THE OVERLOOKED EFFECTS OF MASS INCARCERATION, DATA CONSTRAINTS,
AND LEGAL STATUS ON IMMIGRANT AND INMATE HEALTH

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Dissertation

Submitted to the Faculty of the

Graduate School of Vanderbilt University

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

in

Sociology

February 28, 2022

Nashville, Tennessee

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# ACKNOWLEDGMENTS

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# CHAPTER 1

## Introduction

Much of the current literature regarding immigrant health interrogates the finding that foreign-born individuals tend to exhibit an advantage relative to their U.S.-born counterparts (Cunningham, Ruben, and Venkat Narayan 2008; Riosmena, Kuhn, and Jochem 2017; Singh and Siapush 2002). The resultant notion of an immigrant health advantage is based upon the assumption that because immigrants are disadvantaged in terms of socioeconomic status, it is paradoxical that they have better health outcomes relative to the native-born population (Hummer et al. 2007). Yet evidence of a health advantage predominantly stems from the comparison of foreign- versus native-born individuals, to the neglect of other stratifying aspects of the immigrant experience beyond nativity.

Moreover, the focus on solving the "paradox" of immigrant health diverts attention away from social and political factors that contribute to disparities in health between various immigrant populations (Viruell-Fuentes, Miranda, and Abdulrahim 2012). More specifically, research on the immigrant health advantage is hindered by its broad neglect of two critical factors that affect health: incarceration and legal status. Little is known about how these two systems of stratification, which impact social and civic integration, socioeconomic opportunities, and health risks (Torres and Young 2016; Wakefield and Uggen 2010), combine to influence health outcomes. In this dissertation, I propose that the criminal legal and immigrant legal status systems constitute two countervailing mechanisms in the production of immigrant health.

Roughly 45 million individuals in the U.S. are foreign-born, comprising nearly 14 percent of the country's population (U.S. Census Bureau n.d.a). Of these 45 million immigrants, 51.6 percent are naturalized U.S. citizens. This means that nearly half of the foreign-born population are characterized by liminal legal statuses ranging from legal permanent or temporary residence to undocumented. Being a noncitizen immigrant is accompanied by social, civil, economic, and health burdens because it does not provide the stability and certainty of citizenship, nor equal access to health-promoting resources (Campbell et al. 2013; Pastor and Scoggins 2012; Torres and Young 2016). For example, compared to naturalized citizens, undocumented immigrants exhibit the highest rates of lacking health insurance, but even legal permanent residents display a significant disadvantage in health insurance coverage (Goldman, Smith, and Sood 2005).

To complicate matters, various visa categories exist within the temporary and permanent residence statuses, such as family reunification, employment, and refugee visas. Each of these visa categories are associated with immigrants' prior life chances and accessible resources (Morey et al. 2020). In this way, the immigrant population is systematically stratified beyond the commonly-studied nativity binary. It is imperative to consider patterns in immigrant health utilizing a more nuanced conceptualization of legal status in order to better understand to whom the immigrant health advantage does—and does not—extend.

In addition to the inadequate attention to legal status, the system of mass incarceration has been largely overlooked in immigrant health research (Rumbaut et al. 2006). While immigration literature examines the integration of newcomers to the disregard of criminal outcomes, studies of punishment and inequality investigate stratification by race, socioeconomic status, and gender but largely overlook factors such as nativity and legal status (Rumbaut et al.

2006). In part, this divide is a theoretical one and can be attributed to the disconnect between immigrant and punishment literature. However, data limitations have also precluded the inclusion of incarcerated individuals in the study of immigrant health given that most national datasets exclude institutionalized individuals.

The reliance on large, national surveys that exclude prisoners obscures social facts, particularly social facts related to racial stratification and progress (Pettit 2012). This is a potentially critical oversight because the U.S. criminal legal system is characterized by its differential treatment based on citizenship status (Baumgartner et al. 2018; Ewing et al. 2015) in addition to race/ethnicity (Patterson and Dagadu 2015). Incarceration is also linked to adverse physical and mental health outcomes (Wilper et al. 2009), rendering it an important countervailing mechanism that may contribute to immigrant ill-health. Accordingly, incarcerated immigrants are doubly marginalized, by research and methods of data collection that push the experiences of incarcerated individuals to the periphery, as well as by broader U.S. society that criminalizes, racializes, and socially excludes immigrants. Therefore, extant studies on immigrant health may not fully capture the health of all immigrants, as the current sociolegal landscape of mass incarceration coupled with the racialized criminalization of immigrants may be generating unique challenges for individuals caught at the intersection of these systems of stratification.

This dissertation addresses several notable gaps in the extant immigrant health literature, both based on data limitations and conceptual oversights. The present research shifts the focus of immigrant health research from individual culture-based frameworks to theorize that interconnected structural forces generate variation and deterioration in immigrant health. Furthermore, this work bridges immigration and punishment literature to show that, in addition

to race/ethnicity, incarceration also creates health disparities by nativity. Lastly, existing evidence of an immigrant health advantage largely stems from samples of the non-institutionalized population as well as from cross-sectional data. The present research contributes to the literature by utilizing surveys of both the institutionalized and non-institutionalized population in chapter one, and longitudinal data in chapters two and three. By doing so, this work advances understandings of the roles of the intertwined criminal legal and immigrant legal status systems in the production of nativity differences in health.

In the first empirical chapter, I evaluate the immigrant health advantage when a population historically excluded from "nationally representative" datasets—the incarcerated—are included in analyses. According to the notion of an immigrant health advantage, we would expect incarcerated immigrants to exhibit better health relative to their incarcerated native-born counterparts. Yet, results indicate that evidence of an immigrant health advantage is generally weaker among prisoners than among the non-incarcerated population. These findings suggest that mass incarceration may be systematically undermining the health of immigrants caught in its domain.

In the second and third empirical chapters, I emphasize legal status as a dynamic characteristic that shapes immigrant health over the life course. In the second chapter, I conceptualize legal status as a multidimensional characteristic, rather than as a binary trait as is common in extant work. Specifically, I assess if three dimensions of legal status—initial authorization classification, legal permanent residence (LPR) admission category, and citizenship—predict odds of reporting a chronic condition among immigrants over time. Findings reveal LPR admission category and citizenship as the components of legal status most

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strongly and consistently predictive of health over time. These results demonstrate that legal status is better conceptualized as dynamic and multifaceted instead of as static or binary.

In the final empirical chapter, I consider how social forces post-migration may be influencing immigrant mental health. In particular, I examine how the mental health trajectories of immigrants differ by visa category, most notably refugee status, and gender. I find that refugees in the total sample experience increased odds of mental illness compared to family preference immigrants at baseline, but only refugee women are at risk of mental ill-health over time. Stressors associated with the refugee experience likely contribute to refugees' elevated risk of mental illness initially, but social factors post-migration likely account for refugee women's continual disadvantage. Factors such as lower socioeconomic status and levels of English language proficiency, as well as heightened exposure to sexual- and gender-based violence may contribute to refugee women's higher levels of mental illness. These findings also point to the need for better and more social and health resources to be made available for refugee women.

Each of these chapters pushes the boundaries of immigrant health research to consider the experiences of individuals that are missed in existing conceptualizations of the foreign-born population in order to provide a more accurate portrayal of the health patterns and needs of immigrants in the U.S. Overall, findings of a weakened health advantage among incarcerated immigrants, authorized noncitizens, and refugee women challenges the notion of a universal immigrant health advantage. In summary, this dissertation illustrates the power of sociolegal forces to stratify population health along socially-determined lines.

**CHAPTER 2**

**Does the Immigrant Health Advantage Extend to Incarcerated Immigrants? The Inclusion**

**of Prisoners in the Study of Immigrant Health**


Prevailing research on immigrant health tends to focus on explaining immigrants',

particularly Latine[1] immigrants', superior health when compared to their native-born American

counterparts. However, these studies rely on datasets that exclude institutionalized populations,

such as prisoners. Extant national estimates of immigrant health do not account for incarcerated

immigrants, including the 83,573 non-U.S. citizens and unreported number of foreign-born

naturalized citizens under federal jurisdiction or in state custody in 2016 (U.S. Department of

Justice 2019). Evidence that foreign-born individuals are significantly less likely to commit

crime (Sampson 2008) and experience incarceration (Rumbaut et al. 2006) than native-born

individuals may motivate the inattention to incarcerated persons in the study of immigrant health.

For example, in 2016, federal and state officials incarcerated noncitizens and citizens at a rate of

371 and 458 per 100,000, respectively[2]. Nevertheless, structural forces such as mass

incarceration and the racialized criminalization of immigrants may be producing health

inequalities by nativity in unexplored ways.

Systems of incarceration (Bobo and Thompson 2006; Wakefield and Uggen 2010) and

immigration (Asad and Clair 2018; Sáenz and Manges Douglas 2015) reflect prevailing U.S.

racial/ethnic stratification processes. More specifically, the criminalization of racial/ethnic

minorities (Alexander 2011; Baumgartner, Epp, and Shoub 2018) and immigrants (Ewing,

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[1] I use the term *Latine* instead of the similarly gender-inclusive term *Latinx* given its more straightforward
pronunciation in the Spanish language.
[2] Data sources: Carson 2018; U.S. Census Bureau n.d.b.; U.S. Department of Justice 2019. Calculations by author.

Martinez, and Rumbaut 2015; Provine and Doty 2011; Waters and Kasinitz 2015) permeates our nation's laws and their differential enforcement. This criminalization is evident in the disproportionate incarceration of individuals by race/ethnicity, with those racialized as Latine black, non-Latine black, and Latine white experiencing significantly greater odds of being incarcerated than non-Latine whites (Patterson and Dagadu 2015). In addition, immigrants encounter legal policies uniquely designed to target and punish noncitizens (Baumgartner et al. 2018; Ewing et al. 2015), which reify the existing racial/ethnic social order through the oppression of a population that is primarily racialized as nonwhite (Chacón and Coutin 2018). Yet, despite their racialized marginalization, research has not examined the health of incarcerated immigrants; therefore, the extent to which the criminal legal system shapes patterns of morbidity among this population are currently unknown.

The present study links divergent areas of sociological research in immigration and punishment studies by examining the health of both non-incarcerated and incarcerated individuals by nativity, with attention to race/ethnicity and citizenship. Specifically, I create a novel dataset by combining the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates to address three questions. Is there evidence of an immigrant health advantage among incarcerated individuals? How does the inclusion of incarcerated individuals in the analysis of immigrant health alter patterns of nativity disparities in health? What roles do race/ethnicity and citizenship play in the relationship between incarceration status, nativity, and health? By addressing each of these questions, I show the differences and similarities of conclusions reached based on incomplete and (more) complete data in the study of immigrant health. I also theorize the criminal legal system as one social force that may be contributing to inequalities in health by nativity, race/ethnicity, and citizenship. For the purposes of this study,

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immigrants refer to all foreign-born individuals; thus, I use the terms "foreign-born" and "immigrant" synonymously. In addition, I refer to "incarcerated individuals" and "prisoners" interchangeably.

This research extends upon existing literature in at least three ways. First, although prior studies highlight cultural mechanisms that contribute to an immigrant health advantage, structural factors that produce variation and deterioration in the health of foreign-born individuals are underexplored (Viruell-Fuentes et al. 2012). In contrast, the present study centers the criminal legal system, through mass incarceration and the racialized criminalization of immigrants, as a potential countervailing mechanism in the production of immigrant health and well-being. By doing so, I address another limitation in extant research—the disjunction of immigration and punishment research. Instead, I highlight how the criminal legal system impinges upon the experiences of immigrants, as it disproportionately surveils, punishes, isolates—and thereby removes from public view—foreign-born individuals, particularly those who are racialized as black or Latine. Lastly, social science research relies on datasets that omit institutionalized individuals. With the use of newly available data in conjunction with a widely used survey, though, I show that the exclusion of prisoners from assessments of immigrant health conceals disparities and impedes the formation of social facts. Findings reveal that the immigrant health advantage is weaker among prisoners than among the general population and contingent upon race/ethnicity, citizenship, and health outcome. Consequently, the criminal legal system may be presenting distinctive challenges to the health of immigrants entangled in its authority.

2.1    Background

2.1.1  The Immigrant Health Advantage

Research indicates that non-incarcerated immigrant populations tend to experience a

health advantage compared to native-born Americans, even after controlling for relevant factors

like age, gender, and socioeconomic status (Cunningham et al. 2008; Riosmena et al. 2017;

Singh and Siahpush 2002). This pattern has variably been referred to as the immigrant health

advantage, epidemiological paradox, and healthy immigrant effect. This health advantage

extends to multiple outcomes such as mortality, chronic conditions, overweight/obesity, and

mental health (Cunningham et al. 2008; Hummer et al. 2007; Singh and Siahpush 2002).

Differentials in health between native- and foreign-born populations are greatest for immigrants

racialized as black or Latine (Engelman and Ye 2019; Singh and Miller 2004; Singh and

Siahpush 2002). For instance, compared to native-born whites of equivalent socioeconomic

status, foreign-born blacks, Latines, and whites have, respectively, 48, 45, and 16 percent lower

mortality risks (Singh and Siahpush 2002). Scholars often postulate that the immigrant health

advantage is produced by overlapping, individual- or community-level mechanisms such as the

self-selection of healthier persons into migration (Landale, Gorman, and Oropesa 2006;

Riosmena, Wong, and Palloni 2013; Riosmena et al. 2017) and cultural factors such as social

support embedded in migrant networks (Eschbach et al. 2004; Jasso et al. 2004; Riosmena et al.

2017).

Missing from most extant accounts of immigrant health are macro-level theories

elucidating why the immigrant health advantage does not extend to all health outcomes, all

foreign-born populations, or over time. Many foreign-born groups exhibit higher rates of daily

activity limitations, metabolic dysregulation, inflammatory risk, diabetes, some infections,

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occupational injuries, and poor self-rated health relative to the native-born (Angel et al. 2001; Boen and Hummer 2019; Cunningham et al. 2008; Jasso et al. 2004). For example, the immigrant health advantage in physical limitations does not extend to those who identify as both black and Latine (Elo, Mehta, and Huang 2011). Additionally, noncitizen immigrants are less likely to have health insurance (Goldman, Smith, and Sood 2005) and are more vulnerable to poor health (Campbell et al. 2012) relative to citizens. The immigrant health advantage also wanes over the life course, as immigrants' risk of ill-health increases the longer they reside in the U.S. (Abraído-Lanza, Echeverría, and Flórez 2016; Cunningham et al. 2008; Singh and Siahpush 2002), although this decline in well-being does not extend to self-rated health (Hamilton, Palermo, and Green 2015; Lu et al. 2017).

Thus, research demonstrates that, despite strong and enduring associations between nativity and health, the immigrant health advantage does not uniformly apply to all health outcomes or foreign-born populations. Forces beyond the individual or community likely produce these observed divergences in well-being. I propose that the criminal legal system, through mass incarceration and the racialized criminalization of immigrants, is one powerful structural force that creates further disparities in immigrant health. The present study tests this hypothesis and examines if incarcerated immigrants, stratified by race/ethnicity and citizenship, constitute another population to which the immigrant health advantage does not extend.

2.1.2   Immigrants and Incarceration

The criminal legal system constitutes one critical countervailing mechanism that may contribute to immigrant ill-health, as it has become increasingly intertwined and hard-lined with immigration matters. Until 2021 (The White House 2021), the U.S. government used the term

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"alien" to refer to noncitizen immigrants and "criminal alien" to ambiguously refer to noncitizens who were accused of a crime; "criminal aliens" therefore included undocumented and documented immigrants and those who were incarcerated or non-incarcerated, or who had already served time (Kandel 2016). The "criminal alien" label can lead to incarceration and/or deportation, depending on the noncitizen immigrant's legal status, the alleged crime committed, the availability of government resources, and the discretion of the Department of Homeland Security (DHS) (Kandel 2016). Under the direction of DHS, Immigration and Customs Enforcement (ICE) screens everyone seized by most law enforcement agencies and identifies potential removable noncitizens (Kandel 2016). DHS prioritizes which noncitizens should be deported, including those deemed as threats to national security, border security, and public safety (priority 1), those accused of misdemeanors and new immigration violators (priority 2), and those who received final orders of removal on or after January 1, 2014 (priority 3) (Kandel 2016). Therefore, in theory, most undocumented immigrants are eligible for deportation regardless of if or what specific crime was perpetrated, but documented immigrants are hypothetically only deported for serious, high priority crimes (Kandel 2016).

Due to increasingly restrictive immigration policies, though, the distinction between citizens/noncitizens has become more critical for immigrant legal outcomes than the documented/undocumented divide (Coutin 2011). The gathering and dissemination of inmate data gathered by the federal government reflects this emphasis; the U.S. Department of Justice makes information regarding inmate citizenship status, but not nativity or immigrant legal status, readily available (e.g., Federal Bureau of Prisoners n.d.). If noncitizens are convicted of a crime but not immediately evaluated as a priority for removal, they are incarcerated. However, incarceration and deportation are not mutually exclusive experiences; for example, from 2011 to

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2016, DHS deported 95 percent of noncitizens incarcerated in federal prisons after they

completed their prison term (U.S. Government Accountability Office 2018).

Noncitizen immigrants comprise approximately 4 percent of the state prison population

and 20 percent of the federal prison population (Kandel 2016; U.S. GAO 2018). This

overrepresentation of noncitizen immigrants in federal prison is due to incomplete data at the

state level[3] as well as immigration offenses solely being prosecuted at the federal level (Kandel

2016; U.S. GAO 2018). In 2016, noncitizen immigrants in state prisons were most likely to be

convicted of homicide, drug, sex, and assault offenses (U.S. GAO 2018). In contrast, 66 percent

of noncitizen immigrants in federal prisons were convicted immigration related offenses,

primarily (91 percent) unauthorized reentry into the U.S. (U.S. GAO 2018). Another 25 percent

of noncitizen immigrants in federal prison were convicted of drug crimes (U.S. GAO 2018).

Although state and federal jurisdictions are generally separate, some criminal acts, such as drug

offenses, can be prosecuted under the applicable state or federal law (Butcher and Piehl 2000).

Whether an individual is tried by state or federal officials can result in divergent consequences,

including much longer sentences at the federal level (Butcher and Piehl 2000). If the health of

individuals systematically differs based on the type of crime for which they are convicted, then

this sorting of individuals into state and federal prisons based on crime type may simply reflect

existing differences. New disparities in health among prisoners may also emerge if the living

conditions and available resources vary by prison type.

Furthermore, noncitizen immigrants face particularly harsh treatment under the law.

Many of the crime-related protections in the U.S. Constitution also apply to noncitizens,

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[3] Data on noncitizens at the state level is incomplete because (1) states use varying definitions of "noncitizen" and (2) some states do not report data regarding the citizenship of inmates to the federal government.

including the right to an attorney, avoidance of self-incrimination, and protection against unlawful search and seizure by law enforcement authorities (Chacón 2010; Eagly 2010). Regardless of these protections, the reality of the criminal legal system as it applies to noncitizens is very different. While noncitizens are afforded these constitutional rights for criminal offenses, immigration offenses are civil laws and therefore not covered by the protections and evidentiary requirements associated with criminal law (Chacón 2010; Eagly 2010). Criminal and immigration laws have converged in recent decades, a process known as "crimmigration" (Stumpf 2006). As a result, officials can apprehend noncitizens due to a suspected immigrant violation, gather evidence that is not subject to search and seizure restrictions, and then charge them with a crime based on what they find (Chacón 2010). The opposite can also occur, with individuals charged with a criminal offense later being charged with an immigration offense (Eagly 2010). Because of crimmigration, criminal prosecutions of immigration violations are the most common type of case in federal court (Eagly 2010).

The U.S. criminal legal system itself is also devised to treat noncitizens more severely than citizens, which includes a category of felonies and punishments that only apply to immigrants (Baumgartner et al. 2018; Ewing et al. 2015). For example, a category of offenses known as "aggravated felonies" carry particularly harsh consequences for noncitizen immigrants such as deportation without a removal hearing and permanent inadmissibility into the U.S. (American Immigration Council 2016). Included in this category of crimes are abundant nonviolent misdemeanors like filing a false tax return and failing to appear in court (American Immigration Council 2016). Noncitizens are also more likely to be transferred into federal jurisdiction for a minor role in a drug conspiracy offense compared to citizens (Scalia 1996), which is associated with more serious penalties.

This severe treatment under the law may create disparities in health for noncitizen immigrants who experience incarceration relative to those who do not, as imprisonment can erode mental and physical health and longevity. It is unclear to what extent the criminal legal system shapes immigrant health, though, given the disconnect between immigration and punishment research. Immigration literature rarely considers criminal outcomes, while punishment literature simultaneously marginalizes immigration-related factors (Rumbaut et al. 2006). Moreover, the U.S. Department of Justice's focus on citizenship differences in incarceration to the neglect of nativity differences obscures the experiences of imprisoned immigrants who are naturalized U.S. citizens. The present study therefore evaluates the well-being of those overlooked in extant research—imprisoned immigrants, both U.S. citizens and noncitizens—who may face unique health challenges due to their social position at the intersection of incarceration and immigration systems.

## 2.1.3   Incarceration and Health

The expansion of the criminal legal system in the U.S. isolates a substantial portion of the population in the carceral state, where inmates are systematically excluded from civil participation, employment opportunities, housing, public benefits, and even national datasets (Alexander 2011; Olivares et al. 1996; Pager 2003; Pettit 2012; Western 2002). Given the expansiveness of the criminal legal system, it has enormous potential in shaping the lives of those marked by the carceral state across numerous domains (Braman 2007; Pager 2003; Wacquant 2001), including health. In particular, the criminal legal system has the power to alleviate or exacerbate physical and mental health disparities in the population (Dumont et al.

2012; Sugie and Turney 2017; Thomas and Torrone 2008; Weidner and Schultz 2020; Wildeman 2012).

On the one hand, jails and prisons provide health care, which many incarcerated individuals do not have access to in their home communities (Binswanger et al. 2012). Consequently, there is evidence that imprisonment can benefit health in the short-term (Patterson 2010; Wildeman and Wang 2017), although the effects may vary by race/ethnicity. For example, a study of the Texas prison population found that the age-standardized prevalence of diabetes among blacks was modestly lower compared to the non-institutionalized black population (Harzke et al. 2010). In contrast, the same study in Texas also found that the age-standardized prevalence of diabetes among Latine inmates was slightly higher than that of the general Latine population (Harzke et al. 2010). There is further evidence that incarceration decreases the death rates of young black men, indicating that it can be beneficial for short-term mortality (Patterson 2010; Wildeman 2012). That is, black men are less likely to die in prison than outside of it; the opposite is true for whites and Latines (Dumont et al. 2013; Mumola 2007; Spaulding et al. 2011).

One explanation that may partially explain the pattern experienced by black men is that incarceration temporarily eliminates risk of transportation- and firearm-related mortality (Patterson 2010; Spaulding et al. 2011), which are the leading causes of death for young black men (CDC 2017). Moreover, since incarceration affects a broader population of black individuals, it is likely that a higher proportion of healthy blacks experience imprisonment relative to whites (Dumont et al. 2013). Conversely, with much lower incarceration rates, imprisoned whites are likely less representative of the general, and overall healthier, white population (Dumont et al. 2013). It may also be the case that health care access and/or quality for

non-incarcerated blacks is so poor that the receipt of health care within prisons narrows the health gap between those with low rates of insurance coverage (e.g., blacks) and those with comparatively high rates of insurance coverage (e.g., whites) (Patterson 2010). Regardless of the exact mechanisms, the reduced racial/ethnic health disparities among prisoners compared to the general public likely speaks more to the social conditions of individuals on the outside than they do any positive influence of incarceration on health (Dumont et al. 2013; Patterson 2010).

In contrast, incarcerated individuals are exposed to significant harms upon confinement. Several epidemiologic studies demonstrate that inmates experience higher rates of chronic conditions (Binswanger, Krueger, and Steiner 2009; Wilper et al. 2009), mental illnesses (Wilper et al. 2009), substance abuse disorders (Bronson et al. 2017), and infectious diseases (Hammett 2006; Solomon et al. 2004) compared to the non-incarcerated population, even after controlling for potentially confounding factors such as age and education. Despite the constitutionally-protected provision of health care in criminal legal facilities, there are often substantial barriers to utilization such as financial burdens in accessing the for-profit prison health services, treatment interruption due to transfers, and insufficient health support networks (Wilper et al. 2009). Failure to receive treatment for serious illnesses while incarcerated is therefore another pathway that erodes incarcerated individuals' health while imprisoned (Wilper et al. 2009).

Even so, the adverse effects of imprisonment on physical and mental health are typically strongest after release (Wildeman and Wang 2017). For example, a study of New York State parolees establishes that each year spent behind bars leads to a two-year reduction in life expectancy at time of release (Patterson 2013). Additionally, incarceration significantly increases the likelihood of experiencing severe health limitations (Schnittker and John 2007) and

depression (Esposito et al. 2017) and has a deteriorating effect on physical health functioning (Massoglia 2008).

Taken together, research establishes that imprisonment can promote well-being in the short-term through the provision of health care while the experience of incarceration itself can erode health over time. However, nationally representative health datasets do not include prisoners and rarely include questions related to prior incarceration (Ahalt et al. 2012). Studies therefore have not examined if imprisonment is associated with reduced health disparities by nativity or, conversely, if incarceration predicts worse health among immigrants. In this paper, I investigate how mass incarceration and the racialized criminalization of immigrants may affect accounts of immigrant health and explanations for the immigrant health advantage.

## 2.1.4 The Present Study

The present study explores the role of the criminal legal system in the production of nativity differences in health. By doing so, I address several limitations of prior scholarship regarding the health of immigrants. First, this study shifts the focus of immigrant health research from individual culture-based frameworks to theorize that interconnected structural forces, such as mass incarceration, racial/ethnic stratification, and citizenship status, generate variation and deterioration in immigrant health. In contrast, researchers regularly attempt to unravel the "paradox" of immigrant health to the neglect of illuminating the structural factors that shape the well-being of foreign-born individuals (Viruell-Fuentes et al. 2012; for some recent exceptions see Dondero and Altman 2020; Morey 2018; Vargas, Sanchez, and Juárez 2017). In this way, scholars often invoke cultural explanations, including norms regarding individual health

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behaviors, when endeavoring to explain the immigrant health advantage (Viruell-Fuentes et al. 2012).

Second, there is a disconnect between immigration and punishment studies, with few exceptions (King, Massoglia, and Uggen 2012; Waters and Kasinitz 2015). Immigration literature examines the integration of newcomers but tends to overlook criminal outcomes (Rumbaut et al. 2006). At the same time, studies of punishment and inequality assess stratification by race, place, socioeconomic status, age, and gender, but largely neglect immigration-related factors such as ethnicity, nativity, generation, and legal status (Rumbaut et al. 2006). Similarly, while some recent research examines the role that incarceration plays in producing racial/ethnic disparities (e.g., Massoglia 2008; Nowotny, Rogers, and Boardman 2017; Wang and Green 2010; Wildeman 2012), the impact on potential nativity disparities in health is overlooked. In general, it is not clear in what ways and to what extent incarceration creates and maintains health disparities for individuals by nativity or how race/ethnicity and citizenship contribute to these outcomes.

Lastly, population-wide federal surveys generally use households as the sampling frame, which excludes inmates, active-duty military, the homeless, and other groups tenuously linked to households (Pettit and Sykes 2015). Previous work underscores that this method of data collection creates illusions of progress among black individuals, particularly men, in domains such as employment, education, and voting (Pettit 2012; Pettit and Skyes 2015). This myth of progress may also extend to other racial/ethnic minorities such as Latines—a population with a high percentage (34.4 percent foreign-born) of immigrants (Flores 2017)—who are also disproportionately incarcerated. Given that prisoners systematically differ from the general population in terms of characteristics such as racial/ethnic composition and educational

attainment, data gathered through conventional household surveys provide a biased depiction of the American experience (Pettit 2012). Consequently, the current study explores the ways in which disparity in incarceration "hinders the establishment of social facts, conceals inequality, and undermines the usefulness of key social science data" (Pettit and Sykes 2015:598). I expand this examination to include the potential systematic variation between non-incarcerated and incarcerated populations in another crucial domain: immigrant health.

Taking each of these limitations into consideration—the inattention to structural factors in immigrant health research, the disconnect between immigration and punishment research, and the exclusion of institutionalized populations in social science research—the present study assesses the health of individuals who are caught at the intersection of immigration and criminal legal systems. These individuals are doubly marginalized, by research and systems of data collection that push the experiences of incarcerated individuals to the periphery, as well as by the wider U.S. society that criminalizes, racializes, and socially excludes immigrants. Yet there are important empirical and theoretical reasons to expect that existing data provide limited accounts of immigrant health. In the present study, I hypothesize that the immigrant health advantage will, in general, extend to incarcerated immigrants, but the impingement of the criminal legal system will weaken its reach. I also postulate that the influence of the criminal legal system operates differentially based race/ethnicity and citizenship, two other critical characteristics in the U.S. social stratification scheme.

2.2    Data and Methods

2.2.1    Data

In order to evaluate the influence of the criminal legal system on immigrant health, I use data from the 2016 National Health Interview Survey (NHIS) (NCHS 2017a) and 2016 Survey of Prison Inmates (SPI) (U.S. Department of Justice 2020). The NHIS, collected by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics, is a publicly available survey that obtains comprehensive individual-level information regarding sociodemographic and socioeconomic characteristics, illness, disability, chronic impairments, and health care access and utilization. As is the norm for large national surveys, NHIS only includes members of the non-institutionalized population of the U.S. Despite the availability of more recent NHIS waves, I use the 2016 Sample Adult survey in order to maintain consistency with the most recent SPI dataset. The NHIS Sample Adult survey consists of one randomly selected member aged 18 years or older from each household in the sampling frame (NCHS 2017b). The response rate for the 2016 NHIS Sample Adult survey was 54.3 percent (NCHS 2017b). I combine the Sample Adult data with the Person Level data in order to get education, nativity, and citizenship information.

The SPI is a nationally representative survey of inmates held in state and federal prisons, most recently conducted by the Bureau of Justice Statistics (BJS) in 2016. Individuals held in local jails or Immigration and Customs Enforcement (ICE) facilities are not included in the sampling frame. The SPI gathers information regarding inmates' current offense and sentence, criminal history, prior drug and alcohol use and treatment programs, and family background and personal characteristics, including a battery of health outcomes. The vast majority of respondents in the 2016 SPI are imprisoned in state, rather than federal, facilities (87.90 percent). The

response rate was 69.3 percent among state prisoners and 72.8 percent among federal prisoners (U.S. Department of Justice 2020). Access to the restricted SPI data was approved by the IRB at the author's home institution.

Table 1 presents weighted descriptive statistics for these two samples. While the non-incarcerated (NHIS) sample includes a slight majority of women, the vast majority of the incarcerated (SPI) sample are men. Incarcerated respondents tend to be younger and less educated compared to non-incarcerated respondents. White individuals comprise a lower percentage of people in the incarcerated population than the non-incarcerated population, whereas all other racial/ethnic groups make up a larger proportion of the incarcerated population than the non-incarcerated population. As this table demonstrates, incarceration is not uniformly distributed across the population, with men, individuals under the age of 50, those with less than a high school degree, and racial/ethnic minorities overrepresented among the imprisoned.

[TABLE 1 HERE]

2.2.2   Measures

I use the NHIS and SPI data to investigate chronic physical health conditions. The first dependent variable is an overall indicator of *number of chronic conditions* measuring if respondents reported any of the seven physical health outcomes contained in both surveys: diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke. Previous research demonstrates that a summary count of physical conditions offers a more parsimonious indicator of general health compared to single health measures (Farmer and Ferraro 2005). I truncate the number of chronic conditions at four given that only 4.82 percent of respondents in the NHIS survey and 3.19 percent in the SPI survey reported four or more conditions. Sensitivity

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analyses reveal that estimating models with number of chronic conditions as a count variable ranging from 0-7 does not substantively alter the results.

I also assess several binary measures of health. I create a dichotomous measure of having a *chronic condition*, with 1 indicating the presence of any of the seven physical health outcomes included in both surveys. In order to gauge if disparities arise for specific conditions, I evaluate three common health outcomes: *diabetes mellitus*, *hypertension*, and *heart condition. Heart condition* includes heart disease, congestive heart failure, or arrhythmia. These health conditions are not only among the most frequent causes of morbidity and mortality in the U.S. population, but they also have a large enough number of respondents with the conditions in both the NHIS and SPI to evaluate individually. Respondents were asked if a doctor had ever diagnosed them with a specific condition; those who responded affirmatively were coded as 1 to indicate presence of the condition. I am not able to examine mental health conditions or symptoms due to differences in the questions asked between the two surveys.

The independent variables are incarceration status, nativity, race/ethnicity, and citizenship. No respondents in the NHIS sample were experiencing incarceration when completing the survey; conversely, all respondents in the SPI sample were incarcerated at the time of survey completion. Therefore, I categorize all NHIS respondents as *non-incarcerated* and all SPI respondents as *incarcerated* individuals. For analyses with pooled non-incarcerated and incarcerated samples, non-incarcerated is coded as 0 and incarcerated as 1. I create the variable *foreign-born* based on whether a person was born in the U.S. (0) or not (1) to measure nativity. An additional independent variable—race/ethnicity—critically impacts individuals' experiences related to incarceration and immigration. I divide *race/ethnicity* into four categories: non-Latine white (reference), non-Latine black, non-Latine other race, and Latine. From this point forward, I

refer to the racial/ethnic categories as white, black, other race, and Latine, respectively. Lastly, to evaluate the effect of citizenship, I create a combined *nativity/citizenship* measure with three categories: U.S. native-born citizen (reference), foreign-born citizen, and foreign-born noncitizen.

Covariates include gender, age, and educational attainment. *Gender* is a dichotomous variable with woman coded as 1. *Age* is a categorical variable, measured as 18-34 (reference), 35-49, and 50 years or older. *Education* measures respondents' highest completed level of schooling: less than high school (reference), high school graduate, some college, and college degree or higher. For the incarcerated sample, respondents are specifically asked about their educational attainment prior to imprisonment.

### 2.2.3    Analytic Strategy

The present study consists of three sets of analyses for the (1) NHIS sample; (2) SPI sample; and (3) Combined NHIS and SPI samples. For each of the three samples, I first conduct adjusted Wald tests to compare mean rates of number of chronic conditions and specific conditions for native- versus foreign-born respondents. Then, I estimate zero-inflated Poisson regressions to obtain the incidence rate ratios of having a higher number of chronic conditions. The choice of a zero-inflated Poisson model reflects the overdispersion and excessive number of zeros (41.74 percent in NHIS; 49.48 percent in SPI) in the outcome variable (number of chronic conditions). These excess zeros may ensue from separate processes compared to the other count values (1-4+); for example, a respondent may report zero conditions because they regularly visit the doctor and do not have any clinical signs warranting a diagnosis or because they do not have access to or utilize health services in order to receive a diagnosis. Results from a likelihood ratio

test of the equivalence of alpha to zero ($p>0.05$) indicate that a zero-inflated Poisson is a more appropriate model than a zero-inflated negative binomial. I employ robust standard errors for the zero-inflated Poisson model, as suggested by Cameron and Trivedi (2009). For diabetes, hypertension, and heart conditions, I estimate logistic regressions to obtain odds of reporting each of the three health outcomes by nativity, while controlling for gender, age, education, and race/ethnicity.

For the SPI sample specifically, I estimate these same regressions (zero-inflated Poisson and logistic regressions) for the entire incarcerated sample initially, before stratifying the sample by prison type to assess the odds of ill-health by nativity for prisoners in state facilities and prisoners in federal facilities. I do this in order to examine if facility type contributes to any observed health differences by nativity within the SPI sample. To check the robustness of these findings, supplemental analyses evaluate if offense type (i.e., violent, property, drug, public order, and unknown crime) accounts for variation in prisoner health by facility type.

To address my third research question, I next estimate regressions for each of the samples (a) stratified by race/ethnicity in order to compare nativity differences in each health outcome within each racial/ethnic group; and (b) using the three-category nativity/citizenship measure to assess the influence of citizenship. To display these results, I use an interaction term to generate and graph predicted probabilities for each health outcome in the combined sample by (a) incarceration status, nativity, and race/ethnicity; and (b) incarceration status, nativity, and citizenship. Supplemental analyses gauge the influence of immigrants' length of residence in the U.S., in years, on the relationship between incarceration status, nativity, and citizenship and health. Instead of using number of chronic conditions as an outcome as in the previous analyses,

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I use the dichotomous measure of presence of a chronic condition in the interactive regression models in order to simplify the presentation of predicted probabilities.

These analyses provide the information needed to assess: (1) Evidence of an immigrant health advantage in a standard national dataset that excludes incarcerated individuals (i.e. native- versus foreign-born risk/odds of experiencing a given health condition in the NHIS sample); (2) Evidence of an immigrant health advantage among incarcerated individuals (i.e. native- versus foreign-born risk/odds of experiencing a given health condition in the SPI sample); and (3) Evidence of an immigrant health advantage if datasets included both non-incarcerated and incarcerated respondents (i.e. native- versus foreign-born risk/odds of experiencing a given health condition in the NHIS and SPI samples combined). The analyses also allow the evaluation of what roles race/ethnicity and citizenship play in potential incarceration and nativity differences in health.

I utilize listwise deletion to exclude respondents missing any of the variables included in the models given that the vast majority of individuals have complete information. Final analytic samples are 31801 for the NHIS survey and 24125 for the SPI survey, representing 96.3 and 97.1 percent of the respondents who participated in each of the surveys, respectively. Respondents missing data in the NHIS survey are more likely to be older, identify as another race, be foreign-born, have lower levels of education, have a higher number of chronic conditions, and report diabetes, hypertension, or a heart condition. Respondents missing data in the SPI survey are similar to respondents with complete data in terms of gender, age, and education, but are more likely to be Latine, foreign-born, have a higher number of chronic conditions, and report a heart condition. The combined analytic sample includes 55926 respondents. All analyses are conducted in Stata-14 and weighted using the *pweight* command for the zero-inflated Poisson

models and the *svy* command for all other models to accommodate for survey design, ratio,

nonresponse, and post-stratification adjustment (NHCS 2017b; U.S. Department of Justice

2020). I weight the NHIS data using the Sample Adult weight, which produces national estimates

of the civilian, noninstitutionalized adult population (NCHS 2017b). The SPI data uses weights

that BJS statisticians calculated separately for state and federal prisoners in order to produce

national estimates of the adult prisoner population (U.S. Department of Justice 2020). In the

combined sample analyses, I use a single *pweight* or *svy* adjustment that applies the NHIS

Sample Adult weight for all non-incarcerated (NHIS) respondents and the SPI weight for all

incarcerated (SPI) respondents.

## 2.3    Results

### 2.3.1   Immigrant Health in the Non-Incarcerated Sample

First, I assess nativity differences in health using a standard national survey that excludes

prisoners, as previous research on the immigrant health advantage does. As Table 1 shows,

among the non-incarcerated sample, foreign-born respondents report significantly fewer chronic

conditions[4] compared to native-born respondents. While 60.03 percent of non-incarcerated

foreign-born individuals report zero chronic health conditions, 43.27 percent of non-incarcerated

native-born individuals do ($p<0.001$). Foreign-born respondents also less frequently report

hypertension ($p<0.001$) or a heart condition ($p<0.001$) than native-born respondents. However,

the percentage of individuals reporting diabetes does not differ by nativity. These analyses do not

account for key variables that influence health such as gender, age, education, or race/ethnicity,

though. Table 2, Model 1 presents results of the multivariate regression analyses among the non-

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[4] Includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

incarcerated sample.[5] Foreign-born respondents experience significantly lower risk of having a

higher number of chronic conditions compared to native-born respondents ($p<0.001$). In terms of

specific health outcomes, foreign-born individuals experience lower odds of hypertension

($p<0.001$) and heart conditions ($p<0.001$) than native-born individuals. Odds of diabetes again do

not differ by nativity among the non-incarcerated sample.

[TABLE 2 HERE]


2.3.2    Immigrant Health in the Incarcerated Sample

Now that baseline immigrant health advantages within the non-institutionalized

population are established, I next address the first research question: Is there evidence of an

immigrant health advantage among incarcerated individuals? As Table 1 presents, among

incarcerated individuals, foreign-born respondents more frequently report zero chronic

conditions ($p<0.001$) and less frequently report hypertension ($p<0.001$) or a heart condition

($p<0.01$) compared to their native-born counterparts. As Table 2, Model 2 shows, after

controlling for gender, age, education, and race/ethnicity, foreign-born respondents have

significantly lower risk of having a higher number of chronic conditions ($p<0.001$) and lower

odds of hypertension ($p<0.001$) compared to native-born respondents.[6] In contrast, incarcerated

respondents do not differ in their odds of diabetes or heart conditions by nativity.

In addition, I consider if prison facility type accounts for some of the variation in nativity

differences in health. As Table 3 displays, among individuals in state and federal prisons, results

are similar for number of chronic conditions, diabetes, and heart conditions. That is, regardless of

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[5] Results for the full model are available in Appendix Table A1.
[6] Results for the full model are available in Appendix Table A2.

prison facility type, incarcerated foreign-born individuals have significantly lower risk of having

a higher number of chronic conditions than their native-born counterparts ($p<0.001$), but odds of

diabetes and heart conditions do not differ by nativity. However, foreign-born respondents in

federal prisons have lower odds of hypertension than native-born respondents in federal prisons

($p<0.001$), but differences in hypertension by nativity are not pronounced in state prisons. These

results demonstrate that the health of incarcerated individuals varies somewhat by prison facility

type.

[TABLE 3 HERE]


2.3.3   Immigrant Health in the Combined Sample

This section presents results for the combined 2016 NHIS and SPI samples in order to

test the second research question: How does the inclusion of incarcerated individuals in the

analysis of immigrant health alter patterns of nativity disparities in health? Table 2, Model 3

presents results for multivariate regressions with the merged non-incarcerated and incarcerated

samples.[7] Incarcerated individuals have lower risk of having a higher number of chronic

conditions ($p<0.01$) and lower odds of diabetes ($p<0.001$), hypertension ($p<0.05$), and heart

conditions ($p<0.001$) compared to non-incarcerated individuals. Foreign-born respondents

exhibit significantly lower risk of having a higher number of chronic conditions ($p<0.001$) and

lower odds of hypertension ($p<0.001$), and heart conditions ($p<0.001$) relative to native-born

respondents. In contrast, nativity does not predict odds of diabetes. These findings are nearly

identical to those in Table 2, Model 1, when only the non-incarcerated sample is examined.

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[7] Results for the full model are available in Appendix Table A3.

Next, I consider the first part of the third research question: Given the racial/ethnic inequalities in incarceration, what role does race/ethnicity play in the relationship between incarceration status, nativity, and health? As Table 4 and Figures 1-4 show, health patterns by incarceration status and nativity become more nuanced when stratified by race/ethnicity.[8] Results from the zero-inflated Poisson and logistic regressions (Table 4) and adjusted Wald tests for the comparison of predicted probabilities (Figures 1-4) are substantively similar; therefore, I present results for the predicted probabilities given their ease of interpretation. Although foreign-born respondents tend to be in better health than their native-born counterparts, this trend does not apply to incarcerated whites. That is, incarcerated foreign-born white individuals exhibit a higher predicted probability of having a chronic condition (65.3 percent) compared to incarcerated native-born white individuals (56.9 percent), although the difference is only marginally significant (Figure 1; $p<0.10$). For all other racial/ethnic groups, foreign-born respondents have significantly lower predicted probabilities of having a chronic condition compared to their native-born counterparts.

Interestingly, there are no significant nativity differences in diabetes for any incarceration status or racial/ethnic group (Table 4 & Figure 2). Incarcerated foreign-born other race ($p<0.001$) and Latine ($p<0.001$) individuals exhibit significantly lower predicted probabilities of hypertension relative to their incarcerated foreign-born counterparts (Figure 3). While non-incarcerated foreign-born whites and blacks experience significantly lower likelihood of hypertension relative to non-incarcerated native-born whites and blacks, this nativity advantage in hypertension does not extend to incarcerated foreign-born whites or blacks. Similarly, while incarcerated foreign-born other race ($p<0.001$) and Latine ($p<0.05$) respondents demonstrate

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[8] Results for the full models are available in Appendix Tables A4-A7.

significantly lower predicted probabilities of having a heart condition relative to incarcerated

native-born other race and Latine respondents, incarcerated foreign-born whites and blacks do

not demonstrate statistically significant nativity disparities in likelihood of a heart condition

(Figure 4). Notably, though, non-incarcerated foreign-born white respondents also do not exhibit

a significantly different likelihood of reporting a heart condition relative to their native-born

counterparts.

[FIGURE 1 HERE]

[FIGURE 2 HERE]

[FIGURE 3 HERE]

[FIGURE 4 HERE]

Finally, I test the second part of the third research question: How does citizenship alter

the relationship between incarceration status, nativity, and health? Table 4 and Figure 5 present

results for the intersecting effects of incarceration, nativity, and citizenship statuses on health,

while controlling for gender, age, education, and race/ethnicity.[9] Again, I present results from the

adjusted Wald tests to compare the predicted probabilities (Figure 5) because they are

substantively similar to results from the zero-inflated Poisson and logistic regressions (Table 4).

Among the non-incarcerated sample, foreign-born citizens ($p<0.001$) and foreign-born ($p<0.001$)

noncitizens have significantly lower predicted probabilities of having a chronic condition relative

to native-born individuals. In contrast, among the incarcerated sample, foreign-born noncitizens

experience a significantly lower likelihood of having a chronic condition compared to native-

born citizens ($p<0.001$). Incarcerated foreign-born citizens have a probability similar to that of

their native-born counterparts.

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[9] Results for the full models are available in Appendix Tables A8-A11.

In terms of diabetes, foreign-born citizens also exhibit predicted probabilities comparable to native-born individuals, in both the non-incarcerated and incarcerated samples. Foreign-born noncitizens are significantly advantaged in terms of diabetes compared to native-born citizens within the non-incarcerated sample ($p<0.001$), but not in the incarcerated sample. Similar to the findings for number of chronic conditions, non-incarcerated foreign-born respondents are significantly advantaged in hypertension relative to native-born citizens, regardless of their citizenship status. For incarcerated respondents, this health advantage only extends to foreign-born noncitizens. Both non-incarcerated foreign-born citizens ($p<0.001$) and noncitizens ($p<0.001$) are significantly less likely to have a heart condition relative to non-incarcerated native-born citizens, but only incarcerated foreign-born noncitizens are advantaged in their likelihood of having a heart condition compared to their incarcerated native-born counterparts ($p<0.01$). For ease of interpretation, Table 4 presents a summary of the present study's main results.

[FIGURE 5 HERE]

[TABLE 4 HERE]

2.3.4   Robustness Checks

I conduct several additional tests to check the sensitivity and robustness of my results. First, I estimate all zero-inflated Poisson models with number of chronic conditions as a count variable ranging from 0-7, instead of truncating the measure at 4+. Doing so does not substantively alter any of the findings of interest (results available upon request).

In addition, differences in the health of individuals by type of offense may partially account for the variation in immigrant health between state and federal facilities. Individuals who

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are convicted of an immigration-related act, for example, fall under federal jurisdiction and may be healthier than those convicted of violent offenses, who are more likely to be in state prisons (U.S. GAO 2018). To explore this possibility, I estimate additional models that control for primary offense type (i.e., violent, property, drug, public order, and unknown crime). These supplemental analyses (available upon request) provide some support for this explanation and indicate that inmates convicted of a violent offense are both significantly more likely to be imprisoned by the state and have significantly higher odds of hypertension relative to individuals in federal prisons and those convicted of non-violent offenses. I am unable to account for offenses specifically related to immigration due to suppression of the relevant variables in the released SPI data.

Lastly, differences in average length of residence may be influencing findings on the relationship between incarceration, nativity, and citizenship statuses and health given that (1) naturalized citizens tend to have lived in the U.S. longer than noncitizens and (2) longer length of residency is associated with convergence to native-born health. First, in order to be eligible for citizenship, foreign-born individuals generally have to legally reside in the U.S. for five continuous years, or three years for spouses of U.S. citizens (U.S. Citizenship and Immigration Services 2020a). In 2016, the median length of residency for lawful permanent residents who attained citizenship was 7 years (Witsman 2017). Second, over time the health of immigrants declines as their length of residency in the U.S. increases (Cunningham et al. 2008).

As such, supplemental analyses (available upon request) suggest that some of the observed disadvantages in health for incarcerated immigrant citizens relative to incarcerated immigrant noncitizens are a product of their more prolonged time spent in the U.S. Among incarcerated immigrants, longer duration of residence is associated with significantly elevated

risk of having a higher number of chronic conditions and greater odds of having hypertension or a heart condition. Upon controlling for duration of residence, there is no difference in the odds of reporting a heart condition between incarcerated foreign-born citizens and noncitizens. However, duration of residence does not explain incarcerated foreign-born citizens' greater risk of reporting a higher number of chronic conditions or elevated odds of hypertension relative to incarcerated foreign-born noncitizens.

2.4     Discussion and Conclusion

Using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates, the current study addressed several critical and unresolved questions in the immigration and punishment literature: Does the immigrant health advantage extend to incarcerated immigrants? How does the inclusion of incarcerated individuals in the analysis of immigrant health alter patterns of nativity disparities in health? What roles do race/ethnicity and citizenship play in the relationship between incarceration status, nativity, and health? In regards to the first question, results indicated that foreign-born individuals had an advantage in terms of number of chronic conditions and hypertension, irrespective of incarceration status. In other words, similar patterns in these health outcomes observed among the non-incarcerated population also existed in the incarcerated population, when type of prison facility, race/ethnicity, and citizenship were not considered.

Findings for number of chronic conditions and hypertension aligned with much of the existing literature on the immigrant health advantage, which establishes that non-incarcerated immigrant populations tend to display better health compared to native-born individuals, even after accounting for gender, age, and socioeconomic status (e.g., Cunningham et al. 2008; Jasso

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et al. 2004; Riosmena et al. 2017; Singh and Siahpush 2002). It is likely that self-selection of individuals into migration contributes to the observed advantages in health, as previous studies of non-incarcerated immigrants determine (Landale et al. 2006; Riosmena et al. 2017; Riosmena et al. 2013). The finding that nativity did not predict odds of diabetes also supports prior research that indicates many foreign-born groups experience higher rates of diabetes relative to the native-born population (Cunningham et al. 2008). This pattern may be linked to the higher obesity rates and faster rates of "unhealthy" weight gain—significant predictors of diabetes (Narayan et al. 2007)—among more recent immigrant cohorts compared to those who arrived in previous decades (Giuntella and Stella 2016).

Nevertheless, the immigrant health advantage among prisoners did not extend to heart conditions, which contrasts previous evidence of a foreign-born advantage in heart disease (Jasso et al. 2004). The immigrant health advantage thus appeared to be weaker among prisoners since incarcerated foreign-born individuals did not exhibit better health relative to their native-born counterparts for all of the same outcomes as in the general population. There may be unique short- and long-term health challenges to immigrants who experience incarceration. In the case of heart conditions, immigrants face barriers to health care (Balcazar et al. 2015a; Ku and Matani 2001), which reduces access to preventative care and early detection of heart health risk factors (Pérez-Escamilla, Garcia, and Song 2010). Imprisonment—a highly stressful experience (Porter 2019)—may exacerbate these vulnerabilities, as psychological distress, perceived discrimination, and worry about deportation predict cardiovascular risk among immigrants (Martos-Méndez et al. 2020; Torres et al. 2018). Simply put, the criminal legal system may undermine specific aspects of immigrant health. Research should continue to theoretically and empirically explore

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the ways in which the sociolegal climate contributes to variation and decline in immigrant well-being.

Consideration of two other influential factors—race/ethnicity and citizenship—also complicated this straightforward finding of an immigrant health advantage among incarcerated individuals. When results were not stratified by race/ethnicity, it appeared that the immigrant health advantage held for the number of chronic conditions and hypertension. In contrast, when examined by race/ethnicity, further limits to the immigrant health advantage emerged. For example, incarcerated Latine immigrants exhibited better health in terms of number of chronic conditions, hypertension, and heart conditions compared to their native-born counterparts. Yet the immigrant health advantage did not extend to incarcerated foreign-born whites in terms of number of chronic conditions, incarcerated foreign-born whites and blacks in terms of hypertension, or incarcerated foreign-born whites and blacks in terms of heart conditions.

With the exception of the results for incarcerated foreign-born blacks in regards to hypertension and heart conditions, these findings support previous research, which reveals that advantages in health by nativity are larger for black and Latine immigrants than for white immigrants (Engelman and Ye 2019; Singh and Miller 2004; Singh and Siahpush 2002). They also provide limited support that inmates may experience diminished health disparities by race/ethnicity because of racial/ethnic inequalities in imprisonment and health care access prior to incarceration. Mass incarceration affects a wider, generally healthier population of blacks and Latines compared to whites (Dumont et al. 2013). In other words, with disproportionately lower incarceration rates, imprisoned foreign-born whites are less representative of the broader white immigrant population. Moreover, health care access and/or quality for blacks and Latines in the general population may be so inadequate that the receipt of health care services upon

imprisonment reduces some racial/ethnic disparities in health (Patterson 2010). When viewed this way, the partial findings of an immigrant health advantage among prisoners, particularly for racial/ethnic minorities, should not be interpreted as evidence that incarceration is not detrimental to health, but rather as an indictment of the racial/ethnic disparities in health care access and imprisonment (Dumont et al. 2013; Patterson 2010).

Although this finding of reduced racial/ethnic health inequalities among prisoners may hold for foreign-born other race and Latine individuals, it does not explain the nativity patterns in specific health outcomes for black immigrants. Incarcerated foreign-born blacks' overall health advantage in number of chronic conditions relative to their native-born counterparts did not extend to an advantage in diabetes, hypertension, or heart conditions. Mixed findings regarding an immigrant health advantage among incarcerated foreign-born blacks may reflect a carceral system that disproportionately targets black men and immigrants. Because blacks (Kovera 2019; Kutateladze 2014; Rehavi and Starr 2014) and noncitizens (Light 2014; Scalia 1996) experience unduly severe charges and longer sentences, the criminal legal system may create an environment that is particularly corrosive to specific aspects of health for individuals at the intersection of these identities. Research should continue to explore the potential contributions of health selection into imprisonment, as well as the health-eroding consequences of incarceration, on individuals by nativity and race/ethnicity.

Citizenship also accounted for some of the variation in health by nativity specifically for incarcerated individuals. This is because both foreign-born citizens and noncitizens exhibited significantly lower risk of reporting a higher number of chronic conditions and odds of hypertension relative to native-born citizens in the non-incarcerated sample, but only foreign-born noncitizens were advantaged compared to native-born citizens in the incarcerated sample.

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Thus, the immigrant health advantage also did not extend to incarcerated immigrants who obtained citizenship. This particular finding counters existing literature on citizenship and health. Since citizenship grants social, civil, and economic advantages to immigrants (Castañeda et al. 2015; Miranda et al. 2017), it shapes immigrants' ability to access health insurance (Goldman et al. 2005) and subsequent health (Campbell et al. 2012). However, the health of immigrants declines over time as their length of residency in the U.S. increases, and eventually converges with that of the native-born population (Cunningham et al. 2008). The present study demonstrates that duration of residence explained some, but not all, of the observed disadvantages in health for incarcerated immigrant citizens relative to incarcerated immigrant noncitizens. Additional research is needed to disentangle the mechanisms generating the health disadvantages of incarcerated immigrants who have obtained citizenship.

The current study has some limitations. First, due to data constraints, I was only able to examine the health of individuals at a single point in time. It is therefore unknown to what extent health selection plays in the observed patterns. That is, immigrants that experience incarceration may be less healthy than those that do not. Despite this limitation, empirical evidence supports the characterization of the criminal legal system as a structural force that erodes incarcerated individuals' health over time (Esposito et al. 2017; Massoglia 2008; Patterson 2013; Schnittker and John 2007) and not simply an institution that individuals select into based on their health status (Baćak and Wildeman 2015). Future research should continue to explore the relationship between incarceration and health over time in order to account for potential health selection effects as well as to establish a causal link between the criminal legal system and immigrant health.

This limitation may also partially explain the somewhat surprising findings of overall lower odds of chronic physical health conditions among incarcerated individuals, regardless of nativity, compared to non-incarcerated individuals. Several existing studies demonstrate higher rates of chronic conditions among the incarcerated compared to the non-incarcerated population (e.g., Binswanger et al. 2009). However, the health-damaging effects of imprisonment develop gradually and are particularly visible after release (Schnittker and John 2007; Wildeman and Wang 2017). There is additional evidence that imprisonment can improve access to health care and health in the short-term (Binswanger et al. 2012; Patterson 2010; Wildeman and Wang 2017), which the present study may have captured due to the cross-sectional nature of the data. It is therefore likely that the deteriorating effects of imprisonment would be better revealed in longitudinal investigations.

Second, I restricted analyses to number of chronic physical health conditions and three specific chronic conditions based on available measures and sample size limitations. My selection of dependent variables was limited to health outcomes that were measured the same way in both surveys. In addition, assessing differences in health by incarceration status, nativity, race/ethnicity, and citizenship for lower prevalence conditions would have critically reduced the power of the analyses. It is possible that incarcerated immigrants experience significant disadvantages in health for other, unexamined outcomes, such as self-rated health, infectious diseases, or depression.

Third, the physical health outcomes I assessed were all self-reported based on a physician diagnosis. This means that the accuracy of the dependent variables relies on respondent candidness and recall in reporting conditions, as well as access to adequate health care in order to receive a diagnosis. Given that immigrants (Balcazar et al. 2015a; Goldman et al. 2005; Ku and

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Matani 2001) and inmates (Wilper et al. 2009) often face substantial barriers to health care, relying on self-reported physician diagnoses may result in an underestimation of the prevalence of chronic health conditions among incarcerated immigrants.

Lastly, given data limitations, I was not able to account for immigrants held in local jails or ICE facilities. Nevertheless, findings from the present study indicated that the health of immigrants varied somewhat by prison facility type (i.e., state vs. federal). In 2016, local jurisdictions detained 83,700 individuals in jails (Carson 2018) and ICE detained 352,882 individuals in civil detention facilities (Office of Immigration Statistics 2016). This represents an even larger population of immigrants caught up in the legal system than those incarcerated at the state and federal level. It is unknown if the present findings of a diminished immigrant health advantage among incarcerated individuals extends to these other confined populations. Future research should examine the health of immigrants jailed in local and ICE facilities.

Despite these limitations, this study is the first to investigate if there is evidence of an immigrant health advantage among the incarcerated population. Another important contribution of the present study is the theoretical foregrounding of structural forces, rather than cultural or individual factors, in generating variation and deterioration in immigrant health. Through this process, I bridged a research gap between divergent areas of sociological research in immigration and punishment studies. Because immigration studies generally omit criminal outcomes among immigrants and punishment studies largely overlook disparities by nativity and legal status (Rumbaut et al. 2006), the extant literature misses the experiences of individuals at the intersection of these systems of stratification. Yet, given that the U.S. criminal legal system is designed to treat noncitizen immigrants with undue severity and with less attention to their constitutionally protected rights, immigration and punishment are intimately intertwined. As

such, results from the present study demonstrate that the immigrant health advantage extends to some incarcerated immigrants, but it is not consistent across foreign-born populations by health outcomes or race/ethnicity and citizenship. Overall, evidence of an immigrant health advantage is weaker among prisoners than among the non-incarcerated population. These findings suggest that structural forces such as mass incarceration, racial/ethnic stratification, and immigration status have enormous potential to shape the health of individuals.

Beyond demonstrating the theoretical fruitfulness of bridging immigration and punishment literature, the current study also highlights the importance of challenging accepted social facts that may be obscuring hidden disparities. When researchers examine the immigrant health advantage using survey data from a standard, nationally representative sample of the non-institutionalized population alone, findings portray patterns in health that do not exist for many immigrants experiencing incarceration. That is, studies utilizing data gathered through conventional household surveys provide a biased depiction of the immigrant experience. When I added a nationally representative sample of prisoners to a sample of non-institutionalized individuals in the analysis of immigrant health, results were virtually unchanged from findings among the non-institutionalized sample. Instead, differences emerged when I assessed the health of incarcerated individuals specifically. In the context of a society plagued by systems of mass incarceration and the racialized criminalization of immigrants, the exclusion of this population in previous immigrant health research hinders the establishment of social facts and the illumination of health disparities. Incarcerated immigrants are therefore doubly marginalized, in both research and in U.S. society. Future research should continue to uncover the health implications of these systems, especially for understudied populations such as incarcerated immigrants.

**CHAPTER 3**

**Divergent Immigrant Health Trajectories: Disparities in Physical Health Using a Multidimensional Conceptualization of Legal Status**

In general, immigrant health research focuses on the nativity component of immigration status and demonstrates that foreign-born individuals tend to be in better health than their native-born counterparts (*e.g.*, Cunningham, Ruben, and Venkat Narayan 2008). This immigrant health advantage is largely explained by self-selection of healthier individuals into migration (Landale, Gorman, and Oropesa 2006; Riosmena, Kuhn, and Jochem 2017), cultural influences such as dietary habits and strong social networks (Eschbach et al. 2004; Riosmena, Kuhn, and Jochem 2017), and data quality issues (Patel et al. 2004; Turra and Elo 2008). Yet, the immigrant health advantage is not universal; rather, work that supports the advantage often neglects disparities in health between different foreign-born populations and across some health outcomes, as well as the erosion of immigrant health over time (Angel, Buckley, and Sakamoto 2001; Boen and Hummer 2019; Cunningham, Ruben, and Venkat Narayan 2008; Gubernskaya, Bean, and van Hook 2013; Jasso et al. 2004). Importantly, the structurally-embedded elements of immigration status that stratify the foreign-born population into a hierarchy of privilege remain critically understudied (Bacong and Menjívar 2021).

Beyond nativity, immigration status encompasses various interconnected factors such as duration of residence, authorization status and type, and citizenship (De Genova 2002; Durden 2007). These aspects of immigration status are a product of U.S. laws and regulations generating notions of migrant illegality and belongingness (Ngai 2004; Donato and Armenta 2011).

Therefore, I employ the term "legal status" to represent the three structural components of immigration status that I assess in this paper: initial authorization classification, LPR admission category, and citizenship.

Legal status stratifies immigrants into a hierarchy of privilege, with differential rights and access to resources such as employment opportunities and health-promoting services (Bean et al. 2011; Patler 2018; Torres and Young 2016; Yoshikawa 2011). For instance, immigrants who entered the U.S. with an employment visa experience significantly better labor market integration relative to those who entered undocumented or with a refugee visa, even after all respondents in the sample attained lawful permanent residence (Kreisberg 2019). However, the impact of legal status on health is underexplored. Existing studies demonstrate that legal status predicts self-rated and mental health (Martinez et al. 2015), but scant research examines the effects of legal status on physical health outcomes (Hamilton, Hale, and Savinar 2019). In addition, extant literature typically frames legal status as a static or binary characteristic through the examination of differences between documented/undocumented or citizen/noncitizen immigrants. These dualistic frameworks overlook immigrants with "liminal legality"—those with the privileges related to being authorized as well as the disadvantages associated with being a noncitizen (Menjívar 2006). In general, immigrant health scholarship is limited by its focus on the nativity component of immigration status and incomplete conceptualizations of legal status.

The present study builds upon the emerging notion of legal status as a multidimensional and dynamic characteristic to evaluate if legal status shapes the physical health trajectories of immigrants. I utilize the New Immigrant Survey (NIS), a longitudinal survey of lawful permanent residents in the U.S., to assess the association between three dimensions of legal status—initial authorization classification, LPR admission category, and citizenship—and

physical health outcomes. Because these institutional categorizations can vary over time as individuals navigate the immigration system (Torres and Young 2016), I frame my study within the life course perspective.

The rest of the paper is structured as follows. I begin by discussing the life course perspective as a framework for understanding immigrant health trajectories. Then, I review each of the dimensions of legal status included in the present study and their established relationships to health. Next, I explain the ways in which this study extends upon existing research, before detailing the data and methods I use. I then present the descriptive results, followed by findings from the logistic regressions at baseline and over time. I end with a discussion of the results in light of extant findings, and the implications of the present study.

3.1     Background

3.1.1   Legal Status and Health over the Life Course

The life course perspective offers a framework for conceptualizing legal status as a stratifying characteristic that shapes the health trajectories of immigrants, as proposed by Torres and Young (2016). The life course perspective is a theoretical lens that highlights how earlier phases of life are related to later ones as well as how larger social, structural, and historical forces influence people's lives over time (Elder 1975). The concepts of transition and trajectory help identify and situate experiences over the life course. A trajectory is the particular route an individual's life takes, while a transition is an occurrence that affects this life path (de Oca et al. 2011; Elder, Johnson, and Crosnoe 2003). Transitions and trajectories are rooted in and constrained by social and institutional environments (de Oca et al. 2011; Elder 1975), often patterned by the social groups to which individuals belong (Elder 1998). The present study

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explores the legal statuses that characterize the process of migration, a life-altering transition that shapes immigrants' health trajectories.

Researchers seldom examine legal status or immigrant health according to a life course framework. Yet the life course perspective offers a useful lens for studying legal status stratification as a social determinant of health (Torres and Young 2016; Viruell-Fuentes 2007). Legal status shapes the transition into migration as well as social and civil integration after arrival (Kreisberg 2019; Torres and Young 2016). It also influences health trajectories of immigrants. For example, in one qualitative study, undocumented migrants aged 50 years and older viewed their own rapid decline in health as related to decades of manual, low-wage labor (de Oca et al. 2011). Moreover, changes in legal status can improve or worsen health. Among older adults who migrated to the U.S. as children or young adults, citizenship is associated with greater civic, occupational, and economic integration and fewer functional limitations relative to lawful permanent residence status (Gubernskaya, Bean, and van Hook 2013). As the life course perspective helps illuminate, legal status shapes the cumulative experiences of immigrants across social domains.

### 3.1.2    Dimensions of Legal Status

3.1.2.1 Initial authorization classification

The term authorization classification signifies the lawful aspect of legal status. Research regarding this dimension tends to focus on documented compared to undocumented status. Due to the sensitivity of the subject matter, studies on authorization classification typically use small and/or nonrandom samples or rely on indirect methods of categorization (Hamilton, Hale, and Savinar 2019). For instance, the residual estimation methodology determines legal status through

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a series of questions about nativity, citizenship, and green card status; foreign-born, noncitizens who indicate that they do not have a green card—a permanent residence visa that allows individuals to live and work in the U.S. in perpetuity (U.S. Citizenship and Immigration Services n.d.)—are classified as undocumented (Hacker et al. 2011; Ortega et al. 2007; Rodriguez, Bustamante, and Ang 2009). This indirect method of ascertaining undocumented status avoids some apprehension about requesting respondents to divulge sensitive information but generates other concerns regarding potential misclassification.

Despite the methodological considerations, an emerging body of literature proposes that unauthorized immigration status is disadvantageous for health (Cabral and Cuevas 2020). The transition into migration for undocumented migrants is often fraught with traumatic physical and psychological experiences (Holmes 2013). After arrival, undocumented status blocks access to publicly funded healthcare. It also produces fear about being reported to immigration authorities when receiving medical or other social services (Berk and Schur 2001; Hacker et al. 2015). This deportation threat is a chronic stressor that also impacts social relationships and generates economic uncertainty (García 2018), which can lead to adverse mental health outcomes like depression (Martinez et al. 2015; Yoshikawa 2011).

However, empirical research on the impact of authorization classification on physical health outcomes is inconsistent. A minority of studies demonstrate that undocumented status can result in adverse physical health outcomes such as elevated blood pressure (Young and Pebley 2017) and higher rates of labor complications like excessive bleeding (Reed et al. 2005) for undocumented compared to documented immigrants and/or native-born citizens. In contrast, one systematic review reveals that most studies (71 percent) do not demonstrate a significant difference between the health of documented and undocumented immigrants (Hamilton, Hale,

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and Savinar 2019). For example, Ro and van Hook (2021) find that Latinx and Asian undocumented immigrants generally exhibit similar self-rated health and disability compared to documented immigrants and native-born individuals. Other studies show that undocumented immigrants exhibit better physical health than documented immigrants. For instance, undocumented women simultaneously experience decreased rates of low birth weight for infants and preterm delivery relative to their documented and native-born counterparts (Reed et al. 2005). Lu and Li (2020) additionally demonstrate that both undocumented Mexican men and women report better self-rated health relative to non-migrant Mexicans, which indicates undocumented immigrants' self-selection into migration contributes to their health advantage.

The relationship between documentation status and physical health may be ambiguous due to the utilization of conceptions of legal status that do not reflect the reality of many immigrants' experiences. Extant studies rely on a binary categorization of authorization classification even though it is often not a static characteristic. Many immigrants are undocumented before acquiring temporary or permanent legal status (Gonzales, Terriquez, and Ruszczyk 2014; Jasso et al. 2008). The stress of being unauthorized, even temporarily, may have enduring mental and physical health effects (Martinez et al. 2015; Cavazos-Rehg, Zayas, and Spitznagel 2007; Torres and Young 2016). Therefore, authorization classification likely shapes immigrants' health trajectories, but further research is needed to disentangle this relationship.

3.1.2.2 LPR admission category

In this paper, LPR admission category refers to the criteria through which individuals were eligible for their green cards, or lawful permanent residence (LPR) visas. Non-U.S. citizens need a visa to legally enter the country. Some of these visas confer LPR status, but most

individuals enter the country with nonimmigrant visas that are either temporary or conditional, such as a student or tourist visa. Others enter the U.S. without a visa, and thus without authorization, but later acquire a residence visa. In order to obtain an LPR visa, then, an individual must meet certain eligibility requirements. These criteria align with the major categories of entry immigrant visas (e.g., family preference, employment, refugee), but their eligibility may be demonstrated after an individual already resides in the U.S., rather than before, as is the case for entry visas. For example, an individual may enter the country with a student visa, but later receive an LPR visa through employment criteria. If one were to measure visa status based on their entry visa, this individual would be classified as a visiting student; yet, their transition into a new visa category while residing in the U.S. indicates that they would be better classified as an employment immigrant. Therefore, by assessing visa status as LPR admission category, I am able to capture a unique element of legal status beyond authorization classification, especially for individuals who entered the country with nonimmigrant visas or no visa.

The present study includes immigrants who were eligible for LPR visas through family preference, employment, refugee, legalization, and diversity criteria. In order to meet these various classifications, immigrants must have different resources at their disposal. Family preference eligibility criteria requires an immigrant to have a U.S. citizen or green card-holding family member already in the U.S. with an income at least 125 percent above the poverty line (USCIS 2020b). Family preference immigrants subsequently have strong social connections with moderate financial resources (Kreisberg 2019). Employment eligibility criteria require an employer sponsor, which often necessitates a high level of education (Kreisberg 2019; USCIS 2020b). Employment immigrants therefore experience better labor market integration compared

to other visa holders (Kreisberg 2019). Refugee status is available to individuals who the U.S. government acknowledges face serious danger in their country of origin (Office of Refugee Resettlement 2020). After one year as an officially recognized refugee, immigrants are able to apply for an LPR visa (USCIS 2020b). Refugees often lack the social and economic resources of family preference and employment immigrants (Kreisberg 2019), but are entitled to state services that provide social welfare, employment counselors, and English language classes for two years (Office of Refugee Resettlement 2019). Eligibility for LPR status through legalization criteria is available to unauthorized immigrants who meet certain length of residence qualifications and other policy criteria such as cancellation-of-removal (Jasso 2011). Lastly, diversity criteria are accessible to a restricted number of individuals with at least a high school degree or its equivalent from countries with low levels of historical migration (U.S. Department of State n.d.). Like refugees, diversity immigrants often do not have the strong social ties of family preference and employment immigrants (Kreisberg 2019), but they have some financial resources due to the costs of the diversity program (Logan and Thomas 2012).

LPR admission categories indicate prior life chances and accessibility of resources associated with health. For example, previous research demonstrates that immigrants who are eligible for LPR status through family preference and refugee criteria are less likely to experience positive health selection compared to employment immigrants (Akresh and Frank 2008). The process of attaining a visa also creates differential stress due to varying levels of difficulty in meeting certain criteria as well as waiting periods produced by administrative prioritization and backlog (Jasso 2011; Morey et al. 2020; Obinna 2014). Such visa-related stress can generate long-lasting immigrant health disparities, in terms of both mental (Jasso 2011; Jasso et al. 2005) and physical (Morey et al. 2020) health. While previous research establishes that

entry visa classifications stratify immigrants into a hierarchy of health advantage prior to arrival in the U.S. (Morey et al. 2020), the present study assesses if LPR admission categories shape the physical health trajectories of immigrants as they reside in the U.S.

3.1.2.3 Citizenship

In addition to authorization and LPR admission distinctions among immigrants is the citizenship divide. Legal statuses such as LPR and refugee grant permission to be in the country, but not the same rights regarding employment or public benefits as citizens (Torres and Young 2016). Being documented but not a citizen can cause some of the same strain associated with being undocumented. Notably, until a person acquires citizenship, deportation looms as a possible threat. For example, noncitizen immigrants who commit crimes such as filing a false tax return are subject to immediate deportation and permanent prohibition from the country (American Immigration Council 2016). Whether or not a crime has been committed, nearly 11 percent of naturalization applications are denied (USCIS 2018), which leads to a continued legal disadvantage or even loss of legal residence and deportation. Consequently, both documented and undocumented immigrants disclose comparably high levels of stress, anxiety, and hopelessness due to deportation fear, for themselves and their family and friends (Arbona et al. 2010; Hacker et al. 2011). Legal status stress is in turn associated with poor self-rated health (Cavazos-Rehg, Zayas, and Spitznagel 2007; Finch and Vega 2003).

Subsequently, being an authorized noncitizen immigrant is also accompanied by social, civil, economic, and health disadvantages because it does not provide the stability and certainty of citizenship, nor equal access to health-promoting resources. Citizen immigrants earn 8-11 percent more in annual income compared to noncitizens (Pastor and Scoggins 2012).

Furthermore, citizenship grants people better access to healthcare. Noncitizens are not eligible

for federal assistance programs until after the completion of five years as legal U.S. residents

(Goldman, Smith, and Sood 2005). In addition to being less likely to have public insurance

through Medicaid and Medicare, noncitizens are less likely to have employer or individual

insurance coverage than foreign- and native-born citizens (Goldman, Smith, and Sood 2005).

Compared to naturalized citizens, undocumented immigrants display the highest rates of lacking

health insurance, but even LPRs exhibit a significant disadvantage in health insurance coverage

(Goldman, Smith, and Sood 2005). Consequently, noncitizens are less likely to have a regular

source of care compared to citizens, even when insured (Balcazar, Grineski, and Collins 2015a;

Derose et al. 2009; Goldman, Smith, and Sood 2005; Ku and Matani 2001).

The lack of access to health care may have lasting consequences for the health of

noncitizen immigrants across different authorization classifications and LPR admission

categories. Nevertheless, few studies examine the effects of citizenship on health outcomes and

findings to date are mixed (Bacong 2021; Campbell et al. 2012; García-Pérez 2013; Van Natta et

al. 2019). One study indicates that a health advantage in self-rated health exists for Latinx

citizens in the U.S., but this advantage does not extend to Latinx noncitizens (Campbell et al.

2012). Compared to the health of non-Latinx and Latinx citizens, Latinx noncitizens' health

benefits the least from increases in income (Campbell et al. 2012). In contrast, García-Pérez

(2013) finds that parents of noncitizen children tend to perceive their kids to be in better health

than parents of citizen children, even though they experience lower odds of visiting a doctor in

the past twelve months. Other studies reveal that citizenship does not affect the likelihood of a

child having a respiratory health condition or a psychological problem, despite its association

with lacking insurance and a regular doctor (Balcazar, Grineski, and Collins 2015b; Filion,

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Fenelon, and Boudreaux 2018). These findings may reflect a genuine morbidity advantage for noncitizen children, but barriers to care could also limit parents' awareness of health problems. It is further likely that citizenship has a greater impact on some health outcomes compared to others. Thus, in addition to socioeconomic status and racism (Phelan and Link 2015; Phelan, Link, and Tehranifar 2010), citizenship is an underexplored fundamental social determinant of health (Castañeda et al. 2015; Miranda et al. 2017; Viruell-Fuentes 2007).

### 3.1.3   The Present Study

In the present study, I use longitudinal data to evaluate the influence of legal status on physical health across the life course. This strategy recognizes that legal status is a dynamic form of stratification, and initial legal statuses can have persistent consequences for health, even after immigrants attain lawful permanent residency. Moreover, research tends to examine legal status through binary documented/undocumented or citizen/noncitizen frameworks. Nevertheless, legal status comprises a hierarchy of rights, privileges, and incorporation, and is thus better conceived multidimensionally (Bean et al. 2011; Patler 2018). Therefore, in contrast to most existing research, I conceptualize legal status as a multifaceted characteristic which includes initial authorization classification, LPR admission category, and citizenship. Lastly, while there is an emerging body of literature examining the association of legal status with self-rated and mental health (Martinez et al. 2013), research on the physical health is scant (Hamilton, Hale, and Savinar 2019). In sum, the current study examines how multidimensional and dynamic aspects of legal status shape physical health.

3.2     Data and Methods

Data in this study came from the New Immigrant Survey (NIS), a nationally

representative (n=8,573) longitudinal survey of adult immigrants surveyed due to their recent

acquisition of lawful permanent residence (LPR) status in the U.S. at the time of survey

recruitment. Respondents were recruited through administrative records of new immigrants who

entered the U.S. or adjusted their legal status from May-November 2003. The two interviews

occurred approximately five years apart, the first in 2003 and 2004, immediately after

respondents obtained LPR status, and the second between 2007 and 2009 (Jasso et al. 2006). The

first interview had a response rate of 69 percent, while the second interview had a response rate

of 46 percent. Interviews were conducted in respondents' preferred language and included wide-

ranging topics such as migration history, employment, education, and health. I used this data to

conduct two sets of analyses which capture the relationship between legal status and physical

health (1) at the first interview and (2) over time, between survey waves.


3.2.1    Measures

The dependent variable is an overall indicator of physical health based on self-reported

health conditions. Respondents were specifically asked if a given condition was diagnosed by a

doctor. Having a chronic condition is a dichotomous measure signifying if respondents reported

any of the eight physical health outcomes contained in the survey (1=presence of condition;

includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung

conditions). Operationalizing physical health as a count of health conditions did not alter the

results due to the infrequency of respondents indicating more than one illness (3.69% at

baseline); therefore, I utilized a more parsimonious binary physical health measure. Sample sizes

for respondents indicating specific chronic conditions lacked the statistical power to analyze

individually for each of the dimensions of legal status.

3.2.1.1 Legal status variables

The principal independent variable is legal status prior and subsequent to acquiring LPR

status. Although all respondents in the NIS sample achieved LPR status before survey

recruitment, LPRs enter the country with different legal statuses. Prior legal status may influence

the transition into LPR status and ensuing health trajectories. In addition, a portion of

respondents attained citizenship by the second interview, which may also alter their health

trajectories. Since legal status is a multidimensional attribute, I measured it in three ways: initial

authorization classification, LPR admission category, and citizenship.

First, I grouped prior legal status into three categories based on respondents' type of

authorization on their most recent trip to the U.S.: permanently documented, temporarily

documented, and undocumented. A binary (documented vs. undocumented) conceptualization of

authorization can conceal the experiences of immigrants who are documented but hold

temporary visas, such as students (Ortega et al. 2007). Thus, I included two categories of

authorized immigrants. The permanently documented group is comprised of individuals who

entered the U.S. for the first time when they obtained their green cards and serves as the

reference category. Individuals in the permanently documented group had no prior experience in

the U.S. and entered the country with permanent resident visas. The temporarily documented

group includes respondents who entered the country with legal documents that were conditional

or temporary. The third group, undocumented, consists of those who entered without documents

or with fraudulent documents.[10] This first dimension encapsulates the lawful facet of immigrant legal status.

Second, I grouped respondents according to the type of criteria they met in order to obtain their LPR visa: family preference (reference), employment, refugee, legislation, and diversity or other. Within the diversity or other category, 63 percent were diversity visa holders and 37 percent met other, undisclosed criteria. Although previous research found health variation among immigrants with different types of family preference eligibility (Morey et al. 2020), supplemental analyses (not shown) revealed no statistically significant differences in odds of reporting a chronic condition between those who received LPR status through unlimited type of family preference eligibility (i.e., spouse of U.S. citizen) compared to those who received LPR status through a limited type of family preference eligibility (i.e., spouse of LPR). Consequently, I sorted family preference immigrants into a singular category. The LPR admission categorization of legal status indicates the conditions surrounding migration and authorization, such as particular eligibility criteria and available resources.

Lastly, I included citizenship as a measure of legal status in the longitudinal analyses. This variable indicates whether respondents obtained U.S. citizenship by the second interview and captures the citizen/noncitizen divide.

3.2.1.2 Social determinants of health

I included several sociodemographic covariates associated with health. Gender is a dichotomous variable (1=woman). Age is measured in years. Race/ethnicity is split into five

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[10] The undocumented group does not include immigrants whose legal documents expired after they were already in the country, although such an occurrence qualifies them as undocumented. I discuss this limitation in the discussion section.

categories: Latinx (reference), non-Latinx white, non-Latinx Asian, non-Latinx Black, and non-Latinx other race. Education is a categorical variable that measures the number of years of schooling completed at the time of the first interview: less than high school (reference), high school graduate, some college, and college degree or higher. I also included a dichotomous variable measuring whether respondents received an additional degree between survey waves (1=yes) in the longitudinal analyses. Marital status indicates whether respondents were 1=married or living with a partner or 0=never married, separated, divorced, or widowed. Similarly, employment status signifies whether respondents were 1=currently employed or 0=else.

Models also controlled for two characteristics related to migration history. Region of origin includes four broad regions based on where respondents were born: Latin America (reference), Asia, Africa or Middle East, or Europe or North America. Duration of residence measures the number of years since respondents last moved to the U.S.

3.2.2   Analytic Strategy

Although the main focus of this paper is the relationship between legal status and health over time, I first assessed the health of respondents at the first wave of the survey in order to establish a baseline association between the variables of interest. In the preliminary set of analyses, I used the first wave of data to conduct a series of logistic regressions, assessing the odds and predicted probabilities of respondents reporting a chronic condition by prior legal status. In the second set of analyses, I evaluated health status using both waves of data. This second set of regressions determines if prior and current legal status have enduring effects on health, five years after all immigrants in the sample achieved the same legal status as LPRs. As

in the first series, I employed logistic regressions to assess respondents' odds and predicted probabilities of having a chronic condition. This second group of regressions includes an error term to account for the longitudinal nature of the data. Unlike the first set of regressions, though, I also examined the odds and predicted probabilities of respondents reporting ill-health by current legal status (noncitizen versus citizen). This allowed for the investigation of the influence of citizenship on health since all respondents were LPRs at the first survey, but some progressed to citizens by the second survey.

In both sets of analyses, I assessed the dimensions of legal status individually. That is, I modeled initial authorization classification, LPR admission category, and citizenship separately so that I could evaluate the unique effect of each dimension. For each model, I added covariates in a stepwise manner. Model 1 includes only the independent variable (initial authorization classification, LPR admission category, or citizenship) and the dependent variable (having a chronic condition). Model 2 adds gender, age, education, degree received between survey waves (in the longitudinal analyses) and race. Model 3 includes these sociodemographic covariates plus marital and employment status. Finally, Model 4 adds variables related migration history (region of origin and duration of residence). The analytic sample includes respondents with complete data for both survey waves. I utilized listwise deletion to exclude respondents with missing data on any of the examined variables, which results in an analytic sample of 3847. I conducted all analyses in STATA-14 using the NIS sample weights, which adjust for the oversampling of immigrants with employment visas.

3.3    Results

3.3.1   Descriptive Statistics

Table 5 displays the weighted descriptive statistics by survey wave. Over half of the

sample were women (57.38 percent), with an average age of 38.86 years at wave 1. Most

respondents had less than a high school education (35.52 percent). Just over 14 percent of

respondents received an additional degree between survey waves. The majority of respondents

were married and employed at both waves. Latin America was the most frequently reported

region of origin (47.25 percent) and a Latinx identity was the most commonly indicated

race/ethnicity (42.41 percent). A plurality of respondents initially entered the U.S. as temporarily

documented immigrants (40.05 percent), followed by permanently documented immigrants

(34.54 percent). A majority of respondents received their LPR status through family preference

(56.30 percent). Of the 3847 respondents, nearly 8 percent became U.S. citizens by the second

wave of the survey. Physical ill-health increased between survey waves, with 16.91 percent of

respondents reporting at least one physical health condition in wave 1 and 26.06 percent in wave

2.

[TABLE 5 HERE]


3.3.2   Legal Status and Health at Baseline

Table 6 presents results for initial authorization classification and physical health at wave

1. Figure 6 displays the correspondent predicted probabilities. In Model 1, with no covariates

present, only immigrants who entered the U.S. temporarily documented had significantly higher

odds of having a physical health condition relative to those who entered the U.S. permanently

documented ($p<0.05$). Once I added sociodemographic variables, this disadvantage in health

extended to immigrants who entered the U.S. undocumented. In the fully adjusted model, temporarily documented and undocumented immigrants had 47 and 51 percent higher odds of experiencing physical ill-health, respectively ($p<0.01$ for documented; $p<0.05$ for undocumented), compared to immigrants who entered the country permanently documented. This translated to a 11.11 percent probability of having a chronic condition among permanently documented immigrants compared to over a 15 percent probability among temporarily documented and undocumented immigrants.

[TABLE 6 HERE]

[FIGURE 6 HERE]

The eligibility category through which respondents obtained LPR status also predicted health at baseline. As shown in Table 7, Model 4, employment ($p<0.05$), refugee ($p<0.001$), and legalization ($p<0.001$) immigrants had significantly higher odds of having a chronic condition compared to family preference immigrants. Although diversity or other immigrants exhibited lower odds of reporting a health condition in Model 1, the sociodemographic covariates reduced this advantage to insignificance. As Figure 7 depicts, diversity or other immigrants had the lowest predicted probability of having a chronic condition at baseline (10.62 percent), followed by family preference (12.24 percent), employment (16.64 percent), legalization (22.31 percent), and refugee (23.25 percent) immigrants.

[TABLE 7 HERE]

[FIGURE 7 HERE]

3.3.3  Legal Status and Health over Time

Table 8 and Figure 8 present results for the relationship between authorization classification and physical health over both waves of the survey. Odds of having a chronic condition did not significantly differ by initial authorization classification in the models with no covariates (Table 8, Model 1) or all sociodemographic and migration history covariates (Table 8, Model 4). Temporarily documented and undocumented immigrants exhibited higher odds of having a chronic condition compared to permanently documented immigrants (Table 8, Models 2 and 3), but these relationships became insignificant when accounting for factors related to migration history. As Figure 8 shows, permanently documented, temporarily documented, and undocumented respondents all had similar predicted probabilities of having a chronic condition over time.

[TABLE 8 HERE]

[FIGURE 8 HERE]

Disparities emerged when analyzing physical health by LPR admission category, as shown in Table 9 and Figure 9. Without covariates (Table 9, Model 1), employment ($p<0.01$) and diversity or other ($p<0.001$) immigrants had significantly lower odds and refugee ($p<0.001$) and legalization ($p<0.01$) immigrants had significantly higher odds of having a chronic condition relative to family preference immigrants. With the addition of sociodemographic covariates, employment and diversity or other immigrants demonstrated higher odds of having a chronic condition compared to family preference immigrants, but the differences were not significant. However, with the addition of variables related to migration—region of origin and duration of residence in the U.S.—the elevated odds of having a chronic condition among diversity or other immigrants became significant ($p<0.05$). In the fully adjusted model, refugees exhibited the

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highest probability of having a chronic condition over time (26.17 percent), followed by

legalization (23.38 percent), diversity or other (19.40 percent), employment (16.87 percent), and,

lastly, family preference (16.27 percent) immigrants.

[TABLE 9 HERE]

[FIGURE 9 HERE]

Table 10 and Figure 10 present results for the relationship between citizenship and

physical health over time. In all but one model (Table 10, Model 2), citizens demonstrated

significantly lower odds of reporting a chronic condition compared to noncitizens over time.

After accounting for all sociodemographic and migration history characteristics, citizens had a

13.93 percent probability of having a chronic condition, while noncitizens had an 18.60 percent

probability (Figure 10).

[TABLE 10 HERE]

[FIGURE 10 HERE]

3.4     Discussion and Conclusion

All three dimensions of legal status examined in this paper were associated with health.

In terms of initial authorization classification, immigrants who entered the U.S. permanently

documented were the most advantaged in health at baseline. This finding indicates that the

privileges of LPRs in the legal status stratification scheme (Jasso 2011), as well as the more

stringent eligibility criteria, translated to a preliminary health advantage. However, the health

advantage of initial permanently documented immigrants faded over time. In the longitudinal

analyses, permanently documented immigrants were no more or less likely to have a chronic

condition than previously temporarily documented and undocumented respondents. This pattern

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indicates that the health advantages of initial permanently documented status did not endure over time, after all immigrants in the sample obtained permanent residency.

A convergence of health between immigrants of different initial authorization classifications aligns with prior research that demonstrates a worsening of immigrant health over time and eventual parity with native-born Americans' health (Cunningham, Ruben, and Venkat Narayan 2008). Abundant factors contribute to this trend of declining health, including changes in health behaviors, acculturative stress, erosion of social ties, work hazards, and discrimination (Oza-Frank, Stephenson, and Narayan 2011; Uretsky and Mathiesen 2007; Viruell-Fuentes 2007). While immigrants of different legal statuses likely experience these factors to varying extents, the present study may not have been able to capture these disparities due to the fact that all respondents were LPRs at the time of first survey completion. Perhaps a sample of immigrants with more diverse current authorization classifications would exhibit enduring disparities in health. Future research should explore these and other possible explanations for the observed health patterns by authorization classification.

Conversely, temporarily documented and undocumented immigrants experienced higher probabilities of reporting a chronic condition at wave 1 of the survey. Over time, though, odds of having a chronic condition did not differ by initial authorization classification in the fully adjusted model. Although undocumented immigrants had the highest probability of reporting a chronic condition at baseline, they had the lowest probability over time. In contrast, temporarily documented immigrants had the highest probability of reporting a chronic condition over time. Additional analyses (not shown) demonstrated that the difference in odds of having a chronic condition between the temporarily documented and undocumented groups was not significant in either the baseline or longitudinal analyses. On the one hand, this was a surprising finding for the

previously undocumented group, given the heightened stress and health risks linked to unauthorized status (Cabral and Cuevas 2020). However, this lack of association aligns with the majority of extant empirical studies that examine the relationship between authorization classification and physical health (Hamilton, Hale, and Savinar 2019).

Misclassification of initial authorization status and/or underestimation of the stressors associated with temporary and conditional visas may partially explain why previously documented immigrants had odds of ill-health similar to previously undocumented immigrants. First, there may be immigrants in the temporarily documented category who entered the U.S. with valid documents who transitioned into undocumented status. In the present study, authorization classification captured legal status upon entry into the U.S. The undocumented category therefore encompassed immigrants who entered the country without documents or with fraudulent documents, but not those who became undocumented by overstaying a temporary visa or working without authorization. The misclassification of respondents with previous undocumented experience as temporarily documented may obscure some of the differences between the two groups given that the stress of being unauthorized, even briefly, can have enduring health effects (Martinez et al. 2015; Cavazos-Rehg, Zayas, and Spitznagel 2007; Torres and Young 2016).

Second, it may also be that the stress of attaining non-permanent documented statuses, which include temporary or conditional visas, may be underestimated in the literature. That is, achieving such documented statuses means being on the radar of immigration officials and thus navigating bureaucratic application processes and adhering to specific guidelines such as paying taxes, submitting up-to-date home addresses, and observing visa expiration dates. These factors can cause stress due to the perception of being tracked and potentially caught failing to meet the

plethora of regulations. They also create a sense of uncertainty for temporary and conditional

visa holders that can last years and restrict their range of action in different spheres of life, from

the labor market to their social network (Menjívar 2006). Legal status stress in turn erodes health

(Cavazos-Rehg, Zayas, and Spitznagel 2007; Finch and Vega 2003). Therefore, although

immigrants without documents face similar stressors related to having tenuous claims to

residence in the U.S., immigrants with temporary or conditional documents may experience

stressors unique to their authorization classification as well. As the present study demonstrates,

these stressors can have a substantial influence on health.

In contrast, LPR admission category was consistently associated with health. At baseline,

findings revealed a gradient of health advantage favoring immigrants who obtained LPR status

through diversity or other criteria, followed by those with eligibility through family preference,

employment, legalization, and, lastly, refugee criteria. Over time, disparities in health dissipated

for employment immigrants, but remained or worsened for diversity or other, legalization, and

refugee immigrants. Notably, LPR admission type reflects the health selectivity of immigrants

and therefore likely contributes to the disadvantaged health of legalization and refugee

immigrants. Specifically, elevated rates of chronic illness may result from the persistent stress of

legalization immigrants' previous undocumented experience and refugees' exposure to violence

and unrest in their home country. Although likely a consequence of both health selection and

ensuing health stratification processes, I was unable to evaluate the role of health selection in

generating the observed disparities in the present study. Research should continue to assess the

distinct contributions of factors prior and subsequent to migration on immigrant health.

In addition to health selection, the legal status stratification system also generates

disparities in health among immigrants over the life course. All respondents in the present study

attained LPR visas before the first interview, so it is probable the respondents' prior legal status produced some of the observed disparities in health. LPR admission categories may be especially consequential for immigrant health because they signify policies that stipulate who is eligible to migrate, what resources are available to them, and how they are able to navigate paths to LPR status or citizenship (Morey et al. 2020). As a key dimension of legal status, visa type impacts social integration, exposure to stressors, socioeconomic opportunities, work conditions, access to health-promoting services (Jasso 2011; Kreisberg 2019; Morey et al. 2020; Obinna 2014), and the subsequent health trajectories of immigrants. For instance, the socioeconomic resources afforded to employment immigrants may have contributed to their improvement in physical health relative to family preference immigrants over time. On the other hand, the labor market is particularly unfavorable to workers with undocumented or refugee experience (Kreisberg 2019), which constrains legalization immigrants' and refugees' socioeconomic prospects. The current results reveal that differential exposure to health risks and access to resources produces, or at least exacerbates, health disparities by LPR admission category.

Consistent with expectations and previous findings (Campbell et al. 2012; Van Natta et al. 2019), citizenship predicted the health of immigrants in this sample as well. Specifically, respondents who became citizens by the second wave of the survey exhibited lower odds of having a chronic condition. Although all respondents in the sample were LPRs, becoming a citizen is accompanied by social, civil, economic, and health privileges above and beyond legal authorization. Citizenship accords immigrants higher incomes (Pastor and Scoggins 2012) and better access to healthcare (Goldman, Smith, and Sood 2005). It also alleviates stress related to fear of deportation and provides a sense of stability not afforded to those with undocumented or other documented statuses. Therefore, as researchers have previously argued (*e.g.*, Castañeda et

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al. 2015; Miranda et al. 2017; Viruell-Fuentes 2007), citizenship is a fundamental social determinant of health that warrants further attention.

Overall, the present research promotes the conceptualization of legal status as dynamic and multidimensional, comprised of several sociopolitical dimensions that shape immigrant health. This is because various legal statuses stratify immigrants into a hierarchy of privilege, with ramifications for their well-being over the life course. The findings of this study illuminate the lasting associations of legal status with health. All three dimensions of legal status examined—initial authorization classification, LPR admission category, and citizenship— predicted the physical health of immigrants at some point in time. However, LPR admission category and citizenship appeared to be the dimensions most consistently associated with health. Some groups, including immigrants who obtained citizenship and permanent residency through employment criteria, bettered their health prospects over time, while others, including immigrants with previous legalization or refugee experience, exhibited continual disadvantage in the hierarchy of immigrant health. Thus, multiple dimensions of legal status have enduring consequences for health because they constrain immigrants' transitions into migration as well as propel them down divergent trajectories of integration.

**CHAPTER 4**


**Persistent Mental Health Disadvantage among Refugee Women in the U.S., 2003-2009**


4.1     Background

Visa categories reflect immigrants' prior life chances and accessible resources associated with health (Morey et al. 2020). As such, previous research demonstrates variability in health selection into migration, with family preference and refugee immigrants less likely to experience positive health selection compared to employment immigrants (Akresh and Frank 2008). For refugees, this pattern of relative ill-health can be partially attributed to their heightened exposure to war and/or political violence (Scoglio and Salhi 2020), which increases risk for developing mental health symptoms and disorders (Fazel, Wheeler, and Danesh 2005; Lindert et al. 2009; Steel et al. 2009). However, disparities in health by visa categories do not cease upon settlement in a new country. Both refugee and non-refugee immigrants report high levels of stress and trauma exposure before, during, and after the migratory transition, which results in mental illness and distress (Perreira and Ornelas 2013; Sangalang et al. 2019), particularly for women (Hollander et al. 2011; Schubert and Punamäki 2011; Smith et al. 2007). Beyond health selection, social forces post-migration shape refugee and immigrant health, yet they are rarely empirically examined. In the present study, I show that the mental health trajectories of immigrants diverge by two socially-embedded factors—visa category, specifically refugee status, and gender—over time.

Consistent with some prior research (e.g., Akresh and Frank 2008), I utilize the term visa category to refer to the criteria through which immigrants received their legal permanent

residence (LPR) visas. There are a variety of visa categories, including family preference, employment, and refugee classifications. To be eligible for a LPR visa through family preference criteria, an individual must have a U.S. citizen or green card-holding family member already in the U.S. (USCIS 2020), which necessitates strong social ties (Kreisberg 2019). Obtaining LPR through employment criteria requires an employer sponsor and, often, a high level of education (USCIS 2020). Lastly, an immigrant is eligible for LPR through refugee status if they meet government-recognized humanitarian criteria, such as facing serious harm in their home country (USCIS 2020). Refugee status does not mandate other social, financial, or educational requirements (Office of Refugee Resettlement 2020).

Prior research establishes that refugees tend to exhibit higher rates of depression, anxiety, and post-traumatic stress disorder than non-refugee immigrants and the general population (for reviews see Fazel et al. 2005; Lindert et al. 2009). Factors such as racial/ethnic stratification, discrimination, language barriers, and social isolation influence the resources available to refugees, and their subsequent well-being. For example, refugees exhibit worse mental health when living in institutional housing accommodations and experiencing restricted economic opportunity (Porter and Haslam 2005). These post-migration circumstances can have an effect on refugee mental health equivalent to or even greater than pre-migration experiences (Hynie 2018; Kim 2016; Porter and Haslam 2005; Sangalang et al. 2019).

Rarely do emerging accounts of adult refugee mental health in the post-migration context assess health over time. One study demonstrates that refugees in Australia who obtained permanent residence status experienced improvements in terms of post-traumatic stress disorder, anxiety, depression, and mental health functioning over time compared to immigrants whose applications for asylum were denied (Silove et al. 2007). Thus, the institutional conferral of legal

statuses has the potential to critically shape immigrant health. While it is known that refugees tend to have worse mental health relative to non-refugees, it is unclear how long they may experience this suffering lasts post-resettlement (Williams and Thompson 2011). This knowledge is vital in ensuring that resources remain accessible to refugees for as long as needed (Williams and Thompson 2011).

Also uncommon are longitudinal assessments that examine gender differences in refugees' mental health. Amongst refugees in Australia, post-resettlement socioeconomic stressors and loneliness are positively associated with mental ill-health for both men and women (Wu et al. 2021). Additionally, reunification with a family member is associated with improved mental health for both men and women refugees in Germany (Löbel and Jacobsen 2021). In contrast, difficulties in adjustment to life in Australia predicts worse mental health for men, but not women, and this association increases in strength over the years of resettlement (Wu et al. 2021).

It is imperative to assess gender differences in refugee experiences and mental health given that mental health is patterned by gender amongst the general population globally (Seedat et al. 2009) and amongst immigrant populations specifically (Schubert and Punamäki 2011; Smith et al. 2007). Elevated risk of mental ill-health is also apparent among refugee women relative to non-refugee immigrant women in Sweden, but the same pattern is not found among refugee men (Hollander et al. 2011). Refugee women may be particularly vulnerable to mental health problems due to lower socioeconomic status, lack of English language skills or formal education, and experience of sexual violence relative to refugee men (Deacon and Sullivan 2009; Friedman 1992; Smith et al. 2007). The present study adds to this body of research by examining how the mental health of refugees compares to the mental health of family preference and other

immigrants over time among a nationally-representative sample of immigrants to the U.S. Another contribution of the present study to extant literature is the consideration of gender, particularly the experience of being a woman, as an important social factor that shapes the mental health experiences of refugees.

4.2     Theoretical Framework

Research that assesses refugee health over time is markedly limited. Nonetheless, the life course perspective provides a useful framework for analyzing visa categories, gender, and health because it explores how earlier phases of life influence later ones, as well as how larger social forces shape the trajectories of people's lives (Elder 1975), often according to the social groups to which individuals belong (Elder 1998; Torres and Young 2016). For example, different visa categories result in divergent labor market trajectories even after immigrants obtain the same status as LPRs, with a hierarchy of labor market advantage favoring employment visa holders over those with refugee experience (Kreisberg 2019). Moreover, studies that incorporate measures of duration of residence reveal an erosion in health among immigrants over time (Acevedo-Garcia et al. 2010; Cunningham, Ruben, and Venkat Narayan 2008). Behavioral changes, work hazards, acculturative stress, loss of social ties, and discrimination contribute to this pattern (Uretsky and Mathiesen 2007; Viruell-Fuentes 2007), particularly in terms of an erosion in mental health (Hovey and Magaña 2000; Leong, Park, and Kalibatseva 2013; Vega, Kolody, and Valle 1987). The present study expands this literature to assess the role of visa category on mental health trajectories for immigrants overall and for women specifically.

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4.3     Methods

4.3.1   Data

I utilized data from two waves of the New Immigrant Survey (NIS), a publicly available and nationally representative (n=8,573) longitudinal survey of immigrants aged 18 years and older who obtained lawful permanent residence (LPR) status. The sampling frame used administrative records of new immigrants who entered the U.S. or adjusted their legal status from May-November 2003. The first interview occurred during 2003 and 2004, immediately after respondents received LPR status, and the second interview happened five years later between 2007 and 2009 (Jasso et al. 2006). Response rates were 69 and 46 percent in the first and second waves, respectively.


4.3.2   Measures

The dependent variable was an overall, dichotomous indicator of diagnosed mental illness, as reported by respondents. Individuals were specifically asked if a doctor ever told them they had an emotional, nervous, or psychiatric problem (1=presence of a mental illness, 0=absence of a mental illness).

The primary independent variable was visa category, or the class of eligibility that qualified respondents for admission to LPR status: family preference (reference), employment and other visa categories, and refugee. The employment and other category includes employment immigrants (35.66 percent), diversity immigrants (30.47 percent), legalization immigrants (16.41 percent), and respondents who received LPR status through other, undisclosed, criteria and/or visa types (17.46 percent). Including separate employment, diversity, legalization, and other visa

categories in the models would substantially reduce the power of the analyses; therefore, I used the more parsimonious employment and other classification.

Models controlled for sociodemographic and migration characteristics associated with health, including age (in years), race/ethnicity (Latine, non-Latine white, and non-Latine other race), education (less than high school, high school or some college, and college degree or higher), marital status (1=married or living with a partner, 0=never married, separated, divorced, or widowed), employment status (1=currently employed, 0=else), region of origin (Latin America, Asia, or other), duration of residence in the U.S. (in years), and exposure to pre-migration trauma (1=yes). In non-gender stratified models, I also controlled for gender (1=woman, 0=man). In the longitudinal analyses, I included whether an additional educational degree was received between survey waves (1=yes).

### 4.3.3   Analytic Strategy

First, I estimated differences in mental health by visa category and gender at baseline, immediately after respondents obtained LPR, using multivariate logistic regressions. Second, I calculated odds of mental health by visa category and gender over time, approximately five years after all immigrants in the sample achieved the same legal status as LPRs, using random-effects multivariate logistic regressions. This second set of regressions included an error term to account for the longitudinal nature of the data. Models controlled for sociodemographic (gender, age, race/ethnicity, education, employment status, and marital status) and migration characteristics (region of origin, duration of residence, and pre-migration trauma).

The analytic sample included respondents with complete data for both survey waves. I utilized listwise deletion to exclude respondents with missing data on any of the examined

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variables, which resulted in an analytic sample of 3545. All analyses used STATA-14 software and made use of the NIS sample weights to adjust for the oversampling of individuals who obtained LPR status through employment visas.

4.4     Results

4.4.1   Descriptive Statistics

Table 11 displays the weighted descriptive statistics by survey wave and by sample (total sample and women only). The prevalence of mental illness increased from 1.92 to 3.69 percent between survey waves in the total sample. The prevalence of mental illness was higher among women and increased from 2.46 to 4.79 percent. The majority of respondents received their LPR status through family preference criteria (55.29 percent in total sample; 62.16 percent among women). Over half of the total sample were women (58.87 percent), with an average age of just above 38 years at wave 1. Most respondents had a high school degree or some college (36.36 percent in total sample; 37.10 among women), although people with less than a high school education also made up a sizeable portion of the sample (34.55 percent in total sample; 35.82 percent among women). Between survey waves, 14.94 percent of all respondents and 16.92 percent of women received an additional educational degree. The majority of individuals were married at both interviews.  While a majority of all respondents were employed at both waves, a minority of women were employed at wave 1. Respondents most commonly indicated a region of origin in Latin America (46.25 percent in total sample; 47.62 percent among women) and a Latinx identity (41.44 percent in total sample; 42.90 percent among women), and the average duration of residency was over 5 years at baseline. Pre-migration trauma was reported by 7.93 percent of the total sample, and 6.35 percent of women.

[TABLE 11 HERE]

4.4.2   Visa Category and Mental Illness

Table 12 presents results for odds of mental illness by visa category at baseline, for the total sample (Model 1) and women only (Model 2). Employment or other immigrants did not experience significantly different odds of being diagnosed with a mental illness than family preference immigrants in either model. However, refugee immigrants exhibited greater odds of mental illness compared to family preference immigrants in both models. In the total sample, refugees had 3.12 times higher odds of reporting a mental illness ($p<0.01$), while refugee women had 4.32 times higher odds of reporting a mental illness compared to their family preference immigrant counterparts ($p<0.01$).

[TABLE 12 HERE]

Table 13 presents results for the relationship between prior legal status and mental illness over both waves of the survey, again for the total sample (Model 1) and for women (Model 2). Odds of mental illness for employment or other immigrants again did not substantially differ from the odds for family preference immigrants in either model. In contrast to findings at baseline, refugees' odds of mental illness were also not statistically different from the odds of family preference immigrants in the total sample. Disparities in odds of having a mental illness remained stark for refugee women, though. Refugee women exhibited 4.14 times higher odds of reporting a mental illness relative to family preference immigrant women over time ($p<0.05$).

[TABLE 13 HERE]

4.5     Discussion and Conclusion

Visa category and gender appear to shape the mental health of immigrants over time. At baseline, refugees exhibited a disadvantage in mental health relative to family preference immigrants. These results align with prior research, which establishes that refugees tend to display higher rates of depression and anxiety compared to non-refugee immigrants (Lindert et al. 2009). Over time, this disparity in mental illness attenuated for the total sample of refugees but remained for refugee women, despite accounting for health-eroding experiences such as pre-migration trauma. This gendered pattern among refugees parallels previous work in Sweden (Hollander et al. 2011). Importantly, post-migration circumstances can have an equal or larger effect on refugee mental health than pre-migration experiences (Hynie 2018; Kim 2016; Porter and Haslam 2005; Sangalang et al. 2019). These findings demonstrate that socially-embedded factors such as visa category and gender intersect to influence immigrant mental health outcomes.

On the one hand, the legal status stratification system is a mechanism that continuously affects immigrant health over the life course. As a critical aspect of legal status, visa categories result from an institutional system that regulates immigrants' transition into migration and influences their subsequent social integration, socioeconomic opportunities, work conditions, and access to health-promoting services (Jasso 2011; Kreisberg 2019). The present study demonstrates that this differential exposure to risks, resources, and stressors is associated with disparities in mental illness by visa category. For example, family preference immigrants' social support in the U.S. and employment immigrants' ties to the labor market afford them access to crucial social assets. In contrast, refugees often lack social support in the U.S. and encounter a labor market that is particularly unfavorable to workers with refugee experience (Kreisberg

2019), which impairs their access to health-promoting resources. Given the gendered patterns of employment among respondents in the present sample, refugee women may be particularly disadvantaged in the U.S. labor market. Lower socioeconomic status, lack of English language skills or formal education, and experience of sexual violence may exacerbate inequalities in employment and also contribute to refugee women's heightened levels of mental illness (Deacon and Sullivan 2009; Friedman 1992; Smith et al. 2007).

The mental health disadvantage experienced by refugee women over time is critical to address, for women themselves as well as their families. Refugee women often serve as caregivers of the family and protectors of traditions and culture, meaning that their well-being intimately influences the well-being of entire families and future generations (Kuoch, Wali, and Scully 1992). Yet, current social services do not adequately attend to the needs of refugee women, as demonstrated by their continual disadvantage in mental illness. While refugees are eligible for state services such as social welfare and employment counselors, these resources are only available for two years (Office of Refugee Resettlement 2019). Findings from the present study indicate that extending refugee resettlement services beyond the current two-year limit, and providing additional cost-free mental health resources, may help address the observed disparities in mental illness by visa category and gender.

Although the age of the data is a limitation, the NIS provides a uniquely rich data source due to its longitudinal design. Nevertheless, I was not able to assess the extent to which health disparities ensued from health selection prior to migration to the U.S. Future research should explore the extent to which health selection and health trajectories differentially affect immigrants by legal status. Moreover, the measure of pre-migration trauma may not capture all distressing experiences survived by immigrants. For example, the survey asks if respondents ever

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experienced harm outside of the U.S. due to their gender, but does not specifically refer to instances of sexual violence. Therefore, respondents may interpret the question differently, and the level of trauma experienced by women may be underestimated. Lastly, I measured mental health as an overall indicator of diagnosed mental illness, as reported by respondents. This operationalization is limited because it necessitates (a) a physician diagnosis, and (b) participant disclosure. Assessing mental health through psychological symptom screenings is therefore a fruitful endeavor for future research since it eliminates the structural barriers of healthcare access and utilization.

Findings from the present study suggest that the post-migration sociopolitical context has enormous potential in determining if exposure to stressful and traumatic events generate or exacerbate mental health problems. Mental health disparities persist 5+ years after all individuals in the sample achieved the same legal status as permanent residents. This indicates that the services provided to refugees are not sufficient in eliminating inequalities in mental health; indeed, current policies may even be exacerbating disparities in health for refugee women. It is time for policymakers and mental health providers to reevaluate refugee health services for women in particular so as not to "revictimize this population with diagnoses and treatment that ignore the trauma and are used only to maintain the status quo" (Kuoch et al. 1992:xii).

# CHAPTER 5

## Conclusion

The present research set out to assess how two interconnected structural forces—the criminal legal system and the immigrant legal status system—shape immigrant health. Results revealed substantial variation in immigrant health based on socially-embedded factors such as incarceration status, race/ethnicity, citizenship, visa category, and gender. The first empirical chapter bridged immigration and punishment literature to investigate if the immigrant health advantage extended to prisoners given the differential treatment of noncitizens and racial/ethnic minorities by the criminal legal system. It established evidence that the immigrant health advantage is generally weaker among incarcerated individuals than among the non-incarcerated population, although results varied markedly by socially-embedded characteristics such as race/ethnicity and citizenship. These findings implicate mass incarceration as a system that undermines the health of immigrants caught in its domain. Thus, the criminal legal system may constitute one countervailing mechanism in the production of immigrant health.

The second and third empirical chapters then challenged the dichotomous and static conceptualization of legal status to assess variation in health across immigrant groups. Results confirmed that legal status stratifies immigrants into a hierarchy of privilege, with ramifications for their well-being over the life course. Multiple dimensions of legal status, including LPR admission category and citizenship, have enduring consequences for health because they shape individuals' transitions into migration as well as generate divergent trajectories of integration. Immigrants with refugee experience are most notably disadvantaged in this hierarchy of privilege, especially refugee women. As such, various aspects of legal status beyond the common

documented/undocumented or citizen/noncitizen dichotomies are associated with unique stressors and access to resources, which in turn influence health. These results point to the need for improved social and health services for immigrants, even after they have obtained legal permanent residency. Services tailored to the experiences of refugees, particularly women, are most critically needed.

Overall, this dissertation sheds light on disparities in health among specific populations such as incarcerated immigrants, authorized noncitizens, and refugee women. The disadvantaged health of individuals at these intersections of marginality belies the notion of a universal immigrant health advantage. As such, if the immigrant health advantage is taken as a social fact, it is highly misleading. It does not take into adequate account the heterogeneity within and between various immigrant populations, the divergent applicability to different health outcomes, the dynamic nature of legal status, nor the experiences of especially marginalized immigrant groups such as the incarcerated. Instead, the variable experiences of immigrants highlight the enormous power of structural forces in stratifying population health and well-being along socially-determined lines.

When researchers examine the immigrant health advantage using survey data from a standard survey of the non-institutionalized population or binary measures of legal status, findings portray patterns in health that do not exist for many individuals. This dissertation provided initial steps to address these shortcomings in extant studies and emphasized the importance of questioning taken-for-granted phenomena and the crucial role that data plays in shaping our sociological research and knowledge. As social scientists, it is our imperative to illuminate such previously hidden disparities so that properly-informed policies can address the inequalities entrenched in our legal systems.

Table 1. Weighted Descriptive Statistics for National Health Interview Survey (NHIS 2016) and Survey of Prison Inmates (SPI 2016)

| | Non-incarcerated | | Incarcerated | |
|---|---|---|---|---|
| | Native-born | Foreign-born | Native-born | Foreign-born |
| Gender (1=woman, %) | 51.79 | 52.09 | 7.40 | 3.84*** |
| Age (%) | | | | |
|   18-34 years | 31.08 | 27.72** | 42.05 | 34.82*** |
|   35-49 years | 22.88 | 34.01*** | 37.05 | 43.44*** |
|   50+ years | 46.03 | 38.27*** | 20.90 | 21.74 |
| Education (%) | | | | |
|   Less than high school | 9.27 | 24.84*** | 61.36 | 65.15** |
|   High school | 25.56 | 21.63*** | 23.03 | 19.30*** |
|   Some college | 33.57 | 20.44*** | 11.76 | 9.29*** |
|   College degree or more | 31.60 | 33.09 | 3.85 | 6.25*** |
| Race (%) | | | | |
|   White | 75.71 | 18.91*** | 33.35 | 6.59*** |
|   Black | 12.81 | 8.86*** | 36.59 | 6.90*** |
|   Other race | 2.88 | 24.93*** | 13.70 | 7.89*** |
|   Latine | 8.59 | 47.30*** | 16.46 | 78.62*** |
| US citizen (%) | 100.00 | 54.61 | 100.00 | 32.44*** |
| Health Outcomes | | | | |
|   Number of Chronic Conditions[a] (%) | | | | |
|     0 conditions | 43.27 | 60.03*** | 49.86 | 62.94*** |
|     1 condition | 27.40 | 22.24*** | 28.46 | 22.53*** |
|     2 conditions | 15.26 | 9.67*** | 12.92 | 8.03*** |
|     3 conditions | 8.77 | 5.40*** | 5.42 | 4.64 |
|     4 or more conditions | 5.30 | 2.66*** | 3.33 | 1.86*** |
|   Diabetes (%) | 9.58 | 9.71 | 7.79 | 8.61 |
|   Hypertension (%) | 31.61 | 24.76*** | 29.48 | 22.90*** |
|   Heart condition (%) | 12.18 | 6.50*** | 7.18 | 5.43** |
| Sample size | 27345 | 4456 | 21723 | 2402 |
| Weighted N | 192671090 | 43497538 | 1245201 | 131295 |

Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.

Notes: Respondents in the white, black, and other race categories identify as non-Latine. *Indicates significant difference from native-born, same incarceration status sample at the 0.05 level, **0.01 level, and ***0.001 level. Tests are two-tailed.

[a] Number of chronic conditions is an index count that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table 2. Nativity Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 National Health Interview (NHIS) Sample, 2016 Survey of Prison Inmates (SPI) Sample, and Combined 2016 NHIS and 2016 SPI Samples

| | | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|---|
| | | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Model 1: NHIS Sample (n=31801) | Foreign-born | 0.72*** | [0.67-0.76] | 0.85 | [0.71-1.01] | 0.70*** | [0.61-0.79] | 0.64*** | [0.53-0.78] |
| | Race/ethnicity (ref=white) | | | | | | | | |
| | Black | 1.09*** | [1.04-1.14] | 1.70*** | [1.47-1.97] | 1.71*** | [1.52-1.92] | 0.79** | [0.68-0.92] |
| | Other race | 0.92* | [0.85-0.99] | 1.29* | [1.01-1.65] | 1.11 | [0.93-1.32] | 0.65** | [0.49-0.86] |
| | Latine | 0.90** | [0.84-0.96] | 1.48*** | [1.23-1.79] | 0.97 | [0.84-1.11] | 0.66*** | [0.54-0.82] |
| Model 2: SPI Sample (n=24125) | Foreign-born | 0.73*** | [0.67-0.80] | 0.90 | [0.72-1.13] | 0.73*** | [0.64-0.85] | 0.78 | [0.60-1.01] |
| | Race/ethnicity (ref=white) | | | | | | | | |
| | Black | 0.98 | [0.94-1.03] | 1.25** | [1.07-1.47] | 1.47*** | [1.34-1.62] | 0.67*** | [0.58-0.79] |
| | Other race | 1.16*** | [1.10-1.23] | 1.35** | [1.11-1.64] | 1.30*** | [1.15-1.46] | 1.06 | [0.88-1.28] |
| | Latine | 0.94* | [0.88-1.00] | 1.44** | [1.16-1.78] | 0.98 | [0.87-1.10] | 0.74** | [0.60-0.90] |
| Model 3: NHIS and SPI Samples, Combined (n=55926) | Incarcerated | 0.97 | [0.94-1.01] | 0.74*** | [0.66-0.84] | 0.91* | [0.83-0.99] | 0.70*** | [0.62-0.79] |
| | Foreign-born | 0.72*** | [0.67-0.76] | 0.85 | [0.71-1.01] | 0.70*** | [0.61-0.79] | 0.64*** | [0.53-0.78] |
| | Race/ethnicity (ref=white) | | | | | | | | |
| | Black | 1.08*** | [1.04-1.13] | 1.70*** | [1.47-1.96] | 1.70*** | [1.52-1.91] | 0.79** | [0.68-0.91] |
| | Other race | 0.92* | [0.85-1.00] | 1.29* | [1.02-1.65] | 1.11 | [0.94-1.31] | 0.65** | [0.50-0.86] |
| | Latine | 0.90** | [0.85-0.96] | 1.48*** | [1.23-1.79] | 0.97 | [0.84-1.11] | 0.67*** | [0.54-0.82] |

Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.
Notes: Weighted statistics. All models control for gender, age, and education. Combined incarceration status model also controls for incarceration status. Full models including incidence rate ratios and odds ratios for these controls can be found in the Appendix (Appendix Tables A1-A3). Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.
[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table 3. Nativity Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 Survey of Prison Inmates Sample, by Prison Type (n=24125)

| | | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|---|
| | | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Model 1: State Prison (n=19522) | Foreign-born | 0.83*** | [0.75-0.92] | 1.01 | [0.77-1.34] | 0.88 | [0.74-1.06] | 0.81 | [0.59-1.12] |
| | Race/ethnicity (ref=white) | | | | | | | | |
| | Black | 1.00 | [0.96-1.05] | 1.27** | [1.07-1.51] | 1.53*** | [1.39-1.70] | 0.70*** | [0.59-0.82] |
| | Other race | 1.16*** | [1.10-1.23] | 1.31* | [1.06-1.62] | 1.31*** | [1.15-1.48] | 1.06 | [0.87-1.29] |
| | Latine | 0.94 | [0.88-1.08] | 1.44** | [1.15-1.81] | 0.99 | [0.87-1.13] | 0.60* | [0.64-0.93] |
| | Gender (1=woman) | 1.28*** | [1.23-1.34] | 1.36*** | [1.16-1.60] | 0.94 | [0.86-1.04] | 0.98 | [0.83-1.16] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 1.76*** | [1.66-1.85] | 4.06*** | [3.18-5.19] | 2.61*** | [2.37-2.88] | 1.71*** | [1.40-2.08] |
| | 50+ years | 3.35*** | [3.18-3.53] | 11.55*** | [9.09-14.68] | 7.10*** | [6.38-7.91] | 6.04*** | [5.01-7.28] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.97 | [0.93-1.02] | 0.90 | [0.76-1.07] | 1.01 | [0.91-1.11] | 1.05 | [0.89-1.25] |
| | Some college | 1.05 | [1.00-1.12] | 1.05 | [0.86-1.28] | 1.11 | [0.98-1.25] | 1.37** | [1.12-1.67] |
| | College degree or higher | 1.14** | [1.04-1.24] | 1.34* | [1.01-1.78] | 1.16 | [0.94-1.41] | 1.39* | [1.04-1.86] |
| | Constant | 0.51*** | [0.48-0.54] | 0.02*** | [0.01-0.02] | 0.14*** | [0.13-0.16] | 0.04*** | [0.03-0.05] |
| | Inflate model constant | -2.11*** | [-2.30--1.91] | | | | | | |
| Model 2: Federal Prison (n=4603) | Foreign-born | 0.58*** | [0.51-0.67] | 0.70 | [0.47-1.03] | 0.50*** | [0.39-0.64] | 0.81 | [0.53-1.23] |
| | Race/ethnicity (ref=white) | | | | | | | | |
| | Black | 0.85** | [0.76-0.96] | 1.08 | [0.74-1.58] | 1.08 | [0.86-1.36] | 0.51** | [0.33-0.77] |
| | Other race | 1.15 | [1.00-1.31] | 1.69* | [1.09-2.63] | 1.19 | [0.89-1.60] | 1.13 | [0.73-1.74] |
| | Latine | 0.94 | [0.81-1.09] | 1.45 | [0.94-2.25] | 0.95 | [0.73-1.25] | 0.63 | [0.40-1.00] |
| | Gender (1=woman) | 1.39*** | [1.28-1.52] | 1.33* | [1.01-1.75] | 1.32** | [1.10-1.58] | 1.16 | [0.86-1.58] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 2.10*** | [1.83-2.39] | 5.60*** | [3.31-9.48] | 2.96*** | [2.38-3.69] | 1.85* | [1.11-3.09] |
| | 50+ years | 4.56*** | [3.97-5.23] | 16.50*** | [9.63-28.25] | 9.08*** | [7.05-11.69] | 7.93*** | [4.76-13.18] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.99 | [0.89-1.11] | 0.85 | [0.60-1.21] | 1.08 | [0.87-1.33] | 0.88 | [0.58-1.32] |
| | Some college | 1.10 | [0.98-1.24] | 1.09 | [0.76-1.58] | 1.06 | [0.84-1.35] | 1.43 | [0.95-2.15] |
| | College degree or higher | 0.90 | [0.78-1.03] | 0.83 | [0.53-1.28] | 0.89 | [0.67-1.18] | 0.94 | [0.60-1.46] |
| | Constant | 0.41*** | [0.35-0.48] | 0.01*** | [0.01-0.02] | 0.13*** | [0.10-0.18] | 0.03*** | [0.02-0.06] |
| | Inflate model constant | -1.85*** | [-2.21--1.49] | | | | | | |

Source: Author's calculations using data from the 2016 Survey of Prison Inmates.

Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.

[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Figure 1. Predicted Probabilities of Having a Chronic Condition[a] by Incarceration Status, Nativity, and Race/ethnicity (n=55926)
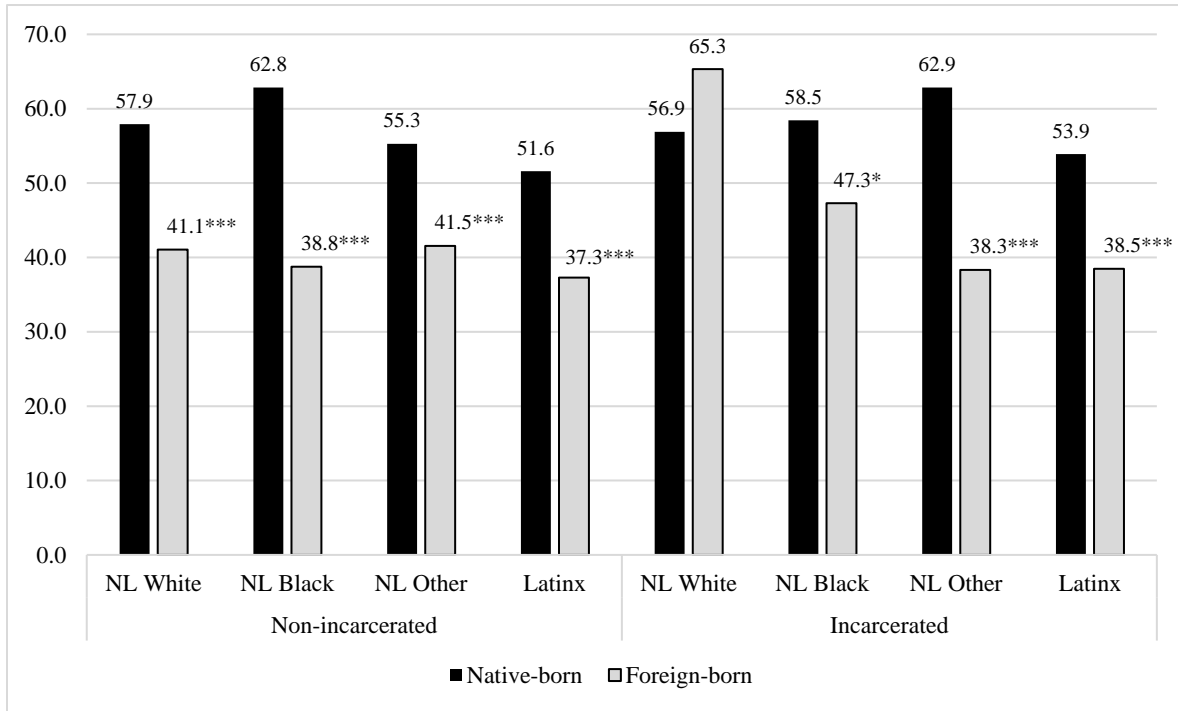


Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.
Notes: Weighted statistics. Models control for gender, age, and education. Full model with weighted coefficients can be found in Appendix Table A7, Panel A. *Indicates significant difference from native-born, same race/ethnicity, and same incarceration status sample at the 0.05 level, **0.01 level, and ***0.001 level, tests are two-tailed.
[a] 1=presence of any condition of the following conditions: diabetes mellitus, hypertension, heart condition, arthritis, asthma, cancer, and stroke.

Figure 2. Predicted Probabilities of Diabetes by Incarceration Status, Nativity, and Race/ethnicity (n=55926)
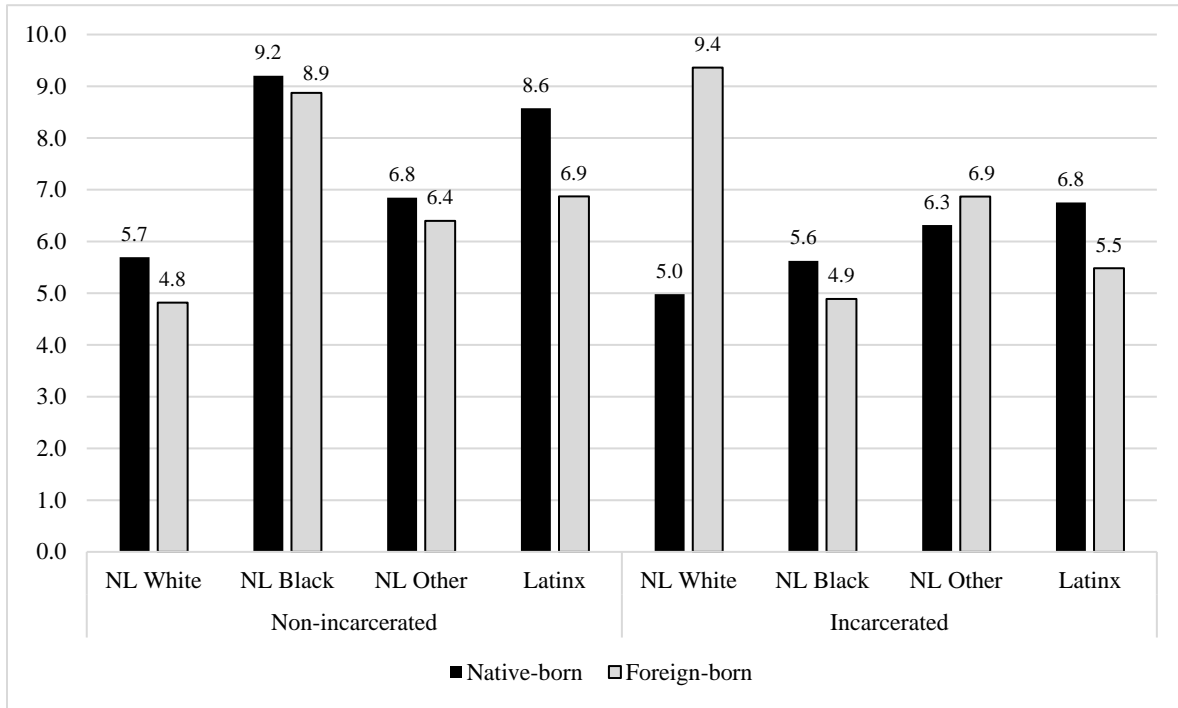


Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.
Notes: Weighted statistics. Models control for gender, age, and education. Full model with weighted coefficients can be found in Appendix Table A7, Panel B. Indicates significant difference from native-born, same race/ethnicity, and same incarceration status sample at the 0.05 level, **0.01 level, and ***0.001 level, tests are two-tailed.

Figure 3. Predicted Probabilities of Hypertension by Incarceration Status, Nativity, and Race/ethnicity (n=55926)
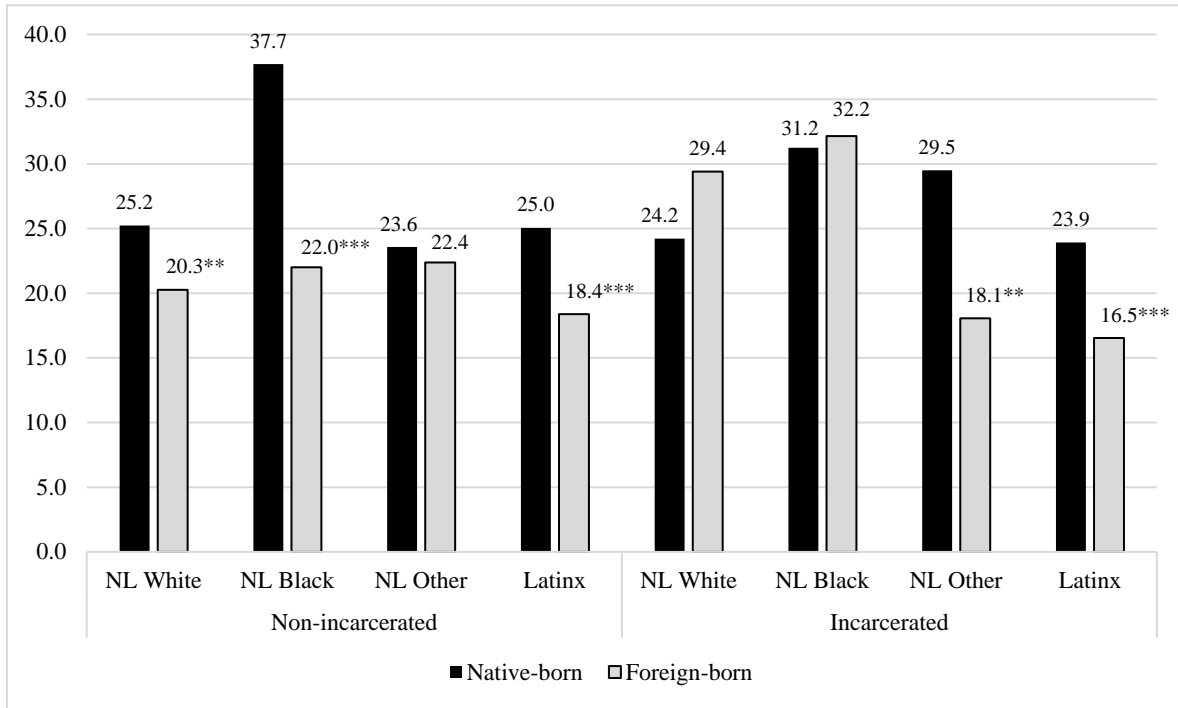


Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.
Notes: Weighted statistics. Models control for gender, age, and education. Full model with weighted coefficients can be found in Appendix Table A7, Panel C. *Indicates significant difference from native-born, same race/ethnicity, and same incarceration status sample at the 0.05 level, **0.01 level, and ***0.001 level, tests are two-tailed.

Figure 4. Predicted Probabilities of a Heart Condition by Incarceration Status, Nativity, and Race/ethnicity (n=55926)
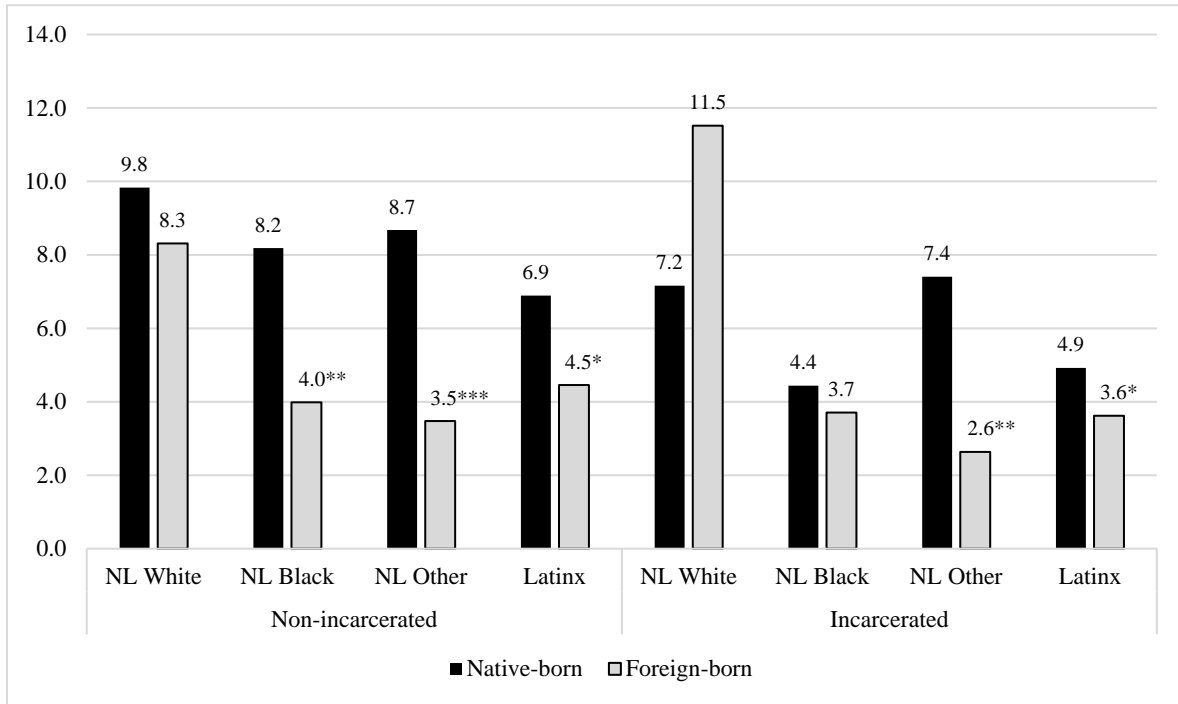


Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.
Notes: Weighted statistics. Models control for gender, age, and education. Full model with weighted coefficients can be found in Appendix Table A7, Panel D. *Indicates significant difference from native-born, same race/ethnicity, and same incarceration status sample at the 0.05 level, **0.01 level, and ***0.001 level, tests are two-tailed.

Figure 5. Predicted Probabilities of Having a Chronic Condition, Diabetes, Hypertension, and a Heart Condition by Incarceration Status, Nativity, and Citizenship (n=55926)
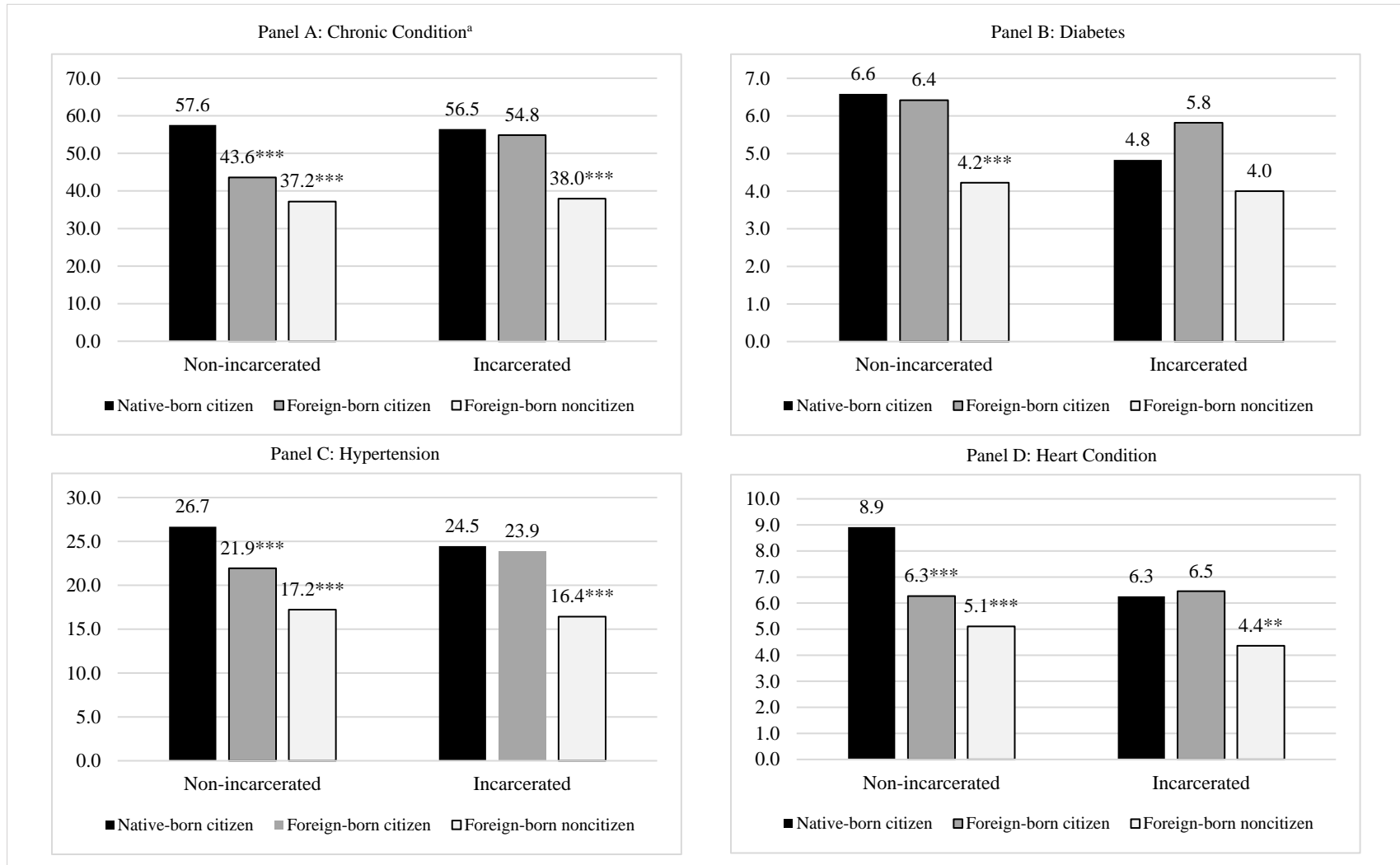


Panel A: Chronic Condition[a]

Panel B: Diabetes

Panel C: Hypertension

Panel D: Heart Condition

Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.
Notes: Weighted statistics. Models control for gender, age, and education. Full models with weighted coefficients can be found in Appendix Table A11. *Indicates significant difference from native-born citizen, same incarceration status sample at the 0.05 level, **0.01 level, and ***0.001 level, tests are two-tailed.
[a] 1=presence of any condition of the following conditions: diabetes mellitus, hypertension, heart condition, arthritis, asthma, cancer, and stroke.

Table 4. Summary of Results: Nativity Differences in Health by Incarceration status, Race/ethnicity and Citizenship among 2016 National Health Interview Survey (NHIS) Sample, 2016 Survey Prison Inmates (SPI) Sample, and Combined 2016 NHIS and 2016 SPI Samples

| | Non-incarcerated sample (n=31801) | Incarcerated sample (n=24125) | Combined incarceration status sample (n=55926) |
|---|---|---|---|
| Number of chronic conditions[a] | *** | *** | *** |
| Diabetes | - | - | - |
| Hypertension | *** | *** | *** |
| Heart condition | *** | - | *** |

| | Non-incarcerated sample (n=31801) | | | | Incarcerated sample (n=24125) | | | | Combined incarceration status sample (n=55926) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | White | Black | Other race | Latinx | White | Black | Other race | Latinx | White | Black | Other race | Latinx |
| Number of chronic conditions[a] | *** | *** | *** | *** | - | ** | *** | *** | *** | *** | *** | *** |
| Diabetes | - | - | - | - | - | - | - | - | - | - | - | - |
| Hypertension | ** | *** | - | ** | - | - | ** | *** | ** | *** | - | ** |
| Heart condition | - | * | *** | - | - | - | * | * | - | * | *** | - |

| | Non-incarcerated sample (n=31801) | | Incarcerated sample (n=24125) | | Combined incarceration status sample (n=55926) | |
|---|---|---|---|---|---|---|
| | Foreign-born citizen | Foreign-born noncitizen | Foreign-born citizen | Foreign-born noncitizen | Foreign-born citizen | Foreign-born non-citizen |
| Number of chronic conditions[a] | *** | *** | - | *** | *** | *** |
| Diabetes | - | ** | - | - | - | ** |
| Hypertension | *** | *** | - | *** | *** | *** |
| Heart condition | ** | *** | - | * | ** | *** |

Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.

Notes: Weighted statistics. All models control for gender, age, and education. Combined incarceration status model also controls for incarceration status. Full models including incidence rate ratios/odds ratios for these controls can be found in the Appendix (Appendix Tables A1-A3, A4-A6, & A8-A10). Respondents in the white, black, and other race categories identify as non-Latine **All significant results are reported with *, **, or *** and indicate lower risk or odds of a given health outcome for foreign-born individuals relative to native-born individuals.** *p < .05; **p <.01; ***p <.001, tests are two-tailed.

[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table 5. Weighted Descriptive Statistics for NIS Sample (n=3847)

|  | Wave 1 | Wave 2 |
|---|---|---|
| Presence of chronic condition[a] (%) | 16.91 | 26.06 |
| **Legal Status** | | |
| Initial authorization classification (%) | | |
| Permanently documented | 34.54 | 34.54 |
| Temporarily documented | 40.05 | 40.05 |
| Undocumented | 24.96 | 24.96 |
| LPR admission category (%) | | |
| Family Preference | 56.30 | 56.30 |
| Employment | 9.37 | 9.37 |
| Refugee | 6.38 | 6.38 |
| Legalization | 9.50 | 9.50 |
| Diversity or other | 18.45 | 18.45 |
| Citizen (%) | - | 7.70 |
| **Migration Characteristics** | | |
| Region of origin (%) | | |
| Latin America | 47.25 | 47.25 |
| Asia | 27.45 | 27.45 |
| Africa or Middle East | 9.93 | 9.93 |
| Europe or North America | 15.36 | 15.36 |
| Duration of residence (mean, SD) | 5.56(6.36) | 9.79(6.44) |
| **Demographic Characteristics** | | |
| Gender (1=woman, %) | 57.38 | 57.38 |
| Age (mean, SD) | 38.86(12.83) | 43.09(12.79) |
| Race/ethnicity (%) | | |
| Latinx | 42.41 | 42.41 |
| White | 19.08 | 19.08 |
| Asian | 26.60 | 26.60 |
| Black | 10.55 | 10.55 |
| Other race | 1.36 | 1.36 |
| Education (%) | | |
| Less than high school | 35.52 | 35.52 |
| High school | 16.30 | 16.30 |
| Some college | 19.66 | 19.66 |
| College degree or higher | 28.52 | 28.52 |
| Degree received between waves (%) | - | 14.13 |
| Married (%) | 77.81 | 80.16 |
| Employed (%) | 56.80 | 66.11 |

Source: Author's calculations using data from the New Immigrant Survey.
[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Table 6. Initial Authorization Classification and Odds of Reporting a Chronic Condition[a]

| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| **Legal Status** | | | | | | | | |
| Initial authorization classification (ref=permanently documented) | | | | | | | | |
|   Temporarily documented | 1.24* | [1.00-1.54] | 1.50** | [1.18-1.91] | 1.58*** | [1.24-2.02] | 1.47** | [1.12-1.93] |
|   Undocumented | 1.16 | [0.90-1.48] | 1.63** | [1.21-2.21] | 1.75*** | [1.29-2.38] | 1.51* | [1.02-2.23] |
| **Demographic Characteristics** | | | | | | | | |
| Gender | | | 1.16 | [0.94-1.42] | 1.06 | [0.86-1.32] | 1.06 | [0.86-1.31] |
| Age | | | 1.07*** | [1.06-1.08] | 1.07*** | [1.06-1.08] | 1.07*** | [1.06-1.07] |
| Race/ethnicity (ref=Latinx) | | | | | | | | |
|   White | | | 1.18 | [0.87-1.61] | 1.18 | [0.86-1.61] | 1.30 | [0.75-2.24] |
|   Asian | | | 0.90 | [0.68-1.19] | 0.89 | [0.67-1.19] | 0.82 | [0.37-1.86] |
|   Black | | | 1.31 | [0.90-1.90] | 1.27 | [0.87-1.85] | 1.51 | [0.92-2.46] |
|   Other race | | | 0.72 | [0.27-1.94] | 0.69 | [0.26-1.82] | | |
| Education (ref=<H.S.) | | | | | | | | |
|   High school | | | 0.98 | [0.71-1.35] | 0.98 | [0.71-1.35] | 1.00 | [0.72-1.38] |
|   Some college | | | 1.09 | [0.80-1.48] | 1.11 | [0.82-1.51] | 1.12 | [0.82-1.52] |
|   College degree or higher | | | 0.89 | [0.67-1.19] | 0.93 | [0.70-1.24] | 0.95 | [0.71-1.27] |
| Married | | | | | 0.88 | [0.69-1.13] | 0.89 | [0.70-1.14] |
| Employed | | | | | 0.77* | [0.62-0.97] | 0.76* | [0.60-0.96] |
| **Migration Characteristics** | | | | | | | | |
| Region of origin (ref=Latin America) | | | | | | | | |
|   Asia | | | | | | | 1.11 | [0.50-2.44] |
|   Africa or Middle East | | | | | | | 0.72 | [0.43-1.21] |
|   Europe or North America | | | | | | | 0.95 | [0.53-1.69] |
| Duration of residence | | | | | | | 1.01 | [0.99-1.04] |

Source: Author's calculations using data from the New Immigrant Survey.
Notes: Weighted Statistics. *p < .05; **p <.01; ***p <.001
[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Figure 6. Initial Authorization Classification and Predicted Probabilities of Reporting a Chronic Condition[a] at Baseline (n=3847)



Source: Author's calculations using data from the New Immigrant Survey.
Notes: Weighted statistics. Reference groups are permanently documented, Latin America, Latinx, and less than high school education. Error bars present 95% confidence intervals.
[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung condition.

Table 7. LPR Admission Category and Odds of Reporting a Chronic Condition[a] at Baseline (n=3847)

| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| **Legal Status** | | | | | | | | |
| LPR admission category (ref=family) | | | | | | | | |
|   Employment | 0.84 | [0.64-1.11] | 1.36 | [0.99-1.88] | 1.46* | [1.05-2.05] | 1.43* | [1.02-2.01] |
|   Refugee | 1.98*** | [1.45-2.72] | 2.98*** | [1.37-2.88] | 2.15*** | [1.46-3.16] | 2.17*** | [1.47-3.21] |
|   Legalization | 1.51** | [1.14-2.01] | 2.05*** | [1.47-2.86] | 2.20*** | [1.56-3.09] | 2.06*** | [1.41-3.01] |
|   Diversity or other | 0.55*** | [0.42-0.72] | 0.85 | [0.62-1.15] | 0.83 | [0.60-1.14] | 0.85 | [0.61-1.19] |
| **Demographic Characteristics** | | | | | | | | |
| Gender | | | 1.22 | [0.99-1.50] | 1.11 | [0.89-1.38] | 1.11 | [0.89-1.37] |
| Age | | | 1.07*** | [1.06-1.08] | 1.07*** | [1.06-1.07] | 1.07*** | [1.06-1.07] |
| Race/ethnicity (ref=Latinx) | | | | | | | | |
|   White | | | 1.17 | [0.85-1.61] | 1.15 | [0.83-1.59] | 1.37 | [0.78-2.40] |
|   Asian | | | 0.86 | [0.65-1.13] | 0.83 | [0.62-1.10] | 0.81 | [0.35-1.84] |
|   Black | | | 1.29 | [0.87-1.90] | 1.22 | [0.82-1.81] | 1.54 | [0.92-2.58] |
|   Other race | | | 0.72 | [0.27-1.97] | 0.67 | [0.25-1.80] | 0.69 | [0.25-1.93] |
| Education (ref=< H.S.) | | | | | | | | |
|   High school | | | 1.00 | [0.73-1.38] | 1.01 | [0.73-1.39] | 1.02 | [0.74-1.41] |
|   Some college | | | 1.13 | [0.84-1.53] | 1.17 | [0.86-1.58] | 1.17 | [0.86-1.59] |
|   College degree or higher | | | 0.95 | [0.71-1.26] | 0.99 | [0.74-1.33] | 1.02 | [0.76-1.36] |
| Married | | | | | 0.90 | [0.70-1.16] | 0.91 | [0.71-1.18] |
| Employed | | | | | 0.72** | [0.57-0.92] | 0.71** | [0.55-0.90] |
| **Migration Characteristics** | | | | | | | | |
| Region of origin (ref=Latin America) | | | | | | | | |
|   Asia | | | | | | | 1.06 | [0.47-2.38] |
|   Africa or Middle East | | | | | | | 0.65 | [0.38-1.12] |
|   Europe or North America | | | | | | | 0.87 | [0.47-1.58] |
| Duration of residence | | | | | | | 1.01 | [0.99-1.03] |

Source: Author's calculations using data from the New Immigrant Survey.

Notes: Weighted Statistics. *p < .05; **p <.01; ***p <.001

[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Figure 7. LPR Admission Category and Predicted Probabilities of Reporting a Chronic Condition[a] at Baseline (n=3847)



Source: Author's calculations using data from the New Immigrant Survey.
Notes: Weighted statistics. Reference groups are family preference, Latin America, Latinx, and less than high school education. Error bars present 95% confidence intervals.
[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Table 8. Initial Authorization Classification and Odds of Reporting a Chronic Condition[a] Over Time (n=3847)

|  | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
|  | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| **Legal Status** | | | | | | | | |
| Initial authorization classification (ref=permanently documented) | | | | | | | | |
| Temporarily documented | 1.03 | [0.75-1.43] | 1.58* | [1.11-2.25] | 1.51* | [1.05-2.16] | 1.05 | [0.71-1.54] |
| Undocumented | 0.96 | [0.66-1.39] | 2.12** | [1.35-3.33] | 2.02** | [1.27-3.20] | 0.93 | [0.54-1.60] |
| **Demographic Characteristics** | | | | | | | | |
| Gender | | | 1.39* | [1.04-1.87] | 1.56** | [1.14-2.13] | 1.60** | [1.16-2.19] |
| Age | | | 1.17*** | [1.15-1.19] | 1.18*** | [1.16-1.20] | 1.17*** | [1.15-1.19] |
| Race/ethnicity (ref=Latinx) | | | | | | | | |
| White | | | 1.35 | [0.86-2.13] | 1.35 | [0.85-2.14] | 2.56* | [1.02-6.44] |
| Asian | | | 0.93 | [0.61-1.40] | 0.89 | [0.58-1.36] | 1.20 | [0.39-3.70] |
| Black | | | 2.14** | [1.25-3.66] | 2.30** | [1.32-3.98] | 3.29** | [1.64-6.61] |
| Other race | | | 1.11 | ]0.32-3.91] | 1.10 | [0.31-4.00] | 1.48 | [0.33-6.59] |
| Education (ref=< H.S.) | | | | | | | | |
| High school | | | 0.92 | [0.59-1.44] | 0.92 | [0.58-1.45] | 0.94 | [0.59-1.49] |
| Some college | | | 1.32 | [0.86-2.03] | 1.27 | [0.82-1.97] | 1.27 | [0.81-1.99] |
| College degree or higher | | | 0.86 | [0.57-1.30] | 0.81 | [0.53-1.23] | 0.84 | [0.54-1.28] |
| Degree received between waves | | | 1.23 | [0.80-1.89] | 1.19 | [0.77-1.86] | 1.17 | [0.75-1.84] |
| Married | | | | | 1.61** | [1.13-2.29] | 1.66** | [1.16-2.37] |
| Employed | | | | | 1.34* | [1.04-1.73] | 1.22 | [0.94-1.57] |
| **Migration Characteristics** | | | | | | | | |
| Region of origin (ref=Latin America) | | | | | | | | |
| Asia | | | | | | | 0.81 | [0.27-2.44] |
| Africa or Middle East | | | | | | | 0.56 | [0.26-1.22] |
| Europe or North America | | | | | | | 0.57 | [0.22-1.48] |
| Duration of residence | | | | | | | 1.07*** | [1.04-1.10] |

Source: Author's calculations using data from the New Immigrant Survey.

Notes: Weighted Statistics. *p < .05; **p <.01; ***p <.001

[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Figure 8. Initial Authorization Classification and Predicted Probabilities of Reporting a Chronic Condition[a] Over Time (n=3847)



Source: Author's calculations using data from the New Immigrant Survey.
Notes: Weighted statistics. Reference groups are permanently documented, Latin America, Latinx, and less than high school education. Error bars present 95% confidence intervals.
[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Table 9. LPR Admission Category and Odds of Reporting a Chronic Condition[a] Over Time (n=3847)
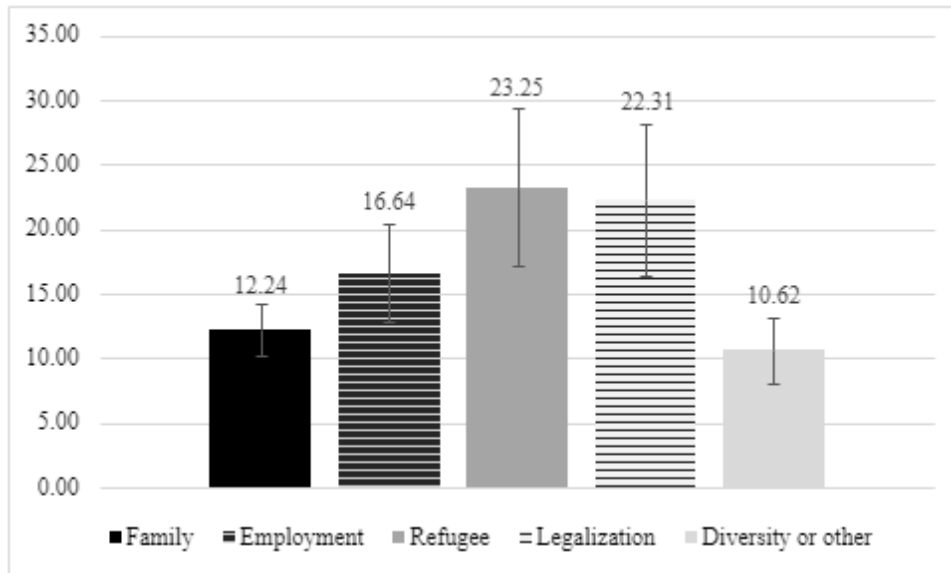
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| **Legal Status** | | | | | | | | |
| LPR admission category (ref=family) | | | | | | | | |
| Employment | 0.49** | [0.30-0.82] | 1.27 | [0.73-2.20] | 1.27 | [0.72-2.24] | 1.09 | [0.62-1.95] |
| Refugee | 3.73*** | [2.13-6.54] | 3.56*** | [2.01-6.28] | 3.68*** | [2.05-6.61] | 3.61*** | [1.99-6.57] |
| Legalization | 2.12** | [1.31-3.41] | 4.01*** | [2.39-6.74] | 4.13*** | [2.42-7.05] | 2.62** | [1.48-4.63] |
| Diversity or other | 0.48*** | [0.33-0.70] | 1.24 | [0.82-1.86] | 1.38 | [0.90-2.11] | 1.57* | [1.02-2.43] |
| **Demographic Characteristics** | | | | | | | | |
| Gender | | | 1.52** | [1.13-2.05] | 1.71** | [1.25-2.34] | 1.74** | [1.27-2.40] |
| Age | | | 1.17*** | [1.15-1.19] | 1.18*** | [1.16-1.20] | 1.17*** | [1.15-1.19] |
| Race/ethnicity (ref=Latinx) | | | | | | | | |
| White | | | 1.25 | [0.81-1.94] | 1.24 | [0.79-1.95] | 2.84* | [1.13-7.13] |
| Asian | | | 0.91 | [0.61-1.34] | 0.88 | [0.59-1.31] | 1.33 | [0.43-4.07] |
| Black | | | 1.93* | [1.15-3.27] | 2.09** | [1.22-3.58] | 3.48** | [1.75-6.94] |
| Other race | | | 1.18 | [0.34-4.08] | 1.18 | [0.33-4.20] | 1.69 | [0.38-7.44] |
| Education (ref=< H.S.) | | | | | | | | |
| High school | | | 0.93 | [0.60-1.46] | 0.92 | [0.59-1.46] | 0.93 | [0.58-1.47] |
| Some college | | | 1.38 | [0.90-2.11] | 1.32 | [0.85-2.04] | 1.31 | [0.84-2.05] |
| College degree or higher | | | 0.95 | [0.63-1.43] | 0.89 | [0.58-1.34] | 0.92 | [0.60-1.41] |
| Degree received between waves | | | 1.20 | [0.78-1.85] | 1.17 | [0.75-1.82] | 1.18 | [0.75-1.84] |
| Married | | | | | 1.77** | [1.24-2.53] | 1.80** | [1.26-2.59] |
| Employed | | | | | 1.28 | [0.99-1.65] | 1.17 | [0.91-1.52] |
| **Migration Characteristics** | | | | | | | | |
| Region of origin (ref=Latin America) | | | | | | | | |
| Asia | | | | | | | 0.85 | [0.28-2.54] |
| Africa or Middle East | | | | | | | 0.50 | [0.23-1.08] |
| Europe or North America | | | | | | | 0.48 | [0.18-1.26] |
| Duration of residence | | | | | | | 1.06*** | [1.03-1.08] |

Source: Author's calculations using data from the New Immigrant Survey.

Notes: Weighted Statistics. *p < .05; **p <.01; ***p <.001

[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Figure 9. LPR Admission Category and Predicted Probabilities of Reporting a Chronic Condition[a] Over Time (n=3847)



Source: Author's calculations using data from the New Immigrant Survey.
Notes: Weighted statistics. Reference groups are family preference, Latin America, Latinx, and less than high school education. Error bars present 95% confidence intervals.
[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Table 10. Citizenship and Odds of Reporting a Chronic Condition[a] Over Time (n=3847)

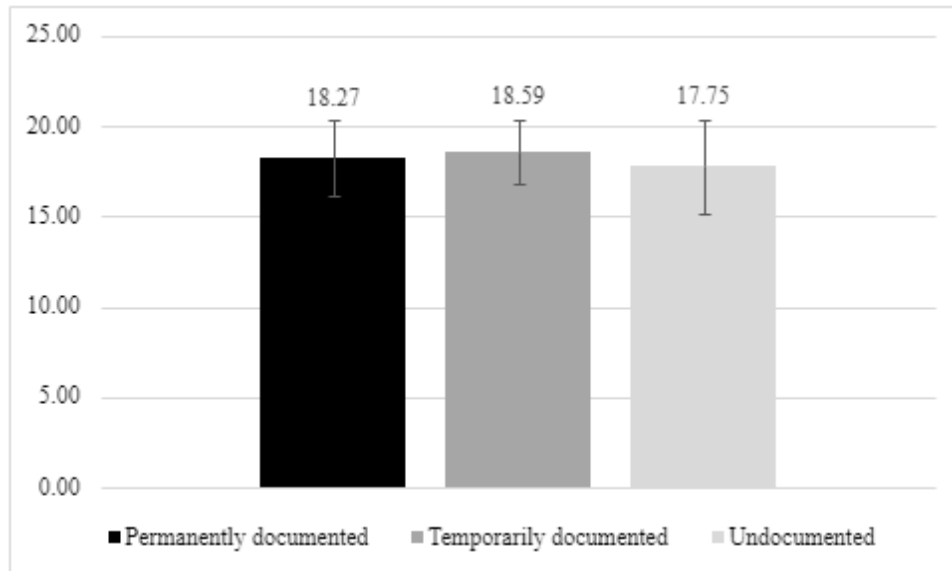| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| **Legal Status** | | | | | | | | |
| Citizen | 0.17*** | [0.09-0.32] | 0.58 | [0.31-1.07] | 0.52* | [0.27-0.97] | 0.49* | [0.26-0.93] |
| **Demographic Characteristics** | | | | | | | | |
| Gender | | | 1.36* | [1.02-1.82] | 1.55** | [1.14-2.11] | 1.64** | [1.20-2.25] |
| Age | | | 1.16*** | [1.15-1.18] | 1.17*** | [1.15-1.19] | 1.17*** | [1.15-1.19] |
| Race/ethnicity (ref=Latinx) | | | | | | | | |
| White | | | 1.12 | [0.74-1.71] | 1.14 | [0.74-1.74] | 2.59* | [1.04-6.47] |
| Asian | | | 0.68* | [0.47-0.99] | 0.67* | [0.46-0.98] | 1.20 | [0.39-3.67] |
| Black | | | 1.61 | [0.97-2.66] | 1.77* | [1.05-2.98] | 3.29** | [1.66-6.53] |
| Other race | | | 0.91 | [0.26-3.16] | 0.92 | [0.26-3.31] | 1.53 | [0.35-6.76] |
| Education (ref=< H.S.) | | | | | | | | |
| High school | | | 0.92 | [0.59-1.43] | 0.91 | [0.58-1.44] | 0.95 | [0.60-1.51] |
| Some college | | | 1.33 | [0.87-2.04] | 1.27 | [0.82-1.96] | 1.30 | [0.84-2.03] |
| College degree or higher | | | 0.89 | [0.60-1.32] | 0.83 | [0.55-1.24] | 0.88 | [0.58-1.33] |
| Degree received between waves | | | 1.20 | [0.78-1.86] | 1.18 | [0.76-1.84] | 1.22 | [0.78-1.91] |
| Married | | | | | 1.70** | [1.20-2.42] | 1.71** | [1.20-2.45] |
| Employed | | | | | 1.40** | [1.09-1.80] | 1.22 | [0.94-1.58] |
| **Migration Characteristics** | | | | | | | | |
| Region of origin (ref=Latin America) | | | | | | | | |
| Asia | | | | | | | 0.84 | [0.28-2.52] |
| Africa or Middle East | | | | | | | 0.57 | [0.26-1.24] |
| Europe or North America | | | | | | | 0.59 | [0.23-1.54] |
| Duration of residence | | | | | | | 1.07*** | [1.05-1.09] |

Source: Author's calculations using data from the New Immigrant Survey.

Notes: Weighted Statistics. *p < .05; **p <.01; ***p <.001

[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Figure 10. Citizenship and Predicted Probabilities of Reporting a Chronic Condition[a] Over Time (n=3847)
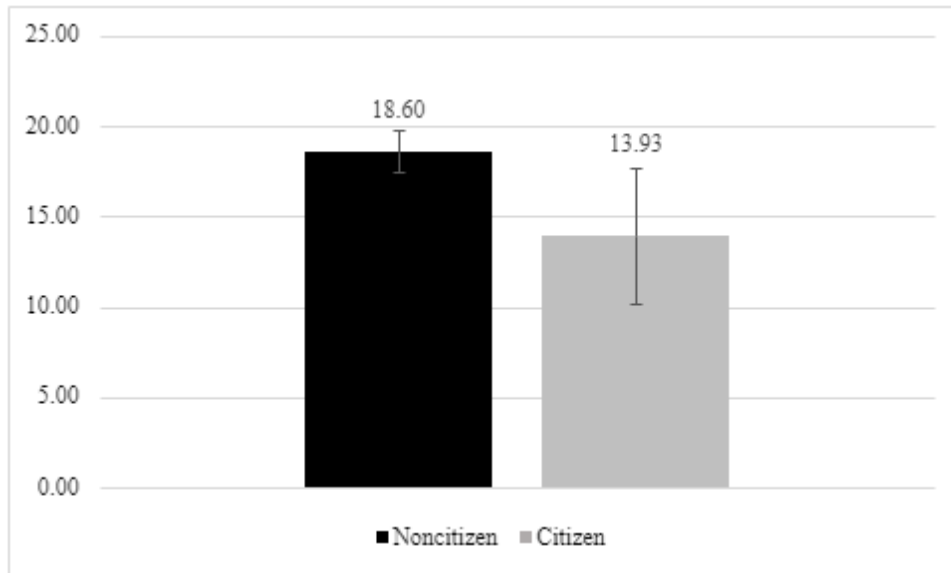


Source: Author's calculations using data from the New Immigrant Survey.
Notes: Weighted statistics. Reference groups are Latin America, Latinx, and less than high school education. Error bars present 95% confidence intervals.
[a] 1=presence of condition; includes diabetes mellitus, hypertension, arthritis, asthma, cancer, stroke, heart disease, and lung conditions.

Table 11. Weighted Descriptive Statistics for NIS Sample

| | Wave 1 | | Wave 2 | |
|---|---|---|---|---|
| | Total Sample (n=3545) | Women (n=1904) | Total Sample (n=3545) | Women (n=1904) |
| Mental illness (%) | 1.92 | 2.46 | 3.69 | 4.79 |
| LPR admission category (%) | | | | |
|   Family preference | 55.29 | 62.16 | 55.29 | 62.16 |
|   Employment and other | 38.15 | 32.09 | 38.15 | 32.09 |
|   Refugee | 6.55 | 5.76 | 6.55 | 5.76 |
| **Demographic Characteristics** | | | | |
| Gender (1=woman, %) | 58.87 | - | 58.87 | - |
| Age (mean, SD) | 38.49 (12.67) | 38.57 (13.57) | 42.73 (12.62) | 42.80 (13.03) |
| Race/ethnicity (%) | | | | |
|   Latinx | 41.44 | 42.90 | 41.44 | 42.90 |
|   Non-Latinx white | 20.03 | 18.79 | 20.03 | 18.79 |
|   Non-Latinx other race | 38.54 | 38.31 | 38.54 | 38.31 |
| Education (%) | | | | |
|   Less than high school | 34.55 | 35.82 | 34.55 | 35.82 |
|   High school or some college | 36.36 | 37.10 | 36.36 | 37.10 |
|   College degree or higher | 29.09 | 27.08 | 29.09 | 27.08 |
| Degree received between waves (%) | - | - | 14.94 | 16.92 |
| Employment status (%) | 56.40 | 44.75 | 70.97 | 61.62 |
| Marital status (%) | 77.59 | 76.75 | 82.99 | 81.23 |
| **Migration Characteristics** | | | | |
| Region of origin (%) | | | | |
|   Latin America | 46.25 | 47.62 | 46.25 | 47.62 |
|   Asia | 27.28 | 28.71 | 27.28 | 28.71 |
|   Other | 26.47 | 23.67 | 26.47 | 23.67 |
| Duration of residence (mean, SD) | 5.61 (6.44) | 5.11 (6.11) | 9.85 (6.52) | 9.34 (6.17) |
| Pre-migration trauma | 7.93 | 6.35 | 7.93 | 6.35 |

Source: Author's calculations using data from the New Immigrant Survey.

Table 12. Visa Category and Odds of Mental Illness at Baseline

| | Model 1: Total Sample (n=3545) | | Model 2: Women (n=1904) | |
|---|---|---|---|---|
| | Odds ratio | [CI] | Odds ratio | [CI] |
| LPR admission category (ref=family preference) | | | | |
|   Employment and other | 0.92 | [0.47-1.79] | 0.91 | [0.40-2.04] |
|   Refugee | 3.12** | [1.44-6.77] | 4.32** | [1.89-9.90] |
| **Demographic Characteristics** | | | | |
| Gender | 1.99* | [1.03-3.85] | - | - |
| Age | 1.01 | [0.99-1.03] | 1.01 | [0.98-1.03] |
| Race/ethnicity (ref=Latinx) | | | | |
|   Non-Latinx white | 0.33* | [0.13-0.86] | 0.50 | [0.16-1.58] |
|   Non-Latinx other race | 0.13*** | [0.05-0.31] | 0.12** | [0.04-0.40] |
| Education (ref=<H.S.) | | | | |
|   High school or some college | 0.46* | [0.23-0.92] | 0.43* | [0.19-0.99] |
|   College degree or higher | 0.60 | [0.30-1.17] | 0.68 | [0.30-1.52] |
| Employment status | 0.76 | [0.43-1.35] | 0.76 | [0.38-1.51] |
| Marital status | 0.61 | [0.34-1.08] | 0.62 | [0.32-1.21] |
| **Migration Characteristics** | | | | |
| Region of origin (ref=Latin America) | | | | |
|   Asia | 1.67 | [0.56-4.96] | 2.19 | [0.58-8.23] |
|   Other | 2.49 | [0.98-6.33] | 1.96 | [0.63-6.10] |
| Duration of residence | 1.01 | [0.96-1.05] | 0.98 | [0.92-1.05] |
| Pre-migration trauma | 1.75 | [0.91-3.38] | 1.73 | [0.84-3.55] |

Source: Author's calculations using data from the New Immigrant Survey.
Notes: Weighted Statistics. *p < .05; **p <.01; ***p <.001

Table 13. Visa Category and Odds of Mental Illness Over Time

| | Model 1: Total Sample (n=3545) | | Model 2: Women (n=1904) | |
|---|---|---|---|---|
| | Odds ratio | [CI] | Odds ratio | [CI] |
| LPR admission category (ref=family preference) | | | | |
|   Employment and other | 0.67 | [0.32-1.41] | 0.68 | [0.32-1.46] |
|   Refugee | 3.34 | [0.93-12.06] | 4.14* | [1.29-13.29] |
| **Demographic Characteristics** | | | | |
| Gender | 4.34*** | [2.09-9.01] | - | - |
| Age | 1.04** | [1.01-1.07] | 1.03* | [1.00-1.05] |
| Race/ethnicity (ref=Latinx) | | | | |
|   Non-Latinx white | 0.17 | [0.02-1.40] | 0.27 | [0.04-2.04] |
|   Non-Latinx other race | 0.03*** | [0.00-0.21] | 0.06** | [0.01-0.37] |
| Education (ref=<H.S.) | | | | |
|   High school or some college | 0.75 | [0.34-1.65] | 0.62 | [0.28-1.37] |
|   College degree or higher | 1.03 | [0.43-2.47] | 1.12 | [0.49-2.60] |
| Degree received between waves | 1.59 | [0.64-3.93] | 1.58 | [0.69-3.61] |
| Employment status | 0.79 | [0.45-1.40] | 0.86 | [0.49-1.51] |
| Marital status | 0.68 | [0.32-1.46] | 0.76 | [0.36-1.59] |
| **Migration Characteristics** | | | | |
| Region of origin (ref=Latin America) | | | | |
|   Asia | 5.81 | [0.80-42.25] | 3.74 | [0.60-23.42] |
|   Other | 3.74 | [0.46-30.19] | 2.98 | [0.42-21.08] |
| Duration of residence | 1.04 | [0.99-1.09] | 1.01 | [0.96-1.06] |
| Pre-migration trauma | 2.93 | [0.92-9.28] | 2.69 | [0.88-8.27] |

Source: Author's calculations using data from the New Immigrant Survey.
Notes: Weighted Statistics. *p < .05; **p <.01; ***p <.001

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**Appendix**

Table A1. Nativity Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 National Health Interview Survey Sample (n=31801)

| | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|
| | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Foreign-born | 0.72*** | [0.67-0.76] | 0.85 | [0.71-1.01] | 0.70*** | [0.61-0.79] | 0.64*** | [0.53-0.78] |
| Race/ethnicity (ref=white) | | | | | | | | |
| Black | 1.09*** | [1.04-1.14] | 1.70*** | [1.47-1.97] | 1.71*** | [1.52-1.92] | 0.79** | [0.68-0.92] |
| Other race | 0.92* | [0.85-0.99] | 1.29* | [1.01-1.65] | 1.11 | [0.93-1.32] | 0.65** | [0.49-0.86] |
| Latine | 0.90** | [0.84-0.96] | 1.48*** | [1.23-1.79] | 0.97 | [0.84-1.11] | 0.66*** | [0.54-0.82] |
| Gender (1=woman) | 1.04** | [1.01-1.07] | 0.87** | [0.79-0.97] | 0.81*** | [0.76-0.87] | 0.81*** | [0.74-0.89] |
| Age (ref=18-34 years) | | | | | | | | |
| 35-49 years | 1.99*** | [1.86-2.13] | 3.73*** | [2,83-4.91] | 3.58*** | [3.13-4.08] | 2.16*** | [1.75-2.68] |
| 50+ years | 4.50*** | [4.25-4.77] | 13.00*** | [10.14-16.66] | 12.90*** | [11.46-14.51] | 7.27*** | [6.09-8.67] |
| Education (ref=<HS) | | | | | | | | |
| High school | 0.84*** | [0.81-0.88] | 0.71*** | [0.61-0.82] | 0.71*** | [0.63-0.81] | 0.70** | [0.60-0.81] |
| Some college | 0.86*** | [0.82-0.90] | 0.68*** | [0.58-0.79] | 0.68*** | [0.60-0.76] | 0.72*** | [0.62-0.83] |
| College degree or higher | 0.70*** | [0.66-0.73] | 0.42*** | [0.35-0.49] | 0.48*** | [0.43-0.54] | 0.53*** | [0.46-0.62] |
| Constant | 0.47*** | [0.44-0.51] | 0.02*** | [0.02-0.03] | 0.14*** | [0.12-1.16] | 0.06*** | [0.05-0.08] |
| Inflate model constant | -2.66*** | [-2.86--2.46] | | | | | | |

Source: Author's calculations using data from the 2016 National Health Interview Survey.
Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.
[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A2. Nativity Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 Survey of Prison Inmates Sample (n=24125)

| | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|
| | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Foreign-born | 0.73*** | [0.67-0.80] | 0.90 | [0.72-1.13] | 0.73*** | [0.64-0.85] | 0.78 | [0.60-1.01] |
| Race/ethnicity (ref=white) | | | | | | | | |
|   Black | 0.98 | [0.94-1.03] | 1.25** | [1.07-1.47] | 1.47*** | [1.34-1.62] | 0.67*** | [0.58-0.79] |
|   Other race | 1.16*** | [1.10-1.23] | 1.35** | [1.11-1.64] | 1.30*** | [1.15-1.46] | 1.06 | [0.88-1.28] |
|   Latine | 0.94* | [0.88-1.00] | 1.44** | [1.16-1.78] | 0.98 | [0.87-1.10] | 0.74** | [0.60-0.90] |
| Gender (1=woman) | 1.29*** | [1.24-1.35] | 1.36*** | [1.17-1.57] | 1.02 | [0.93-1.11] | 1.00 | [0.86-1.16] |
| Age (ref=18-34 years) | | | | | | | | |
|   35-49 years | 1.76*** | [1.68-1.86] | 4.16*** | [3.31-5.23] | 2.61*** | [2.39-2.86] | 1.70*** | [1.41-2.04] |
|   50+ years | 3.43*** | [3.26-3.61] | 11.91*** | [9.51-14.92] | 7.26*** | [6.56-8.03] | 6.18*** | [5.18-7.37] |
| Education (ref=<HS) | | | | | | | | |
|   High school | 0.97 | [0.93-1.02] | 0.90 | [0.77-1.04] | 1.01 | [0.92-1.11] | 1.03 | [0.88-1.21] |
|   Some college | 1.05* | [1.00-1.11] | 1.06 | [0.89-1.26] | 1.09 | [0.98-1.23] | 1.37*** | [1.15-1.64] |
|   College degree or higher | 1.08* | [1.00-1.17] | 1.22 | [0.96-1.56] | 1.10 | [0.93-1.30] | 1.29* | [1.01-1.66] |
| Constant | 0.51*** | [0.48-0.54] | 0.02*** | [0.01-0.02] | 0.14*** | [0.13-0.16] | 0.04*** | [0.03-0.05] |
| Inflate model constant | -2.06*** | [-2.23--1.89] | | | | | | |

Source: Author's calculations using data from the 2016 Survey of Prison Inmates.

Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.

[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A3. Nativity Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 National Health Interview Survey and 2016 Survey of Prison Inmates Samples, Combined (n=55926)

| | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|
| | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Incarcerated | 0.97 | [0.94-1.01] | 0.74*** | [0.66-0.84] | 0.91* | [0.83-0.99] | 0.70*** | [0.62-0.79] |
| Foreign-born | 0.72*** | [0.67-0.76] | 0.85 | [0.71-1.01] | 0.70*** | [0.61-0.79] | 0.64*** | [0.53-0.78] |
| Race/ethnicity (ref=white) | | | | | | | | |
| Black | 1.08*** | [1.04-1.13] | 1.70*** | [1.47-1.96] | 1.70*** | [1.52-1.91] | 0.79** | [0.68-0.91] |
| Other race | 0.92* | [0.85-1.00] | 1.29* | [1.02-1.65] | 1.11 | [0.94-1.31] | 0.65** | [0.50-0.86] |
| Latine | 0.90** | [0.85-0.96] | 1.48*** | [1.23-1.79] | 0.97 | [0.84-1.11] | 0.67*** | [0.54-0.82] |
| Gender (1=woman) | 1.04** | [1.01-1.07] | 0.88** | [0.79-0.97] | 0.81*** | [0.76-0.87] | 0.81*** | [0.74-0.89] |
| Age (ref=18-34 years) | | | | | | | | |
| 35-49 years | 1.99*** | [1.86-2.13] | 3.73*** | [2.84-4.90] | 3.56*** | [3.13-4.06] | 2.16*** | [1.75-2.67] |
| 50+ years | 4.50*** | [4.25-4.76] | 13.00*** | [10.16-16.63] | 12.85*** | [11.43-14.43] | 7.27*** | [6.10-8.66] |
| Education (ref=<HS) | | | | | | | | |
| High school | 0.84*** | [0.81-0.88] | 0.71*** | [0.61-0.83] | 0.72*** | [0.64-0.80] | 0.70*** | [0.61-0.81] |
| Some college | 0.86*** | [0.82-0.90] | 0.68*** | [0.59-0.79] | 0.68*** | [0.60-0.76] | 0.72*** | [0.62-0.83] |
| College degree or higher | 0.70*** | [0.66-0.73] | 0.42*** | [0.36-0.49] | 0.48*** | [0.43-0.54] | 0.54*** | [0.46-0.62] |
| Constant | 0.47*** | [0.44-0.51] | 0.02*** | [0.02-0.03] | 0.14*** | [0.12-0.16] | 0.06*** | [0.05-0.08] |
| Inflate model constant | -2.65*** | [-2.85--2.46] | | | | | | |

Source: Author's calculations using data from the 2016 National Health Interview Survey and Survey of Prison Inmates.
Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.
[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A4. Nativity Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 National Health Interview Survey Sample, Models Stratified by Race/ethnicity

| | | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|---|
| | | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Model 1: White respondents (n=22593) | Foreign-born | 0.76*** | [0.69-0.84] | 0.85 | [0.62-1.15] | 0.76** | [0.62-0.92] | 0.83 | [0.65-1.07] |
| | Gender (1=woman) | 1.02 | [0.99-1.06] | 0.76*** | [0.67-0.85] | 0.79*** | [0.73-0.85] | 0.78*** | [0.70-0.86] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 1.95*** | [1.79-2.12] | 3.13*** | [2.18-4.49] | 3.62*** | [3.07-4.26] | 2.10*** | [1.64-2.68] |
| | 50+years | 4.31*** | [4.01-4.62] | 10.45*** | [7.58-14.39] | 12.78*** | [11.07-14.75] | 6.92*** | [5.64-8.50] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.85*** | [0.81-0.90] | 0.74** | [0.61-0.90] | 0.70*** | [0.61-0.81] | 0.71*** | [0.60-0.84] |
| | Some college | 0.85*** | [0.81-0.90] | 0.68*** | [0.56-0.82] | 0.63*** | [0.54-0.73] | 0.71*** | [0.60-0.84] |
| | College degree or higher | 0.69*** | [0.66-0.73] | 0.39*** | [0.32-0.48] | 0.43*** | [0.37-0.50] | 0.54*** | [0.45-0.64] |
| | Constant | 0.49*** | [0.45-0.53] | 0.03*** | [0.02-0.05] | 0.15*** | [0.12-0.18] | 0.06*** | [0.05-0.08] |
| | Inflate model constant | -2.80*** | [-3.05--2.55] | | | | | | |
| Model 2: Black respondents (n=3483) | Foreign-born | 0.58*** | [0.48-0.69] | 0.96 | [0.62-1.49] | 0.48*** | [0.32-0.72] | 0.47* | [0.24-0.94] |
| | Gender (1=woman) | 1.10* | [1.01-1.20] | 1.26 | [0.96-1.65] | 1.02 | [0.82-1.26] | 1.08 | [0.80-1.45] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 2.26*** | [1.91-2.68] | 4.64*** | [2.59-8.33] | 4.03*** | [2.92-5.57] | 2.96*** | [1.64-5.37] |
| | 50+years | 4.33*** | [3.77-4.97] | 16.15*** | [9.56-27.31] | 10.68*** | [7.93-14.39] | 8.62*** | [5.22-14.24] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.83*** | [0.74-0.92] | 0.78 | [0.55-1.09] | 0.60*** | [0.45-0.80] | 0.77 | [0.54-1.10] |
| | Some college | 0.87* | [0.78-0.97] | 0.83 | [0.59-1.16] | 0.63** | [0.47-0.84] | 0.68* | [0.47-0.97] |
| | College degree or higher | 0.74*** | [0.65-0.84] | 0.70 | [0.46-1.06] | 0.50*** | [0.36-0.68] | 0.45** | [0.28-0.73] |
| | Constant | 0.50*** | [0.42-0.58] | 0.02*** | [0.01-0.04] | 0.24*** | [0.17-0.34] | 0.04*** | [0.02-0.06] |
| | Inflate model constant | -2.96*** | [-3.69--2.24] | | | | | | |
| Model 3: Other race respondents (n=2079) | Foreign-born | 0.65*** | [0.56-0.74] | 0.77 | [0.51-1.17] | 0.85 | [0.62-1.16] | 0.32*** | [0.18-0.54] |
| | Gender (1=woman) | 0.96 | [0.83-1.11] | 1.50 | [0.96-2.35] | 0.57** | [0.41-0.79] | 0.75 | [0.45-1.26] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 1.58** | [1.18-2.11] | 2.99 | [0.94-9.55] | 3.16*** | [1.81-5.54] | 2.81* | [1.02-7.74] |
| | 50+years | 4.82*** | [3.77-6.16] | 11.85*** | [4.19-33.55] | 18.91*** | [11.25-31.77] | 10.56*** | [4.49-24.81] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.86 | [0.68-1.07] | 0.68 | [0.32-1.44] | 0.75 | [0.41-1.36] | 0.44* | [0.21-0.94] |
| | Some college | 0.74** | [0.58-0.93] | 0.45* | [0.21-0.94] | 0.64 | [0.36-1.12] | 0.32** | [0.15-0.67] |
| | College degree or higher | 0.73** | [0.58-0.91] | 0.58 | [0.27-1.24] | 0.74 | [0.42-1.28] | 0.52 | [0.24-1.11] |
| | Constant | 0.49*** | [0.36-0.66] | 0.03*** | [0.01-0.07] | 0.11*** | [0.06-0.21] | 0.06*** | [0.02-0.16] |
| | Inflate model constant | -2.80*** | [-4.02--1.58] | | | | | | |
| Model 4: Latine respondents | Foreign-born | 0.76*** | [0.68-0.85] | 0.72 | [0.52-1.00] | 0.70** | [0.55-0.90] | 0.67 | [0.44-1.02] |
| | Gender (1=woman) | 1.15* | [1.03-1.29] | 0.92 | [0.69-1.23] | 0.90 | [0.72-1.12] | 0.93 | [0.65-1.32] |

| (n=3646) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (ref=18-34 years) | | | | | | | | | |
| 35-49 years | 2.04*** | [1.66-2.51] | 5.06*** | [2.61-9.79] | 3.34*** | [2.35-4.75] | 1.84 | [0.92-3.68] |
| 50+years | 5.51*** | [4.67-6.52] | 20.38*** | [11.15-37.27] | 14.61*** | [10.51-20.31] | 7.74*** | [4.33-13.82] |
| Education (ref=<HS) | | | | | | | | | |
| High school | 0.84* | [0.74-0.97] | 0.59* | [0.39-0.89] | 0.75* | [0.56-1.00] | 0.62* | [0.39-0.98] |
| Some college | 1.00 | [0.85-1.16] | 0.65* | [0.44-0.95] | 0.88 | [0.64-1.21] | 1.05 | [0.64-1.72] |
| College degree or higher | 0.65*** | [0.55-0.77] | 0.28*** | [0.18-0.44] | 0.50*** | [0.35-0.71] | 0.55* | [0.31-0.96] |
| Constant | 0.37*** | [0.31-0.45] | 0.03*** | [0.02-0.05] | 0.11*** | [0.07-0.16] | 0.03*** | [0.02-0.06] |
| Inflate model constant | -1.62*** | [-1.99--1.25] | | | | | | |

Source: Author's calculations using data from the 2016 National Health Interview Survey.

Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.

[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A5. Nativity Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 Survey of Prison Inmates Sample, Models Stratified by Race/ethnicity

| | | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|---|
| | | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Model 1: White respondents (n=8311) | Foreign-born | 1.14 | [0.91-1.44] | 1.80 | [0.91-3.57] | 1.17 | [0.71-1.93] | 1.45 | [0.76-2.75] |
| | Gender (1=woman) | 1.21*** | [1.14-1.28] | 1.06 | [0.83-1.34] | 0.81** | [0.71-0.93] | 0.96 | [0.77-1.19] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 1.79*** | [1.63-1.97] | 4.32*** | [2.69-6.94] | 2.46*** | [2.06-2.94] | 1.46* | [1.06-2.01] |
| | 50+years | 3.42*** | [3.11-3.76] | 10.90*** | [6.87-17.27] | 6.61*** | [5.51-7.94] | 5.91*** | [4.38-7.99] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.97 | [0.90-1.05] | 0.87 | [0.65-1.15] | 1.04 | [0.88-1.22] | 1.13 | [0.87-1.46] |
| | Some college | 1.06 | [0.97-1.15] | 0.90 | [0.67-1.22] | 1.16 | [0.96-1.39] | 1.32 | [1.00-1.74] |
| | College degree or higher | 1.05 | [0.95-1.17] | 1.10 | [0.77-1.57] | 1.01 | [0.79-1.29] | 1.30 | [0.93-1.82] |
| | Constant | 0.51*** | [0.47-0.56] | 0.02*** | [0.01-0.03] | 0.15*** | [0.13-0.18] | 0.04*** | [0.03-0.05] |
| | Inflate model constant | -1.95*** | [-2.22--1.69] | | | | | | |
| Model 2: Black respondents (n=7357) | Foreign-born | 0.74** | [0.59-0.93] | 0.72 | [0.36-1.43] | 0.93 | [0.62-1.40] | 0.75 | [0.32-1.75] |
| | Gender (1=woman) | 1.45*** | [1.34-1.56] | 2.16*** | [1.65-2.84] | 1.45*** | [1.22-1.72] | 1.00 | [0.71-1.41] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 1.86*** | [0.72-2.02] | 4.73*** | [3.44-6.52] | 3.12*** | [2.70-3.59] | 1.82*** | [1.31-2.54] |
| | 50+years | 3.33*** | [3.08-3.61] | 13.10*** | [9.53-18.01] | 7.99*** | [6.78-9.42] | 5.58*** | [4.05-7.68] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.95 | [0.88-1.03] | 1.02 | [0.79-1.32] | 1.03 | [0.88-1.19] | 0.74 | [0.54-1.02] |
| | Some college | 1.00 | [0.91-1.10] | 1.07 | [0.78-1.47] | 0.99 | [0.81-1.22] | 1.21 | [0.83-1.76] |
| | College degree or higher | 1.19 | [0.99-1.41] | 1.83* | [1.07-3.12] | 1.34 | [0.93-1.94] | 1.26 | [0.65-2.44] |
| | Constant | 0.47*** | [0.43-0.50] | 0.02*** | [0.01-0.02] | 0.19*** | [0.17-0.21] | 0.03*** | [0.2-0.04] |
| | Inflate model constant | -2.88*** | [-3.51--2.25] | | | | | | |
| Model 3: Other race respondents (n=3238) | Foreign-born | 0.52*** | [0.40-0.68] | 0.99 | [0.49-2.01] | 0.51** | [0.32-0.81] | 0.31* | [0.12-0.85] |
| | Gender (1=woman) | 1.30*** | [1.19-1.43] | 1.38 | [0.98-1.93] | 0.98 | [0.79-1.23] | 1.03 | [0.73-1.44] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 1.53*** | [1.35-1.74] | 3.44*** | [2.09-5.67] | 2.22*** | [1.75-2.81] | 1.34 | [0.87-2.08] |
| | 50+years | 3.11*** | [2.75-3.51] | 10.76*** | [6.71-17.26] | 6.18*** | [4.78-7.98] | 4.87*** | [3.28-7.25] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 1.00 | [0.89-1.12] | 0.69 | [0.46-1.04] | 0.99 | [0.78-1.26] | 1.37 | [0.94-2.01] |
| | Some college | 1.10 | [0.98-1.24] | 1.21 | [0.81-1.81] | 1.26 | [0.96-1.67] | 2.05*** | [1.39-3.04] |
| | College degree or higher | 1.03 | [0.85-1.25] | 0.87 | [0.44-1.71] | 1.09 | [0.66-1.81] | 1.28 | [0.60-2.74] |
| | Constant | 0.65*** | [0.57-0.73] | 0.03*** | [0.02-0.04] | 0.21*** | [0.17-0.25] | 0.04*** | [0.03-0.06] |
| | Inflate model constant | -2.12*** | [-2.54--1.69] | | | | | | |
| Model 4: Latine respondents | Foreign-born | 0.71*** | [0.64-0.78] | 0.82 | [0.63-1.06] | 0.69*** | [0.57-0.82] | 0.71* | [0.52-0.98] |
| | Gender (1=woman) | 1.36*** | [1.21-1.53] | 1.09 | [0.76-1.55] | 0.87 | [0.68-1.10] | 1.16 | [0.77-1.74] |

| (n=5219) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Age (ref=18-34 years) | | | | | | | | |
| 35-49 years | 1.77*** | [1.57-1.99] | 3.79*** | [2.23-6.44] | 2.28*** | [1.86-2.81] | 2.60*** | [1.71-3.93] |
| 50+years | 3.91*** | [3.47-4.40] | 12.81*** | [7.51-21.85] | 7.77*** | [6.12-9.87] | 9.91*** | [6.51-15.06] |
| Education (ref=<HS) | | | | | | | | |
| High school | 0.97 | [0.86-1.08] | 0.89 | [0.63-1.27] | 0.95 | [0.77-1.17] | 1.01 | [0.67-1.52] |
| Some college | 1.08 | [0.94-1.24] | 1.23 | [0.81-1.86] | 0.97 | [0.73-1.28] | 1.26 | [0.77-2.07] |
| College degree or higher | 1.09 | [0.89-1.33] | 1.10 | [0.64-1.89] | 1.16 | [0.77-1.76] | 1.39 | [0.74-2.60] |
| Constant | 0.50*** | [0.45-0.57] | 0.03*** | [0.01-0.04] | 0.15*** | [0.13-0.19] | 0.02*** | [0.01-0.03] |
| Inflate model constant | -1.39*** | [-1.67--1.11] | | | | | | |

Source: Author's calculations using data from the 2016 Survey of Prison Inmates.

Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.

[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A6. Nativity Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 National Health Interview Survey and 2016 Survey of Prison Inmates Samples, Models Stratified by Race/ethnicity

| | | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|---|
| | | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Model 1: White respondents (n=30904) | Incarceration status | 0.97 | [0.93-1.01] | 0.81* | [0.69-0.96] | 0.91 | [0.81-1.01] | 0.70*** | [0.61-0.81] |
| | Foreign-born | 0.76*** | [0.69-0.84] | 0.85 | [0.63-1.15] | 0.76** | [0.62-0.92] | 0.83 | [0.65-1.07] |
| | Gender (1=woman) | 1.02 | [0.99-1.06] | 0.76*** | [0.67-0.85] | 0.79*** | [0.73-0.85] | 0.78*** | [0.70-0.86] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 1.95*** | [1.79-2.12] | 3.13*** | [2.19-4.49] | 3.61*** | [3.07-4.25] | 2.09*** | [1.64-2.68] |
| | 50+years | 4.30*** | [4.01-4.62] | 10.45*** | [7.59-14.39] | 12.75*** | [11.06-14.71] | 6.92*** | [5.65-8.49] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.85*** | [0.81-0.90] | 0.74** | [0.61-0.90] | 0.70*** | [0.61-0.82] | 0.71*** | [0.60-0.85] |
| | Some college | 0.85*** | [0.81-0.90] | 0.68*** | [0.57-0.82] | 0.63*** | [0.55-0.73] | 0.72*** | [0.61-0.85] |
| | College degree or higher | 0.69*** | [0.66-0.73] | 0.39*** | [0.32-0.48] | 0.43*** | [0.38-0.50] | 0.54*** | [0.45-0.64] |
| | Constant | 0.49*** | [0.45-0.53] | 0.03*** | [0.02-0.05] | 0.15*** | [0.12-0.18] | 0.06*** | [0.05-0.08] |
| | Inflate model constant | -2.79*** | [-3.04--2.55] | | | | | | |
| Model 2: Black respondents (n=10840) | Incarceration status | 0.85*** | [0.78-0.93] | 0.82 | [0.62-1.09] | 0.78* | [0.63-0.97] | 0.58*** | [0.44-0.78] |
| | Foreign-born | 0.58*** | [0.48-0.69] | 0.96 | [0.62-1.48] | 0.48*** | [0.32-0.72] | 0.47* | [0.24-0.94] |
| | Gender (1=woman) | 1.10* | [1.01-1.20] | 1.26 | [0.96-1.65] | 1.02 | [0.82-1.26] | 1.08 | [0.80-1.45] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 2.25*** | [1.91-2.66] | 4.65*** | [2.62-8.25] | 4.01*** | [2.93-5.49] | 2.94*** | [1.64-5.26] |
| | 50+years | 4.31*** | [3.77-4.94] | 16.13*** | [9.62-27.02] | 10.64*** | [7.95-14.25] | 8.57*** | [5.24-14.02] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.83*** | [0.75-0.92] | 0.78 | [0.56-1.09] | 0.61*** | [0.46-0.81] | 0.77 | [0.54-1.10] |
| | Some college | 0.87* | [0.79-0.97] | 0.83 | [0.60-1.16] | 0.64** | [0.48-0.84] | 0.68* | [0.47-0.97] |
| | College degree or higher | 0.74*** | [0.65-0.85] | 0.70 | [0.46-1.06] | 0.50*** | [0.37-0.69] | 0.45** | [0.28-0.73] |
| | Constant | 0.50*** | [0.42-0.58] | 0.02*** | [0.01-0.04] | 0.24*** | [0.17-0.34] | 0.04*** | [0.02-0.06] |
| | Inflate model constant | -2.96*** | [-3.68--2.24] | | | | | | |
| Model 3: Other race respondents (n=5317) | Incarceration status | 1.16 | [0.99-1.36] | 1.17 | [0.72-1.91] | 1.44 | [0.97-2.14] | 0.69 | [0.40-1.19] |
| | Foreign-born | 0.65*** | [0.56-0.74] | 0.77 | [0.51-1.17] | 0.85 | [0.62-1.16] | 0.32*** | [0.19-0.54] |
| | Gender (1=woman) | 0.96 | [0.83-1.11] | 1.50 | [0.96-2.34] | 0.57** | [0.42-0.79] | 0.75 | [0.45-1.26] |
| | Age (ref=18-34 years) | | | | | | | | |
| | 35-49 years | 1.58** | [1.19-2.10] | 3.00 | [0.96-9.37] | 3.13*** | [1.82-5.37] | 2.75* | [1.03-7.34] |
| | 50+years | 4.79*** | [3.77-6.09] | 11.87*** | [4.28-32.95] | 18.56*** | [11.22-30.69] | 10.38*** | [4.56-23.67] |
| | Education (ref=<HS) | | | | | | | | |
| | High school | 0.86 | [0.69-1.07] | 0.69 | [0.33-1.43] | 0.76 | [0.43-1.35] | 0.46* | [0.22-0.96] |
| | Some college | 0.74** | [0.59-0.93] | 0.45* | [0.22-0.94] | 0.65 | [0.37-1.12] | 0.33** | [0.16-0.69] |
| | College degree or higher | 0.73** | [0.59-0.91] | 0.58 | [0.27-1.23] | 0.74 | [0.43-1.27] | 0.53 | [0.25-1.13] |
| | Constant | 0.49*** | [0.37-0.66] | 0.03*** | [0.01-0.07] | 0.11*** | [0.06-0.21] | 0.06*** | [0.02-0.15] |

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|  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | Inflate model constant | -2.78*** | [-3.94--1.62] |  |  |  |  |  |  |
| Model 4: | Incarceration status | 1.14* | [1.02-1.26] | 0.77 | [0.58-1.02] | 1.07 | [0.85-1.35] | 0.87 | [0.62-1.23] |
| Latine respondents | Foreign-born | 0.76*** | [0.68-0.85] | 0.72 | [0.52-1.00] | 0.70** | [0.55-0.89] | 0.67 | [0.45-1.01] |
| (n=8865) | Gender (1=woman) | 1.15* | [1.03-1.29] | 0.92 | [0.69-1.23] | 0.90 | [0.72-1.12] | 0.93 | [0.65-1.32] |
|  | Age (ref=18-34 years) |  |  |  |  |  |  |  |  |
|  | 35-49 years | 2.04*** | [1.67-2.50] | 5.04*** | [2.63-9.67] | 3.32*** | [2.35-4.70] | 1.85 | [0.93-3.67] |
|  | 50+years | 5.50*** | [4.66-6.49] | 20.31*** | [11.19-36.84] | 14.52*** | [10.49-20.11] | 7.76*** | [4.36-13.79] |
|  | Education (ref=<HS) |  |  |  |  |  |  |  |  |
|  | High school | 0.84* | [0.74-0.97] | 0.59* | [0.40-0.89] | 0.75* | [0.57-0.99] | 0.62* | [0.40-0.98] |
|  | Some college | 1.00 | [0.86-1.16] | 0.65* | [0.45-0.95] | 0.88 | [0.64-1.21] | 1.05 | [0.64-1.72] |
|  | College degree or higher | 0.65*** | [0.55-0.77] | 0.28*** | [0.18-0.44] | 0.50*** | [0.36-0.71] | 0.55* | [0.31-0.96] |
|  | Constant | 0.37*** | [0.31-0.45] | 0.03*** | [0.02-0.05] | 0.11*** | [0.07-0.16] | 0.03*** | [0.02-0.06] |
|  | Inflate model constant | -1.62*** | [-1.98--1.25] |  |  |  |  |  |  |

Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.

Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *$p < .05$; **$p < .01$; ***$p < .001$, tests are two-tailed.

[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A7. Effect of Incarceration Status, Nativity, and Race/ethnicity on Presence of Chronic Condition, Diabetes, Hypertension, and Heart Conditions with Three-Way Interaction Models: Weighted Coefficients from Logistic Regressions (n=55926)

| | Panel A: Presence of Chronic Condition[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|
| | Unstandardized Coefficient | [CI] | Unstandardized Coefficient | [CI] | Unstandardized Coefficient | [CI] | Unstandardized Coefficient | [CI] |
| Incarcerated | -0.04 | [-0.14-0.06] | -0.14 | [-0.30-0.01] | -0.05 | [-0.16-0.05] | -0.35*** | [-0.48--0.21] |
| Foreign-born | -0.68*** | [-0.86--0.50] | -018 | [-0.48-0.13] | -0.28** | [-0.48-0.09] | -0.18 | [-0.44-0.07] |
| Race/ethnicity (ref=white) | | | | | | | | |
| Black | 0.21** | [0.09-0.32] | 0.52*** | [0.37-0.67] | 0.58*** | [0.46-0.70] | -0.20* | [-0.36--0.05] |
| Other race | -0.11 | [-0.33-0.12] | 0.20 | [-0.08-0.47] | -0.09 | [-0.32-0.14] | -0.14 | [-0.47-0.19] |
| Latine | -0.26** | [-0.41--0.10] | 0.44*** | [0.21-0.67] | -0.01 | [-0.19-0.17] | -0.39** | [-0.65-0.12] |
| Gender (1=woman) | 0.08* | [0.01-0.15] | -0.13** | [-0.23--0.03] | -0.21*** | [-0.28--0.14] | -0.20*** | [-0.29--0.11] |
| Age (ref=18-34 years) | | | | | | | | |
| 35-49 years | 0.77*** | [0.68-0.86] | 1.32*** | [1.05-1.60] | 1.27*** | [1.14-1.40] | 0.77*** | [0.56-0.99] |
| 50+ years | 2.15*** | [2.06-2.23] | 2.57*** | [2.32-2.82] | 2.55*** | [2.44-2.67] | 1.99*** | [1.81-2.16] |
| Education (ref=<HS) | | | | | | | | |
| High school | -0.22*** | [-0.34--0.10] | -0.35*** | [-0.50--0.20] | -0.33*** | [-0.45--0.22] | -0.35*** | [-0.50--0.21] |
| Some college | -0.19** | [-0.31--0.06] | -0.39*** | [-0.54--0.24] | -0.39*** | [-0.50--0.27] | -0.33*** | [-0.48-0.19] |
| College degree or higher | -0.47*** | [-0.60--0.35] | -0.88*** | [-1.04-0.72] | -0.74*** | [-0.85--0.62] | -0.62*** | [-0.77--0.47] |
| Incarceration & Nativity | | | | | | | | |
| Incarcerated#foreign-born | 1.04*** | [0.60-1.51] | 0.85* | [0.07-1.63] | 0.55 | [-0.08-1.18] | 0.71 | [-0.02-1.43] |
| Incarceration & Race/ethnicity | | | | | | | | |
| Incarcerated#black | -0.14 | [-0.29-0.00] | -0.39*** | [-0.61--0.17] | -0.23** | [-0.39--0.08] | -0.31** | [-0.53--0.09] |
| Incarcerated#other race | 0.36** | [0.10-0.61] | 0.06 | [-0.28--0.40] | 0.36** | [0.09-0.62] | 0.17 | [-0.21-0.55] |
| Incarcerated#Latine | 0.13 | [-0.06-0.33] | -0.12 | [-0.43-0.20] | -0.01 | [-0.23-0.22] | -0.01 | [-0.35-0.33] |
| Nativity & Race/ethnicity | | | | | | | | |
| Foreign-born#black | -0.30 | [-0.69-0.09] | 0.14 | [-0.40-0.67] | -0.48* | [-0.94--0.02] | -0.58 | [-1.30-0.14] |
| Foreign-born#other race | 0.13 | [-0.21-0.47] | 0.10 | [-0.41-0.62] | 0.22 | [-0.14-0.57] | -0.79** | [-1.35-0.22] |
| Foreign-born#Latine | 0.10 | [-0.17-0.37] | -0.06 | [-0.49-0.36] | -0.11 | [-0.41-0.18] | -0.28 | [-0.71-0.16] |
| Incarceration, Race, & Nativity | | | | | | | | |
| Incarcerated#foreign-born#black | -0.50 | [-1.20-0.19] | -0.96 | [-2.12-0.20] | 0.26 | [-0.61-1.13] | -0.13 | [-1.43-1.17] |
| Incarcerated#foreign-born#other race | -1.49*** | [-2.16--0.81] | -0.69 | [-1.83-0.44] | -1.12** | [-1.96--0.28] | -0.82 | [-2.18-0.54] |
| Incarcerated#foreign-born#Latine | -1.08*** | [-1.61--0.55] | -0.84 | [-1.71-0.04] | -0.62 | [-1.31-0.08] | -0.57 | [-1.43-0.29] |
| Constant | -0.61*** | [-0.74--0.48] | -3.72*** | [-4.00--3.44] | -1.99*** | [-2.15--1.84] | -2.80*** | [-3.01--2.59] |

Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.
Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed. Results for all panels from logistic regressions.
[a] Presence of chronic condition is a binary variable measuring if respondents reported having any of the following conditions: diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A8. Intersecting Nativity and Citizenship Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 National Health Interview Survey Sample (n=31801)

| | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|
| | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Nativity & citizenship | | | | | | | | |
| Foreign-born citizen | 0.78*** | [0.73-0.83] | 0.97 | [0.80-1.18] | 0.77*** | [0.67-0.89] | 0.68** | [0.55-0.85] |
| Foreign-born noncitizen | 0.60*** | [0.54-0.67] | 0.63** | [0.47-0.84] | 0.57*** | [0.47-0.70] | 0.55*** | [0.40-0.75] |
| Race/ethnicity (ref=white) | | | | | | | | |
| Black | 1.08*** | [1.04-1.13] | 1.70*** | [1.47-1.96] | 1.70*** | [1.52-1.91] | 0.79** | [0.68-0.92] |
| Other race | 0.91* | [0.84-0.99] | 1.27 | [0.99-1.62] | 1.10 | [0.92-1.30] | 0.65** | [0.49-0.85] |
| Latine | 0.91** | [0.86-0.98] | 1.52*** | [1.26-1.83] | 0.98 | [0.86-1.13] | 0.67*** | [0.55-0.83] |
| Gender (1=woman) | 1.04** | [1.01-1.07] | 0.88** | [0.79-0.97] | 0.81*** | [0.76-0.87] | 0.82*** | [0.74-0.89] |
| Age (ref=18-34 years) | | | | | | | | |
| 35-49 years | 1.99*** | [1.86-2.13] | 3.74*** | [2.84-4.92] | 3.58*** | [3.13-4.09] | 2.17*** | [1.75-2.68] |
| 50+ years | 4.46*** | [4.21-4.72] | 12.69*** | [9.90-16.25] | 12.72*** | [11.31-14.31] | 7.22** | [6.05-8.62] |
| Education (ref=<high school) | | | | | | | | |
| High school | 0.84*** | [0.80-0.87] | 0.69*** | [0.59-0.80] | 0.70*** | [0.62-0.79] | 0.69*** | [0.60-0.80] |
| Some college | 0.85*** | [0.81-0.89] | 0.66*** | [0.57-0.76] | 0.66*** | [0.59-0.74] | 0.71*** | [0.61-0.82] |
| College degree or higher | 0.69*** | [0.66-0.72] | 0.40*** | [0.34-0.47] | 0.47*** | [0.42-0.53] | 0.53*** | [0.46-0.61] |
| Constant | 0.48*** | [0.45-0.52] | 0.03*** | [0.02-0.03] | 0.14*** | [0.12-0.16] | 0.06*** | [0.05-0.08] |
| Inflate model constant | -2.67*** | [-2.87--2.47] | | | | | | |

Source: Author's calculations using data from the 2016 National Health Interview Survey.
Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.
[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A9. Intersecting Nativity and Citizenship Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 Survey of Prison Inmates Sample (n=24125)

| | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|
| | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Nativity & citizenship | | | | | | | | |
| Foreign-born citizen | 0.92 | [0.82-1.04] | 1.09 | [0.78-1.52] | 0.92 | [0.73-1.16] | 0.93 | [0.63-1.35] |
| Foreign-born noncitizen | 0.63*** | [0.57-0.69] | 0.80 | [0.62-1.04] | 0.64*** | [0.54-0.76] | 0.69* | [0.51-0.93] |
| Race/ethnicity (ref=white) | | | | | | | | |
| Black | 0.98 | [0.94-1.03] | 1.25** | [1.07-1.47] | 1.47*** | [1.34-1.62] | 0.67*** | [0.58-0.79] |
| Other race | 1.16*** | [1.10-1.23] | 1.35** | [1.11-1.64] | 1.30*** | [1.15-1.46] | 1.06 | [0.88-1.28] |
| Latine | 0.94 | [0.89-1.04] | 1.45** | [1.17-1.79] | 0.99 | [0.88-1.11] | 0.74** | [0.61-0.91] |
| Gender (1=woman) | 1.29*** | [1.24-1.35] | 1.35*** | [1.17-1.56] | 0.98 | [0.89-1.07] | 1.00 | [0.86-1.16] |
| Age (ref=18-34 years) | | | | | | | | |
| 35-49 years | 1.77*** | [1.68-1.86] | 4.17*** | [3.32-5.24] | 2.62*** | [2.39-2.86] | 1.70*** | [1.42-2.05] |
| 50+ years | 3.43*** | [3.27-3.61] | 11.91*** | [9.51-14.91] | 7.26*** | [6.57-8.03] | 6.18*** | [5.18-7.38] |
| Education (ref=<high school) | | | | | | | | |
| High school | 0.97 | [0.93-1.01] | 0.89 | [0.76-1.04] | 1.01 | [0.92-1.10] | 1.03 | [0.88-1.21] |
| Some college | 1.05 | [1.00-1.11] | 1.05 | [0.88-1.26] | 1.09 | [0.97-1.22] | 1.37** | [1.15-1.64] |
| College degree or higher | 1.07 | [0.99-1.16] | 1.21 | [0.95-1.55] | 1.09 | [0.92-1.29] | 1.28 | [1.00-1.65] |
| Constant | 0.51*** | [0.48-0.54] | 0.02*** | [0.01-0.02] | 0.14*** | [0.13-0.16] | 0.04*** | [0.03-0.05] |
| Inflate model constant | -2.07*** | [-2.25--1.89] | | | | | | |

Source: Author's calculations using data from the 2016 Survey of Prison Inmates.

Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.

[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A10. Intersecting Nativity and Citizenship Differences in Number of Chronic Conditions, Diabetes, Hypertension, and Heart Conditions among 2016 National Health Interview Survey and 2016 Survey of Prison Inmates Samples, Combined (n=55926)

| | Panel A: Number of Chronic Conditions[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|
| | Incidence rate ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] | Odds ratio | [CI] |
| Incarceration status | 0.97 | [0.93-1.01] | 0.74*** | [0.65-0.84] | 0.90* | [0.82-0.99] | 0.70*** | [0.62-0.79] |
| Nativity & citizenship | | | | | | | | |
|   Foreign-born citizen | 0.78*** | [0.73-0.83] | 0.97 | [0.80-1.18] | 0.77*** | [0.67-0.89] | 0.68** | [0.55-0.85] |
|   Foreign-born noncitizen | 0.60*** | [0.54-0.67] | 0.63** | [0.47-0.84] | 0.57*** | [0.47-0.70] | 0.55*** | [0.40-0.75] |
| Race/ethnicity (ref=white) | | | | | | | | |
|   Black | 1.08** | [1.03-1.13] | 1.69*** | [1.46-1.97] | 1.70*** | [1.51-1.90] | 0.78** | [0.67-0.91] |
|   Other race | 0.91* | [0.84-0.99] | 1.27 | [0.99-1.62] | 1.10 | [0.93-1.30] | 0.65** | [0.49-0.85] |
|   Latine | 0.92** | [0.86-0.98] | 1.52*** | [1.26-1.83] | 0.99 | [0.86-1.13] | 0.67*** | [0.55-0.83] |
| Gender (1=woman) | 1.04** | [1.01-1.08] | 0.88** | [0.79-0.97] | 0.82*** | [0.76-0.87] | 0.82*** | [0.75-0.89] |
| Age (ref=18-34 years) | | | | | | | | |
|   35-49 years | 1.99*** | [1.86-2.13] | 3.74*** | [2.85-4.91] | 3.57*** | [3.13-4.06] | 2.16*** | [1.75-2.67] |
|   50+ years | 4.45*** | [4.20-4.71] | 12.70*** | [9.93-16.23] | 12.68*** | [11.28-14.24] | 7.21** | [6.05-8.60] |
| Education (ref=<high school) | | | | | | | | |
|   High school | 0.84*** | [0.80-0.88] | 0.69*** | [0.59-0.81] | 0.70*** | [0.63-0.79] | 0.70*** | [0.60-0.80] |
|   Some college | 0.85*** | [0.81-0.89] | 0.66*** | [0.57-0.77] | 0.66*** | [0.59-0.75] | 0.71*** | [0.62-0.82] |
|   College degree or higher | 0.69*** | [0.66-0.72] | 0.41*** | [0.35-0.48] | 0.47*** | [0.42-0.53] | 0.53*** | [0.46-0.62] |
| Constant | 0.48*** | [0.45-0.52] | 0.03*** | [0.02-0.03] | 0.14*** | [0.12-0.16] | 0.06*** | [0.05-0.08] |
| Inflate model constant | -2.66*** | [-2.86--2.46] | | | | | | |

Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.

Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed.

[a] Results from zero-inflated Poisson regression; results in all other panels from logistic regressions. Number of chronic conditions is an index count ranging from 0-4+ that includes diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.

Table A11. Effect of Incarceration Status, Nativity, and Citizenship on Presence of Chronic Condition, Diabetes, Hypertension, and Heart Conditions with Three-Way Interaction Models: Weighted Coefficients from Logistic Regressions (n=55926)

| | Panel A: Presence of Chronic Condition[a] | | Panel B: Diabetes | | Panel C: Hypertension | | Panel D: Heart Condition | |
|---|---|---|---|---|---|---|---|---|
| | Unstandardized Coefficient | [CI] | Unstandardized Coefficient | [CI] | Unstandardized Coefficient | [CI] | Unstandardized Coefficient | [CI] |
| Incarcerated | -0.04 | [-0.14-0.05] | -0.33*** | [-0.46--0.20] | -0.12* | [-0.21--0.02] | -0.38*** | [-0.51--0.26] |
| Race/ethnicity (ref=white) | | | | | | | | |
|   Black | 0.16** | [0.05-0.27] | 0.53*** | [0.38-0.67] | 0.53*** | [0.41-0.64] | -0.24** | [-0.39--0.09] |
|   Other race | -0.04 | [-0.20-0.12] | 0.24 | [-0.01-0.48] | 0.09 | [-0.08-0.26] | -0.43** | [-0.70--0.16] |
|   Latine | -0.20** | [-0.32--0.07] | 0.42*** | [0.23-0.60] | -0.02 | [-0.15-0.12] | -0.39*** | [-0.60--0.19] |
| Gender (1=woman) | 0.08* | [0.01-0.15] | -0.13** | [-0.23--0.03] | -0.20*** | [-0.27--0.14] | -0.20*** | [-0.29--0.11] |
| Age (ref=18-34 years) | | | | | | | | |
|   35-49 years | 0.77*** | [0.68-0.87] | 1.32*** | [1.05-1.59] | 1.27*** | [1.14-1.40] | 0.77*** | [0.56-0.98] |
|   50+ years | 2.14*** | [2.05-2.22] | 2.54*** | [2.30-2.79] | 2.54*** | [2.42-2.66] | 1.98*** | [1.80-2.15] |
| Education (ref=<HS) | | | | | | | | |
|   High school | -0.25*** | [-0.37--0.13] | -0.37*** | [-0.52--0.22] | -0.35*** | [-0.47--0.24] | -0.36*** | [-0.51--0.22] |
|   Some college | -0.22*** | [-0.34--0.10] | -0.41*** | [-0.56--0.27] | -0.41*** | [-0.53--0.29] | -0.34*** | [-0.48--0.19] |
|   College degree or higher | -0.50*** | [-0.63--0.38] | -0.90*** | [-1.06--0.74] | -0.75*** | [-0.87--0.64] | -0.63*** | [-0.78--0.49] |
| Nativity & Citizenship | | | | | | | | |
|   Foreign-born#citizen | -0.56*** | [-0.70-0.43] | -0.03 | [-0.22-0.16] | -0.26*** | [-0.40--0.12] | -0.38** | [-0.60--0.16] |
|   Foreign-born#noncitizen | -0.83*** | [-1.00--0.66] | -0.47** | [-0.76--0.18] | -0.56*** | [-0.76--0.36] | -0.60*** | [-0.91--0.29] |
| Incarceration, Nativity, & Citizenship | | | | | | | | |
|   Incarcerated#foreign-born#citizen | 0.50*** | [0.26-0.73] | 0.22 | [-0.15-0.60] | 0.22 | [-0.06-0.51] | 0.41 | [-0.01-0.84] |
|   Incarcerated#foreign-born#noncitizen | 0.08 | [-0.13-0.28] | 0.27 | [-0.07-0.62] | 0.06 | [-0.18-0.30] | 0.22 | [-0.19-0.62] |
| Constant | -0.58*** | [-0.71--0.45] | -3.68*** | [-3.96-3.41] | -1.97*** | [-2.12--1.82] | -2.77*** | [-2.98--2.56] |

Source: Author's calculations using data from the 2016 National Health Interview Survey and 2016 Survey of Prison Inmates.
Notes: Weighted statistics. Respondents in the white, black, and other race categories identify as non-Latine. *p < .05; **p <.01; ***p <.001, tests are two-tailed. Results for all panels from logistic regressions.
[a] Presence of chronic condition is a binary variable measuring if respondents reported having any of the following conditions: diabetes mellitus, hypertension, heart conditions, arthritis, asthma, cancer, and stroke.