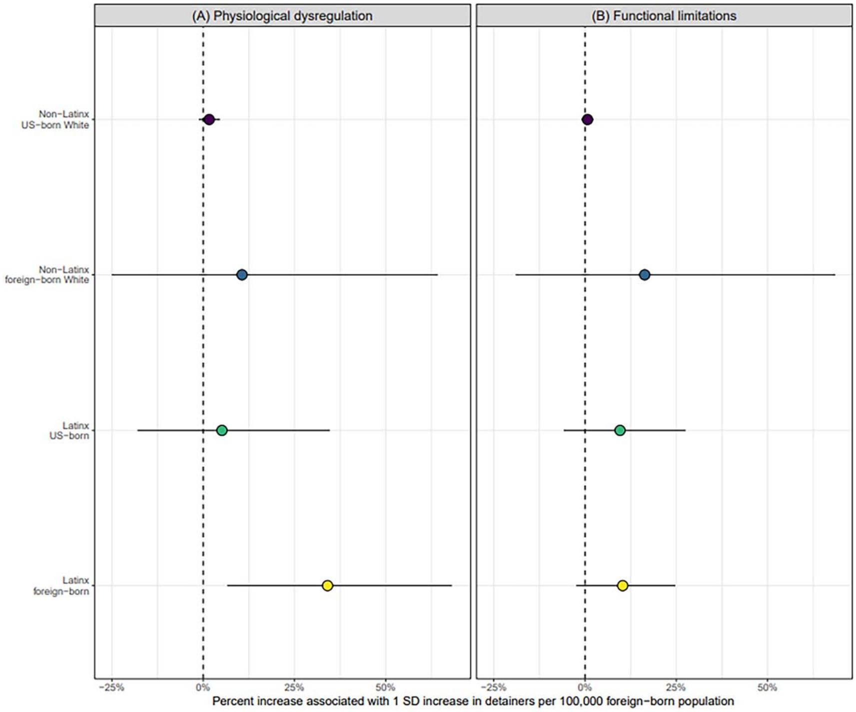

Figure 4. County-level detainers and health risks: three-way fixed-effects models. *Notes*: Results of three-way fixed-effects Poisson models regressing physiological dysregulation (panel A) and functional limitations (panel B) on cumulative county-level detainers per 100 k foreign-born population, allowing for differential associations by race-ethnicity/nativity. Estimates (with 95% confidence intervals) show percent increase in the outcome associated with a 1 SD increase in county-level detainers per 100 k foreign-born population. All models include individual, year, and county fixed effects; year and county fixed effects are interacted by race-ethnicity/nativity. Models adjust for age, employment status, marital status, percent of county population below the federal poverty line, and the percent of county population identifying as Hispanic. Standard errors clustered at individual level. Data sources: Health and Retirement Study (2004–2016) and Transactional Records Access Clearinghouse (2002–2016).

Restrictive state immigrant policies

Results of the three-way fixed-effects models regressing the outcomes on the state-level restrictive immigrant measures are summarized in figure 5 (physiological dysregulation in panel A and functional limitations in panel B). We operationalize restrictive state immigrant policy context in two ways: a dummy variable indicating any (vs. none) restrictive state immigrant policies passed; and a categorical measure indicating no policies passed (reference), one to four policies passed, and five or more policies passed. Appendix C shows results of analyses using continuous measures of total restrictive policies passed in the last year and total cumulative number of restrictive policies passed.

In panel A of figure 5, increases in restrictive state immigrant policies are linked to increased physiological dysregulation among White immigrants, in particular. Using the dichotomous measure of restrictive state policies, living in a state that passes any (vs. none) restrictive policies increases physiological dysregulation among White immigrants by an estimated 23.9 percent ($P = .028$). Using the categorical measure, results show that living in a state that passes one to four restrictive policies in the last year is associated with an estimated 22.5 percent increase in physiological dysregulation among White immigrants ($P = .043$); living in an especially restrictive state policy context (as indicated by five or more restrictive policies passed in the last year)

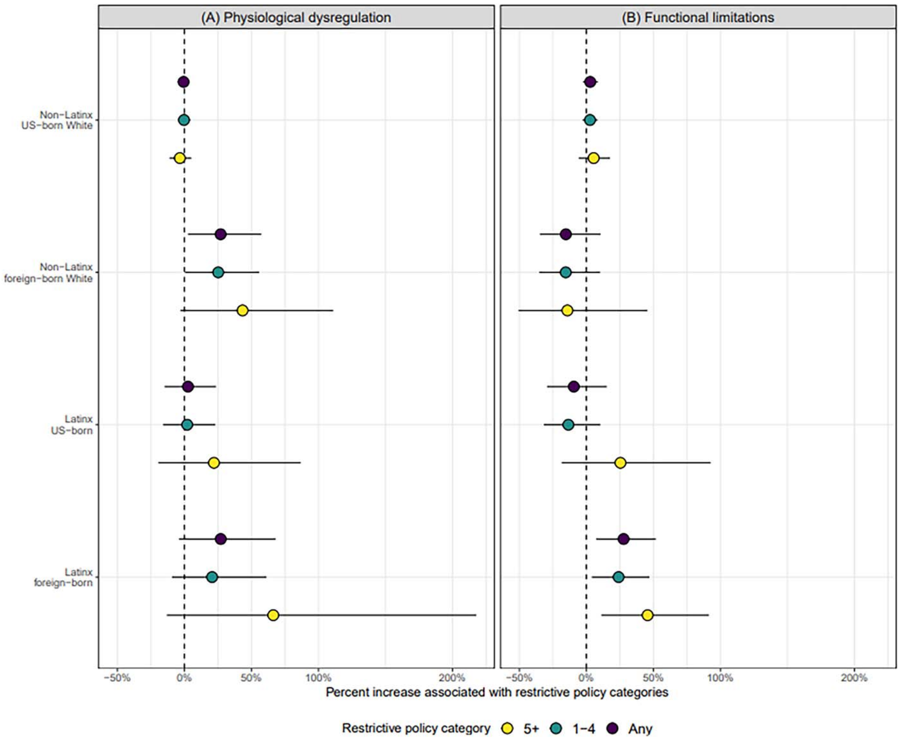

Figure 5. Restrictive state immigrant policies and health risks: three-way fixed-effects models. *Notes*: Results of three-way fixed-effects Poisson models regressing physiological dysregulation (panel A) and functional limitations (panel B) on state restrictive immigrant policies, allowing for differential associations by race-ethnicity/nativity. Estimates (with 95% confidence intervals) indicate percent increase in the outcome associated with (1) living in a state that passed any (vs. none) restrictive immigrant policies in the last year (indicated in purple); and (2) living in a state a state that passed 1–4 (indicated in green) or 5+ (indicated in yellow) restrictive immigrant policies in the last year (reference: state passed zero restrictive immigrant policies last year). All models include individual, year, and state fixed effects; year and state fixed effects are interacted by race-ethnicity/nativity. Models adjust for age, employment status, marital status, percent of state population below the federal poverty line, and the percent of state population identifying as Hispanic. Standard errors clustered at individual level. Data sources: Health and Retirement Study (2006–2014) and Correlates of State Policy Project (2005–2012).

is associated with an estimated 36.0 percent increase in physiological dysregulation ($P = .066$) among White immigrants. Results in Appendix C (which uses alternative operationalizations of the state policy context measure) are consistent with these findings; both the continuous and cumulative measures of restrictive state policy context are also associated with the physiological risks of White immigrants. The parameter estimates for the restrictive state policy measures are imprecise and not statistically significant for the other groups in the physiological dysregulation models, including foreign-born Latinx adults.

In panel B, results show that increasingly restrictive immigrant state policy contexts increase functional limitations among foreign-born Latinx adults. Using the dichotomous measure of restrictive state policy context, results show that foreign-born Latinx adults living in states that pass any (vs. none) restrictive immigrant policies experience an estimated 24.5 percent increase in functional limitations ($P = .005$). Using the categorical measure of state policy context, results indicate that, compared to living in a state that passes no restrictive policies in the last year, living in a state that passes one to four restrictive policies is associated with an estimated 21.5

percent increase in functional limitations among foreign-born Latinx adults ($P = .015$), while living in a state that passes five or more restrictive policies in the last year is associated with an estimated 37.6 percent increase in functional limitations among Latinx immigrants ($P = .008$). In Appendix C, both the continuous and cumulative measures of state policy context are associated with functional limitations risks among foreign-born Latinx adults. Results show no evidence that increases in restrictive state immigrant policies shape the functional limitations risks of US-born Latinx adults or US- or foreign-born White adults.

Discussion

In recent years, immigration scholars have emphasized the importance of structural and institutional factors in shaping pathways of immigrant incorporation (Amuedo-Dorantes et al. 2018; Jiménez et al. 2021; Lim and Paik 2022; Menjívar 2023). At the same time, health scholars have increasingly identified federal, state, and local social, political, and legal contexts as fundamental determinants of health and aging (Burgard et al. 2020; Montez 2020), including immigrant health (Dondero and Altman 2020; Hatzenbuehler et al. 2017; Perreira and Pedroza 2019; Philbin et al. 2018; Schut and Boen 2022). Bridging insights across these areas of study and drawing on the concept of *legal violence* (Menjívar and Abrego 2012), this study sought to answer two broad questions. First, how does legal violence manifest physiologically and physically, *in and on the body*? And second, who bears the *bodily scars* of this violence, in ways that generate and underlie inequities in health and aging? Critically, our use of directly observed, longitudinal markers of physiological and physical functioning allowed us to consider the bodily consequences of legal violence, with implications for a range of aging-related outcomes. By merging longitudinal individual-level and contextual data, our empirical analyses showed how over-time exposure to changing sociopolitical contexts differentially affected the health of aging US adults at the intersection of race-ethnicity and nativity.

Taken together, our findings provide evidence of the health harms experienced by immigrants living in increasingly hostile, unwelcoming, and restrictive immigrant policy contexts—what we call *bodily scars of legal violence*. Results from the three-way fixed-effects models showed that, as county-level enforcement increased and state immigrant policy contexts became more restrictive, immigrants experienced accelerated physiological and physical decline relative to US-born adults. The damaging consequences of enforcement and restrictive immigrant policy were concentrated among foreign-born adults; we found less consistent evidence that these forms of legal violence shaped the health risks of US-born adults. These findings are consistent with work showing that laws, policies, and institutional and bureaucratic processes construct immigration and legal status categories and hierarchies (Menjívar 2023; Menjívar and Abrego 2012) in ways that matter for health (Asad and Clair 2018); these laws, policies, and practices *give salience* to immigrant-native categories as they pattern health risks, designating and rendering some groups protected and deserving and others vulnerable and unworthy of collective protection and care (Bacong and Menjívar 2021).

Results highlight how legal violence—as a form of state-sanctioned and legitimized violence—is not only symbolic but very much *physical*. Exposure to legal violence leaves observable, population-level bodily damage among immigrants, in particular. While previous studies document the devastating *direct* physical harms posed state efforts to detain, cage, and deport immigrants (Erfani et al. 2020; Terp et al. 2021), results from our study offer new evidence the indirect but widespread damage—the *bodily scarring*—resulting from broader state efforts to surveil and exclude immigrants.

Importantly, our results also showed heterogeneous associations by race-ethnicity. The health consequences of enforcement were largely concentrated among foreign-born Latinx adults, in particular. In figure 4, results indicated that increases in county-level detainers were associated with accelerated physiological and functional decline among Latinx immigrants but not other groups, including White immigrants. Results of supplementary analyses in Appendix B using alternative population denominators for the county-level enforcement measure produced largely similar results, though we did find some evidence that county-level detainers may also have associations with the functional limitations risks of US-born Latinx adults, as well. We take these results to reflect the highly racialized nature of enforcement in the United States, where Latinx individuals have been primary targets of surveillance, detention, and deportation efforts (Armenta 2017). Our descriptive analyses in figure 3 reflected this, showing that both US- and foreign-born Latinx adults had higher exposure to county-level enforcement than White adults, including White immigrants.

It is worth noting that, in our data, the foreign-born Latinx population had been in the United States, on average, for more than three decades (34.7 years). While the HRS do not collect data on legal status, few of the Latinx immigrants in the HRS were newly arrived immigrants and most likely held legal status in the United States. While these older Latinx immigrants may not experience the same direct risks of detention or deportation as unauthorized or more recently arrived immigrants, their *racialized legal status* (Asad and Clair 2018) likely subjected them to the health harms of enforcement-induced stress, fear, and stigmatization in ways that accelerated health decline. Older Latinx immigrants' racialized proximity to undocumented immigrants may have exposed them to stigmatization and criminalization as a result of heightened enforcement (Asad and Clair 2018; Flores and Schachter 2018); they may have feared or worried about the surveillance, detention, and deportation of loved ones or community members (Asad 2020; Cervantes and Menjívar 2020; Rodriguez et al. 2017). Despite (likely) holding legal status in the United States, that status was liminal (Abrego and Lakhani 2015) in the sense they were vulnerable to the damaging consequences of enforcement and restrictive policies.

In the main results, we did not find evidence that county-level enforcement was associated with the health risks of US-born Latinx adults, despite this group having relatively high levels of exposure to local enforcement. It is possible that this group did not experience the same sense of stress, fear, worry, stigmatization, or criminalization in response to heightened enforcement as Latinx immigrants. Indeed, research find that, compared to Latinx immigrants, US-born Latinx adults report lower levels of enforcement-related fear and worry (Asad 2020; Moslimani 2022). Being US-born may confer protections against the health harms associated with enforcement. Still, we want to caution that our main results may be conservative. In Appendix B, we found that models using alternative measures of county-level enforcement detainers with different population denominators yielded larger coefficient estimates for US-born Latinx adults (alongside wider confidence intervals). These results highlight the need for more research on the effects of immigration enforcement for US-born Latinx adults.

Results from the state immigrant policy models in figure 5 showed that restrictive immigrant policy contexts were associated with increased health risks among both White and Latinx immigrants. A large body of research highlights how racist and xenophobic backlash to increased immigration from Mexico and Central America can increase support for restrictive state immigrant policies among White people, in particular (Avery, Fine, and Márquez 2017; Ybarra et al. 2016), suggesting that these anti-immigrant policies may be motivated by a particular White racist animus toward Latinx immigrants. Still, our results indicate that the health harms of these policies are not necessarily limited to Latinx immigrants. To the extent that these restrictive policies limit both Latinx *and* White immigrants' access to health-promoting goods or services, or increase feelings of immigration-related worry, stress, or stigmatization, these policies can have broad impacts on the health immigrants across race-ethnicity. Still, our sample of White immigrants is relatively small, so results for this group should be interpreted cautiously.

There are limitations to this study that can guide future research. First, despite the many strengths of the HRS data, small samples imposed several limitations. We were unable to simultaneously consider how county- and state-level exposures jointly pattern health risks, how specific state-level immigrant policies shaped health risks, or how state policies may have moderated one another. We were also unable to consider differential associations by country of origin, immigration cohort, gender, age, and other dimensions of inequality. The HRS also does not collect data on legal status, so we were unable to assess heterogeneity by legal status. The samples of Black immigrants and Asian respondents in the HRS were too small to include in this study, underscoring the need for more high-quality data on the health and well-being of aging Black and Asian immigrants, in particular. Furthermore, the number of foreign-born White respondents was comparatively small, so findings regarding this group should be interpreted cautiously. Future research might also consider how the differential distribution of groups across the United States may shape the associations we documented here.

There are also limitations to our analytic approach. We cannot rule out the role of selection (including mortality selection and selective migration) in affecting our estimates. While we focused on the health consequences of changes in immigration enforcement and state immigrant policies, there may be other political, social, and economic changes that occurred over the period that impacted our findings. Additionally, while our use of longitudinal data allowed us to lag the exposures and assess how changes in the exposures between HRS waves related to changes in the outcomes, we did not have sufficient data to test for longer lags.

While not a limitation necessarily, we do not identify the mechanisms underlying our findings. There are likely multiple mechanisms undergirding our results, including changes in psychosocial stress and benefits and health care utilization (see Philbin et al. 2018 for a review). These varied mechanisms may help to explain the different results we observe across the two outcomes. For example, it is possible that the composite biomarker outcome was more acutely sensitive to changes in the sociopolitical environment than the functional limitations outcome, which may require more years of data to observe.

Altogether, this study provides new evidence of the role of immigration-related laws, policies, and institutional practices in shaping population patterns of health and aging, including nativity-based and racialized inequities. Despite a longstanding immigrant health advantage in the United States (Hummer and Hayward 2015; Lariscy et al. 2015), our results highlight the precarity of this advantage, especially for Latinx immigrants. State efforts to surveil, cage, and exclude immigrants have toxic physiological and physical consequences for foreign-born adults in ways that have implications for future patterns of health and longevity. We also note that our study examined a particular historical context defined by rapid increases in anti-immigrant policy, but we ended our period of study in 2016—a federal election year that saw intense and heightened anti-immigrant public and political discourse. We speculate that these policies and discourses—along with the further increases in punitive immigrant policies post-2016—likely amplified the patterns documented here. Findings from this study point to the urgent need for humane, inclusive, and accommodating immigration and immigrant policies—including those that extend social welfare benefits and access to housing, employment, education, and other critical resources—which hold promise for redressing health inequities and promoting health justice (Schut and Boen 2022; Venkataramani et al. 2017).

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Supplementary material

Supplementary material is available at *Social Forces* online.

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Conflicts of interest: None declared.

Data availability

This study uses publicly available data from the Health and Retirement Study (HRS), as well as restricted HRS data including state and county identifiers and biomarker data, which are available with a restricted data use agreement. Data on state immigrant policies are publicly available via the Correlates of State Policy Project. Data on immigration enforcement are from the Transactional Records Access Clearinghouse and available to researchers under a data use agreement.

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