## Title

Self-reported Legal Status in the California Health Interview Survey: An evaluation of data quality and application towards adolescent mental health



## Author

Viana, Joseph Charles

## Publication Date

2018

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA

Los Angeles

# Self-reported Legal Status in the California Health Interview Survey: An evaluation of data quality and application towards adolescent mental health

A dissertation submitted in partial satisfaction of the

requirements for the degree of Doctor of Philosophy

in Health Policy and Management

by

Joseph Viana

2018

ABSTRACT OF THE DISSERTATION

Self-reported Legal Status in the California Health Interview Survey:

An evaluation of data quality and application towards adolescent mental health

by

Joseph Viana

Doctor of Philosophy in Health Policy and Management

University of California, Los Angeles, 2018

Professor Ninez A. Ponce, Chair

Legal status is an important social determinant of health for immigrants and children of immigrant parents, which is typically not measured in public health surveys. The sensitivity of legal status and presumed response behavior to relevant questions are primary reasons why this topic goes unmeasured. Changes in immigration enforcement likely impact the sensitivity of the topic and may compromise data quality, however, this is also likely when legal status matters most for health outcomes. This dissertation evaluates the response behavior to questions of citizenship and immigration status in the California Health Interview Survey and applies these data to identify mental health risks for Latino adolescents with an unauthorized parent.

The first study, *When we ask, do they answer? Item-nonresponse to questions of citizenship and immigration status in the California Health Interview Survey*, examined foreign-born survey participants who did not answer questions of citizenship and immigration status between 2001 and 2015. Nonresponse was low overall, however, increased over time and was largely attributable to respondents who were born in Mexico. The second study, *When they answer, should we listen? Examining the quality of self-reported citizenship and immigration status*, evaluated potential misreporting of legal status among Mexican-born participants between 2003 and 2015. This study utilized indirect estimation strategies which have been developed to produce profiles of the unauthorized population from surveys which do not ask legal status. Nearly a quarter of all Mexican-born participants reported that they were a non-citizen without a green card, and these participants were demographically similar to external profiles of the unauthorized population. Predicted probabilities of unauthorized status produced by the indirect estimation procedure indicated that the threat of extensive misreporting was low and consistent over time. These results, paired with the findings of low nonresponse, indicate that participants were willing to answer questions of citizenship and immigration status and that these data are fit for use.

The third paper, *Severe Psychological Distress Among Latino Adolescents with an Unauthorized Parent* examined adolescent mental health using data from 2007 to 2016 disaggregated by parental nativity and legal status. Multivariate logistic models indicated that Latino adolescents with an immigrant mother were less likely to report severe psychological distress and that children with an unauthorized father were more likely to report severe psychological distress. These findings reveal important heterogeneity among children in

immigrant households and demonstrates the value of measuring legal status in a population survey.

It is critical that data used to monitor public health trends more fully incorporate immigrants and their children by measuring domains which are relevant to their health and wellbeing. In addition to measuring what needs to be measured, researchers should continue to critically evaluate quality and put data which are fit to use to meaningful and timely use.

The dissertation of Joseph Viana is approved.

Arturo Vargas Bustamante

Paul J. Chung

Steven P. Wallace

Ninez A. Ponce, Committee Chair

University of California, Los Angeles

2018

## TABLE OF CONTENTS

## LIST OF FIGURES, TABLES, AND APPENDICES

## ACKNOWLEDGEMENTS

This work was supported in part by a pre-doctoral training grant from the National Institutes of Health/National Center for Advancing Translational Science, awarded to the University of California, Los Angeles Clinical Translational Science Institute [grant number: TL1TR000121]. First, I would like to thank the thousands of Californians who volunteered their time and stories to the California Health Interview Survey and pledge that we will continue to work towards a healthier California.

Dr. Ninez Ponce has provided tremendous support throughout the dissertation process and in my development as a researcher. I also am indebted to the rest of my committee for their broad expertise and thoughtful feedback. Thank you to the staff and faculty at the UCLA Center for Health Policy Research; particularly Hala Douglas for her home cooked meals. Drs. Wendy Slusser and Rebacca Dudovitz at UCLA, Drs. Amy Szarkowski and Terrell Clark at Children's Hospital Boston as well as Drs. Nancy Rigotti and Sue Regan at Massachusetts General Hospital have given me the mentorship and opportunities which have brought me to this point.

Most importantly, I want to thank my mom and dad for always being there for me.

## VITA

**EDUCATION**

**2009 Brandeis University**
Bachelors of Arts, Psychology
Cum Laude

**EMPLOYMENT**

**2018-2013 Graduate Student Researcher**
California Health Interview Survey
UCLA Center for Health Policy Research

**2009-2012 Clinical Research Coordinator**
Mongan Institute for Health Policy
Massachusetts General Hospital

**2008-2009 Production Assistant**
Division of Deaf and Hard of Hearing
Children's Hospital Boston

**SELECT PEER-REVIEWED PUBLICATIONS**

**Viana JC**, Leonard SA, Kitay B, Ansel D, Angelis P, Slusser W. Healthier Vending Machines: An evaluation of effectiveness and financial viability. *Appetite*. 2017.

Jans M, **Viana JC**, Grant D, Cochran SD, Lee AC, Ponce NA. Trends in Sexual Orientation Missing Data Over a Decade of the California Health Interview Survey. *American Journal of Public Health.* 2015.

Rigotti NA, Regan S, Levy DE, Japuntich S, Chang Y, Park ER, **Viana JC,** Kelley JH, Reyen M, Singer DE. Effect of a sustained care intervention on post-discharge smoking cessation among hospitalized adults: a randomized clinical trial. *Journal of the American Medical Association*. 2014.

Regan S, **Viana JC,** Reyen M, Rigotti NA. Prevalence and Predictors of Smoking by Inpatients During a Hospital Stay. *Archives of Internal Medicine*. 2012.

**SELECT FELLOWSHIPS & AWARDS**

2016 California Immigration Research Initiative Graduate Student Fellowship
2016 University of California Global Food Initiative "30 Under 30" recipient
2015 University of California Graduate Summer Research Mentorship
2014 CTSI TL1 Translational Science Training Fellowship
2013 *AcademyHealth* Presidential Scholarship for Child Health Policy
2012 *AcademyHealth* Services Research Traineeship
2012 UCLA Child and Family Health Training Leadership Program Recipient
2011 Best Poster in Abstracts, Regional Meeting, Society of General Internal Medicine
2008 Undergraduate Research Program Recipient, Brandeis University, Waltham, MA

## CHAPTER 1: Introduction

Population surveys are an important tool in public health monitoring and surveillance.[1,2] Through repeated and systematic measurement, these data enable public health researchers and practitioners to identify emerging health issues as well as health disparities. Population surveys have and will continue to expand the scope of what they measure to continue to provide data which are valuable and relevant to current health issues and changing populations.[3] An important area of growth for population health surveys, as well as all health surveillance systems, will be to more fully incorporate immigrant populations. In a recent review of health surveillance systems conducted by the Centers for Disease Control and Prevention, most lacked measures of nativity, primary language, years of residence, or immigration status.[4] These domains are known to be important determinants of health and their measurement as essential to achieving health equity.[5]

Measuring these domains is also important to understand and appropriately monitor the health of children of immigrant parents. Roughly 18 million children in the United States has an immigrant parent, accounting for a quarter of all children in the United States.[6] Despite their numbers, there are limited health data available on children in immigrant families and most do not measure immigration-related characteristics of their parents.[7] Some progress can be made with relatively simple changes. Most health surveillance systems are only offered in English,[4] however one in five children of immigrants live in linguistically isolated households.[8] Other forms of progress will require that we reconsider what immigration-related data can and should be measured.

Among these topics, legal status is measured least often. Legal status, which incorporates naturalized citizenship, permanent and temporary lawful status as well as unauthorized status,[9] is an important social determinant of health which stratifies the noncitizen population by rights and

access to employment, education and public benefits.[10] The vast majority of children of immigrants are citizens, however their growth and well-being are shaped by the legal status of their parents. Of the 18 million children in the U.S. with an immigrant parent, roughly 12 million are the child of a noncitizen,[11] of which an estimated 5 million[12] are the child of an unauthorized immigrant. Increasingly, researchers and advocates are calling for this data to be collected to enable meaningful research on immigrant adults and for children of immigrant parents.[4,7,13,14]

While the importance of considering legal status as a social determinant of health for immigrants and their children is widely agreed on, whether and how these data can be collected is a matter of debate. A fundamental reason has to do with the sensitivity of legal status; whether these data can be collected in a way that assures individual confidentiality and protection from use from third-parties, as well how immigrants would perceive these risks in their decision to disclose their legal status. The prevailing assumption has been that direct questions regarding legal status would be overly sensitive, prone to undesirable response behavior and ultimately poor data quality. As a result, there are few surveys which ask these questions and by extension few opportunities to test our assumptions regarding response behavior.

An important exception is the 2014 paper *Can We Measure Immigrants' Legal Status? Lessons from Two U.S. Surveys,*[15] which reported on the response behavior to questions of legal status in the Survey of Income and Program Participation (SIPP) and the Los Angeles Family and Neighborhood Survey (LAFANS). The authors found that contrary to popular expectations, participants to these surveys were willing to answer questions related to legal status and that their responses produced profiles of the unauthorized population which were consistent with previous estimates. While neither SIPP or LAFANS are suitable for public health monitoring, this evaluation of response behavior and data quality serves as a proof of concept that population

surveys can in fact measure legal status and has lent credibility to analyses which use these data to study the impact of legal status for immigrants and their children.

There are two important concerns regarding the generalizability of these findings. First, question sensitivity often depends on the context it is asked and can vary between surveys.[16] Considering the long-standing and legitimate concerns that legal status is too sensitive a topic, it is important to replicate their findings in other surveys. Second and perhaps more urgently, the legal status data they analyzed were collected between 2000 and 2004 - the very beginning of a significant increase in immigration enforcement over the following decade. After the September 11th terrorist attacks in 2001, a variety of policies were enacted which substantially increased the detention and deportation of removable noncitizens, ultimately resulting in more than a doubling of deportations annually by 2012.[17] (Revving the Machine, 2017). These shifts are discussed more substantially later in this chapter.

Changes in immigration enforcement and the threat of deportation also have health implications for unauthorized immigrants and their families, particularly regarding their mental health. For example, DACA eligibility – and thereby temporary protection from deportation – has been causally attributed with significant declines in psychological distress among adults[18] as well as diagnoses of adjustment and anxiety disorders among their children.[19] The most recent use of population survey data to characterize the mental health of children of unauthorized parents is the 2015 paper *Behavioral Functioning Among Mexican-Origin Children: Does Parental Legal Status Matter?*,[20] which demonstrated with LAFANS data that children with an unauthorized parent were at increased risk for internalizing and externalizing behavioral problems. However, because these results are based on LAFANS data, they reflect the mental health of children in immigrant families prior to changes in immigration enforcement and less

representative of current mental health issues of children in immigrant families today. More timely monitoring of the mental health of children with an unauthorized parent is important, however this is dependent on the capacity to measure legal status even during times of increasing immigration enforcement.

This dissertation evaluates the quality of self-reported legal status in the California Health Interview Survey (CHIS) between 2001 and 2015 and uses these data to study the contemporary issue of psychological distress of children in immigrant families with an unauthorized parent. In this chapter, I provide an overview of legal status and the immigration enforcement policies which have given rise to significant changes in deportations over the past two decades. I then position immigration enforcement as a psychological stressor for children in immigrant families as well as a methodological concern in the collection of self-reported legal status, particularly as it relates to question sensitivity and data quality. Lastly, I provide an overview of the California Health Interview Survey and how it has measured legal status, as well as review key terminology used throughout the dissertation.

## Legal Status and Immigration Enforcement

### Classification of legal status

Legal status is a marker of the rights of noncitizens in the United States.[21] Immigrant legal categories are broadly either permanent, temporary, discretionary or undocumented.[9] *Permanent status* (LPR status or having a green card) has historically been a path to citizenship, and while it is the "strongest anchor" for noncitizens, those with permanent status do not have the legal right to remain. They also are unable to vote and have limited access to certain public benefits. *Temporary status* primarily includes employment or educational visas and Temporary Protected Status (TPS). Certain visas can be renewed, and visa holders can generally apply for

LPR status. TPS statuses are conferred to individuals who cannot safely return to their country for a variety of reasons. Individuals who overstay their temporary status generally become unauthorized. *Discretionary status* is temporary lawful status granted by the Executive branch, of which Deferred Action for Childhood Arrivals (DACA) is a contemporary example. Individuals who are *unauthorized* lack any of the statuses listed above, and while they have constitutional rights protected by the Equal Protection Clause of the 14th Amendment, they have few legal rights and are inherently at risk for deportation by virtue of their status. While the threat of deportation is not unique to the unauthorized – an estimated 10% of deportations each year are LPRs[22] – immigration enforcement and the threat of deportation is a hallmark of unauthorized status.

Immigration Enforcement: History

The current system of immigration enforcement is the product of policies and legislation which have occurred over the past few decades.[23] The Immigration Reform and Control Act of 1986 established key provisions to increase border enforcement, imposed federal and civil penalties for hiring unauthorized workers while also effectively providing amnesty to millions of unauthorized persons who immigrated prior to 1982. A decade later, the Illegal Reform and Immigrant Responsibility Act as well as the Anti-terrorism and Effective Death Penalty Act substantially increased the risk of deportation by requiring mandatory detention and deportation of noncitizens who have ever been convicted of a broad category of offenses, including many minor non-violent offenses and misdemeanors – and reduced the discretion of immigration judges in immigration court proceedings.

This relationship between immigration enforcement and the criminal justice system is also exemplified by the broad network of "agreements of cooperation" between local law

enforcement and Immigration and Customs Enforcement.[24] Most significantly, these include the 287(g) Program, Criminal Alien Program, and the Secure Communities Program. These programs differ in their scope and execution, however collectively they are responsible for the majority of immigration enforcement in the interior as opposed to the border. The 287(g) Program – initially part of the Immigration and Nationality Act and later codified by the Illegal Immigration Reform and Immigrant Responsibility Act – deputizes local law enforcement officers to act as immigration agents, including issuing detainers or directly transferring noncitizens into ICE custody. In contrast, the Criminal Alien Program (CAP) operates within volunteering jails and prisons to identify and initiate removal of eligible noncitizens. Through the expansion of offenses warranting deportation and dramatic increases in funding between 2004 and 2008, CAP has become the primary avenue of deportations from the interior. More recently, Secure Communities adds a significant technological aspect by enabling volunteering jails and prisons to compare all arrested individual's fingerprints with the Department of Homeland Security databases.

Collectively, these policies contributed to significant increases in deportations.[25] Roughly 160 thousand deportations occurred in 2003, however this figure more than doubled to over 380 thousand by 2008. For the next four years, roughly 400 thousand deportations a year occurred, which received substantial media attention and criticism from immigrant advocates. There were also substantial shifts in the geography of enforcement. Notably, the number of deportations from the interior was relatively stable between 2003 and 2006 at roughly 100 thousand per year, however, increased by half in 2007 (175 thousand) to a high of over 200 thousand between 2008 and 2011. Between 2012 and 2016, several executive actions and statements redirected immigration enforcement which resulted in decreases in total deportations, and particularly

deportations from the interior. This include the announcement of the Deferred Action for Childhood Arrivals program (DACA) in 2012, and reforms of deportation priorities announced in 2014 which targeted recent arrivals as well as those with more serious criminal records.[26]

The geography of immigration enforcement likely is of particular relevance for the five million children living across the United States with an unauthorized parent. Generally, border immigration enforcement is carried out by U.S. Customs and Border Protection (CBP), and usually targets recent arrivals or those attempting to enter, although interior checkpoints can occur anywhere within 100 miles of a US border. In contrast, Immigration and Customs Enforcement (ICE) targets individuals from the interior, including those who have been living in the United States for years and have U.S. citizen children.

Between 1998 and 2007, over 180 thousand deportations involved an adult claiming at least one U.S. citizen child, with roughly 20 thousand of such deportations occurring per year between 2003 and 2007.[27] However, data collected during this period were voluntary, and likely undercounts the true prevalence. Congress required that ICE make these data mandatory as of July 1st 2010;[28] the first published report on these data revealed that between FY 2011 and 2012, over 80 thousand deportations involved an adult claiming a U.S. citizen child annually.[29] Subsequent reports released by ICE – although difficult to find and trend due to differences in presenting statistics in calendar and fiscal years – shows a consistent decline in the number of these removals, which likely reflects declines in removals from the interior overall. While ICE is required to record these data, figures are still speculative because parents may be reluctant to report having children to ICE and because statistics reflect individual removals, not unique individuals. Still, it is roughly estimated that more than half a million children have had a parent deported between 2011 and 2015.[30]

Immigration Enforcement: Child Mental Health Consequences

This history of immigration enforcement has had significant consequences for children in immigrant families. The *deportation pyramid* provides a useful framework to conceptualize both the types of children who have been impacted as well as the mechanisms by which immigration enforcement negatively impacts health.[31] At the top of the pyramid are children who have faced the most direct and severe consequence of having their parent – most typically their father – arrested and deported. In addition to the significant trauma of being separated from their parent, these children also experience quick and severe drops in household income, resulting in housing and food insecurity. Ultimately, some of these children are reunited with their parent, others relocate to their parent's origin country, while others are permanently separated from their parents.

While these children face the most severe consequences, the greater societal burden has fallen on the larger number of children at the base of the pyramid. An estimated 5.1 million children under the age of 18 live with an unauthorized parent and live under a persistent threat of immigration enforcement. Ethnographic studies have consistently documented that these children who fear that their parent could be detained or deported exhibit significant psychological consequences which is often comparable to children who have experienced this trauma firsthand. Nearly all of this research is sourced from fieldwork in communities impacted by recent immigration enforcement operations such as a workplace raid.[30] These studies provide timely and insightful data regarding the mental health consequences of immigration enforcement, however they are not designed to be representative of the large population of children with an unauthorized parent. Also, to the extent that these studies follow in the wake of immigration

enforcement, their results may not be generalizable to describing the psychological consequences of these children under more general circumstances.

In addition to continued ethnographic research, there are calls to include legal status to be incorporated in the larger, population surveys that are increasingly relied on to monitor health status and inform public policy. To date, very few population surveys have included questions regarding legal status largely because of a long-held assumption that the topic is too sensitive and would be prone to poor response behavior. This presents the pragmatic question of whether direct questions regarding legal status in population surveys can produce data that is of value. The following section briefly reviews the literature regarding surveying sensitive topics.

**Surveying Sensitive Topics**

Classification of Question Sensitivity

A widely referenced framework for describing sensitive topics was proposed by Tourangeau, Rips and Rasinkski.[32] They describe sensitive questions as being *intrusive, socially undesirable,* or involving a *threat of disclosure.* Intrusiveness describes a "taboo" topic which is perceived to be a private matter regardless of the correct answer. Sexual preferences and behaviors are an often-cited example of a potentially taboo survey question. Social undesirability describes attitudes or behaviors that are clearly against general social norms and expectations. A typical example is voting behavior, where the social expectation is that voting is a civic duty; reporting that you did not vote is thereby socially undesirable. Threat of disclosure describes the fear of repercussions should a third party outside of the interview setting have access to the answers. An example would be the concern that admitting to using illegal drugs could result in losing a job. More succinctly, sensitive questions are "a broad category [of questions] that encompasses not only questions that trigger social desirability concerns but also those that are

seen as intrusive by the respondents or that raise concerns about the possible repercussions of disclosing the information."[33]

Undesirable Response Behavior to Sensitive Questions

When presented with any question, a survey participant makes a decision as to whether they will provide a true answer, provide a false answer, or not provide an answer at all.[34] These latter two choice options, referred to nonresponse and misreporting, are the primary focus of the literature on surveying sensitive questions.[33] Nonresponse is clearly identifiable whereas misreporting is notoriously difficult to assess, however both contribute to measurement error and ultimately data quality.

Item-nonresponse carries the practical consequence of having less data available for analysis. This can be problematic when item-nonresponse is particularly large and/or when the data are not missing at random. In addition to the immediate practical consequences, item-nonresponse is often used as an indicator of question sensitivity. There is no agreed-upon cutoff for what level of item-nonresponse is considered to be problematic or that a question is "sensitive", however item-nonresponse is instructive when the patterns of missingness are examined.[35] This can include characteristics of the participants who choose to not answer, trends in nonresponse to the same question over time, and comparisons of nonresponse to other questions.

Misreporting, or the intentional reporting of false information, is the second and arguably more likely form of evasive behavior. Compared to nonresponse, misreporting is inherently difficult to study because it generally requires that the true value be known to the researchers. A basic assumption in assessing misreporting to a potentially sensitive question is a "more is better" assumption, where higher rates of what is anticipated to be the undesirable or under-

reported responses are considered to be closer to the true population value than lower values. As a simple example, higher self-reported rates of illicit-drug use would be interpreted as more accurate than lower self-reported rates.

**Legal status as a sensitive Question**

Whereas intrusiveness and social undesirability are inherently subjective, the threat of disclosure of legal status involves a remote but real possibility. This concern was echoed by researchers in an open letter entitled "Collection of Legal Status Information: Caution!", which advised that additional legal protections are necessary to protect research participants who report their legal status.[36] The advice to acquire a Certificate of Confidentiality from the Department of Health and Human Services to protect against a court subpoena underscores why legal status questions are innately sensitive. Threats regarding the misuse of legal status data would be salient for noncitizens and particularly for the unauthorized. Noncitizens may worry that self-disclosure may somehow compromise future naturalization, however unauthorized individuals may worry that self-disclosure may jeopardize their US residency. While the responsibility to protect participants from any threat of disclosure falls on the researcher, the decision as to how to respond to the question is that of the survey participant.

**Conceptual Framework and Dissertation Aims**

An adult's unauthorized status may cause their child to fear that their family could be separated, resulting in greater psychological distress and worse mental health for children of unauthorized parents. Simultaneously, an adult's unauthorized status may cause them to perceive questions regarding legal status to be overly sensitive, which may result in poor response behavior including nonresponse or misreporting. This in turn results in worse data quality, compromising the ability to measure and study the impacts of unauthorized status. These

associations are likely moderated by changes in immigration enforcement, such that increased immigration enforcement may increase both the potential for worse data quality and increased psychological distress for their children (Figure 1).

This dissertation aims to assess the quality of self-reported legal status over time and to use these data to evaluate the role that having an unauthorized parent has on the mental health of children. In the second chapter, I report on non-response to questions of citizenship and immigration status over time. In the third chapter, I evaluate potential misreporting of legal status among Mexican-born respondents. In the fourth chapter, I evaluate the propensity of severe psychological distress among Latino adolescents by the legal status of their parents. In the fifth chapter, I review my findings and contextualize the results in light of current events and contemporary concerns regarding the mental health of children in immigrant families.

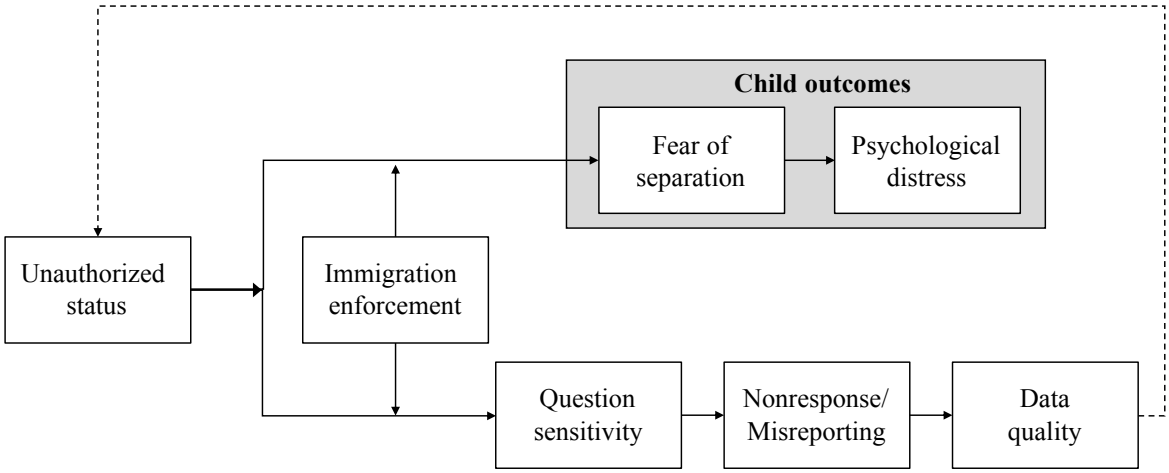
**The California Health Interview Survey**

The California Health Interview Survey (CHIS) is a random-dial telephone health survey which is representative of the non-institutionalized population of California. It is the nation's largest continuous state health survey with separate surveys for one adult, adolescent and child of a sampled household. The CHIS was conducted biennially between 2001 and 2009 until switching towards continuous data collection in 2010. It is conducted through the University of California Los Angeles Center for Health Policy Research and is funded by multiple public, private agencies. The CHIS is conducted in several languages in addition to English, including Spanish, Tagalog, Vietnamese, Korean as well as Mandarin and Cantonese.

Adult CHIS participants are asked to report their country of birth, and those who are born outside of the United States or its territories as well as participants who do not answer the question are eligible for the subsequent immigration module. The CHIS has asked direct

questions regarding citizenship and permanent residency status throughout its entire history, with minor wording changes between the 2001, 2003, and 2005 surveys. These question wordings are presented in Appendix 1.1. As of 2005, questions in the immigration module read as follows: **"The next questions are about citizenship and immigration. Are you a citizen of the United States?** *[if participant did not answer "YES"]* **Are you a permanent resident with a green card?" Your answers are confidential and will not be reported to Immigration Services."** The answer set to both questions include Yes, No, Application Pending, Don't Know and Refused. Permanent residency was asked only of participants who did not actively report that they are a citizen. Throughout this dissertation, we use the terms *citizenship* to describe "citizen of the United States", *immigration status* to describe "permanent residency with a green card", and *legal status* to describe the overall construct of citizenship and immigration status.

Figure 1.1 Conceptual Model: Unauthorized status, data quality, child mental health and immigration enforcement



**Appendix 1.1 Question wording for citizenship and immigration status in the California Health Interview Survey by Survey Cycle**

Cycle 2001:
"The next questions are about citizenship and immigration status. Your answers are confidential, will not be reported to the INS, and will only be used for statistical purposes. Are you a citizen of the United States?"

"Are you a permanent resident with a green card?"

Cycle 2003:
"The next questions are about citizenship and immigration. Your answers are confidential and will not be reported to the INS. Are you a citizen of the United States?"

"Are you a permanent resident with a green card?"

Cycles 2005-2016:
"The next questions are about citizenship and immigration. Are you a citizen of the United States?"

"Are you a permanent resident with a green card? Your answers are confidential and will not be reported to Immigration Services."

## References


1. Buehler JW, Centers for Disease Control and Prevention. CDC's vision for public health surveillance in the 21st century. Introduction. *MMWR Suppl*. 2012;61(3):1-2.
2. Lau DT. Advancing the Field of Public Health Surveillance and Survey Methods. *Am J Public Health*. 2017;107(6):822-822. doi:10.2105/AJPH.2017.303799
3. Lexicon, Definitions, and Conceptual Framework for Public Health Surveillance. https://www.cdc.gov/mmwr/preview/mmwrhtml/su6103a3.htm. Accessed April 13, 2018.
4. Rodriguez-Lainz A, McDonald M, Fonseca-Ford M, et al. Collection of Data on Race, Ethnicity, Language, and Nativity by US Public Health Surveillance and Monitoring Systems: Gaps and Opportunities. *Public Health Rep Wash DC 1974*. 2018;133(1):45-54. doi:10.1177/0033354917745503
5. Richardson LD. Integrating Health Equity Into Practice and Policy. *J Public Health Manag Pract JPHMP*. 2016;22 Suppl 1:S107-109. doi:10.1097/PHH.0000000000000372
6. Children in U.S. Immigrant Families | migrationpolicy.org. https://www.migrationpolicy.org/programs/data-hub/charts/children-immigrant-families. Accessed April 12, 2018.
7. Mendoza FS. Health Disparities and Children in Immigrant Families: A Research Agenda. *Pediatrics*. 2009;124(Supplement 3):S187-S195. doi:10.1542/peds.2009-1100F
8. Children of Immigrants Data Tool. http://datatool.urban.org/charts/datatool/pages.cfm. Accessed April 12, 2018.
9. National Academies of Sciences E. *The Integration of Immigrants into American Society*.; 2015. doi:10.17226/21746
10. Torres JM, Young M-ED. A life-course perspective on legal status stratification and health. *SSM - Popul Health*. 2016;2:141-148. doi:10.1016/j.ssmph.2016.02.011
11. Dec 13 P, 2017. Health Coverage of Immigrants. *Henry J Kais Fam Found*. December 2017. https://www.kff.org/disparities-policy/fact-sheet/health-coverage-of-immigrants/. Accessed March 19, 2018.
12. A Profile of U.S. Children with Unauthorized Immigrant Parents. migrationpolicy.org. http://www.migrationpolicy.org/research/profile-us-children-unauthorized-immigrant-parents. Published January 11, 2016. Accessed June 18, 2016.
13. Massey Douglas S., Bartley Katherine. The Changing Legal Status Distribution of Immigrants: A Caution. *Int Migr Rev*. 2006;39(2):469-484. doi:10.1111/j.1747-7379.2005.tb00274.x
14. Yoshikawa H, Suárez-Orozco C, Gonzales RG. Unauthorized Status and Youth Development in the United States: Consensus Statement of the Society for Research on Adolescence. *J Res Adolesc*. 2017;27(1):4-19. doi:10.1111/jora.12272
15. Bachmeier JD, Van Hook J, Bean FD. Can We Measure Immigrants' Legal Status? Lessons from Two U.S. Surveys. *Int Migr Rev*. 2014;48(2):538-566. doi:10.1111/imre.12059
16. Renzetti C, Lee R. Researching Sensitive Topics. *CRVAW Fac Book Gallery*. January 1993. http://uknowledge.uky.edu/crvaw_book/14.
17. Randy Capps, Muzaffar Chishti, Julia Gelatt, Jessica Bolter, Ariel G. Ruiz Soto. *Revving Up the Deportation Machinery: Enforcement under Trump and the Pushback*. Washington, D.C.: Migration Policy Institute; 2018. https://www.migrationpolicy.org/research/revving-deportation-machinery-under-trump-and-pushback. Accessed June 5, 2018.

18. Venkataramani AS, Shah SJ, O'Brien R, Kawachi I, Tsai AC. Health consequences of the US Deferred Action for Childhood Arrivals (DACA) immigration programme: a quasi-experimental study. *Lancet Public Health*. 2017;2(4):e175-e181. doi:10.1016/S2468-2667(17)30047-6
19. Hainmueller J, Lawrence D, Martén L, et al. Protecting unauthorized immigrant mothers improves their children's mental health. *Science*. 2017;357(6355):1041-1044. doi:10.1126/science.aan5893
20. Landale NS, Hardie JH, Oropesa RS, Hillemeier MM. Behavioral Functioning among Mexican-origin Children Does Parental Legal Status Matter? *J Health Soc Behav*. 2015;56(1):2-18. doi:10.1177/0022146514567896
21. Young M-EDT, Madrigal DS. Documenting legal status: a systematic review of measurement of undocumented status in health research. *Public Health Rev*. 2017;38. doi:10.1186/s40985-017-0073-4
22. Baum J, Jones R, Barry C. *In the Child's Best Interest? The Consequences of Losing a Lawful Immigrant Parent to Deportation*. Chief Justice Earl Warren Institute on Race, Ethnicity and Diversity; 2010. https://eric.ed.gov/?id=ED536693. Accessed February 6, 2018.
23. Doris Meissner, Donald M Kerwin, Muzaffar Chishti, Clarie Bergeron. *Immigration Enforcement in the United States: The Rise of a Formidable Machinery*. Washington, DC: Migration Policy Institute; 2013. https://www.migrationpolicy.org/research/immigration-enforcement-united-states-rise-formidable-machinery.
24. Melissa Keaney, Joan Friedland. Overview of the Key ICE ACCESS Programs: 287(g), the Criminal Alien Program, and Secure Communities. November 2009. https://www.nilc.org/wp-content/uploads/2016/03/ice-access-2009-11-05.pdf.
25. Transactional Records Access Clearinghouse (TRAC), Immigration, ICE Removals - All, More Complete Historical Data. http://trac.syr.edu/immigration/. Accessed May 24, 2018.
26. Bolter MC Sarah Pierce Muzaffar Chishti, Sarah Pierce, and Jessica. The Obama Record on Deportations: Deporter in Chief or Not? migrationpolicy.org. https://www.migrationpolicy.org/article/obama-record-deportations-deporter-chief-or-not. Published January 25, 2017. Accessed May 1, 2018.
27. Inspector General Richard L. Skinner. *Removals Involving Illegal Alien Parents of United States Citizen Children*. U.S. Department of Homeland Security; 2009. https://www.oig.dhs.gov/assets/Mgmt/OIG_09-15_Jan09.pdf.
28. House Report 111-298 - DEPARTMENT OF HOMELAND SECURITY APPROPRIATIONS ACT, 2010. https://www.gpo.gov/fdsys/pkg/CRPT-111hrpt298/html/CRPT-111hrpt298.htm. Accessed May 30, 2018.
29. Wessler S. Primary Data: Deportations of Parents of U.S. Citizen Kids. Colorlines. https://www.colorlines.com/articles/primary-data-deportations-parents-us-citizen-kids. Published December 17, 2012. Accessed May 30, 2018.
30. Implications of Immigration Enforcement Activities for the Well-Being of Children in Immigrant Families: A Review of the Literature. migrationpolicy.org. http://www.migrationpolicy.org/research/implications-immigration-enforcement-activities-well-being-children-immigrant-families. Published September 17, 2015. Accessed June 18, 2016.
31. Dreby J. The Burden of Deportation on Children in Mexican Immigrant Families. *J Marriage Fam*. 2012;74(4):829-845. doi:10.1111/j.1741-3737.2012.00989.x

32. Tourangeau R, Rips LJ, Rasinski K. *The Psychology of Survey Response*. Cambridge University Press; 2000.
33. Tourangeau R, Yan T. Sensitive questions in surveys. *Psychol Bull*. 2007;133(5):859-883. doi:10.1037/0033-2909.133.5.859
34. Tourangeau R, Groves RM, Redline CD. Sensitive Topics and Reluctant RespondentsDemonstrating a Link between Nonresponse Bias and Measurement Error. *Public Opin Q*. 2010;74(3):413-432. doi:10.1093/poq/nfq004
35. de Leeuw E, Hox J, Huisman M. Prevention and Treatment of Item Nonresponse. *J Off Stat*. 2003;19(2):153-176.
36. Carter-Pokras O, Zambrana RE. COLLECTION OF LEGAL STATUS INFORMATION: CAUTION! *Am J Public Health*. 2006;96(3):399. doi:10.2105/AJPH.2005.078253

## Chapter 2: When we ask, do they answer? Item-nonresponse to questions of citizenship and immigration status in the California Health Interview Survey

### Introduction

Applied research on immigrant populations in the U.S. is limited by lack of data on legal status.[1] Including direct questions about legal status in population surveys could improve our understanding of population health and immigrant incorporation to better inform public health decisions. However, many are concerned that these topics are too sensitive to ask.[2–4] Sensitive survey questions are those which are perceived to be intrusive, socially undesirable, or have some threat associated with disclosure. Questions on immigration status may be overly sensitive if survey participants perceive some sort of risk – such as legal risk – associated with answering the question. The extent to which survey participants choose to not answer a question – referred to in the survey literature as item-nonresponse – is a common indicator of sensitivity[5] and data quality.[6]

An expert panel convened by the Government Accountability Office suggested that response behavior to these questions would depend on the survey's organization and hypothesized that data quality would be favorable in academically-sponsored surveys relative to government-sponsored surveys. This hypothesis has been supported in the literature, with researchers finding lower rates of item-nonresponse to immigration related questions in the academically-sponsored Los Angeles Family and Neighborhood Survey (LAFANS) compared to the government-sponsored Survey of Income and Program Participation (SIPP). In LAFANS, rates of item-nonresponse to immigration related questions ranged from 3.7% to 12.4% which resulted in a total of 4.3% of foreign-born survey participants with an ambiguous immigration status due to item-nonresponse. In SIPP, item-nonresponse rates to comparable questions were as high as 27.2%, resulting in 12.7% of foreign-born survey participants had an ambiguous legal

status due to item-nonresponse. In addition, both surveys produced profiles of the unauthorized population which were consistent with external estimates, providing further evidence that these questions are feasible to ask. However, the researchers note that these data were collected between 2001 and 2004, and subsequent increases in immigration enforcement may impact response behavior. To our knowledge, this is the only study to evaluate the fundamental response behavior or whether survey participants answer questions regarding immigration status.

The present study describes whether foreign-born participants in the California Health Interview Survey (CHIS) respond to questions of citizenship and immigration status from 2001 to 2015. CHIS is university-based, conducted through the UCLA Center for Health Policy Research in collaboration with the California Department of Public Health and California Department of Health Care Services; as such CHIS occupies a unique space between the university- and government-sponsored domains. CHIS has asked questions on citizenship and permanent resident with a green card/Legal Permanent Residence (LPR) status using consistent methodology since 2001. CHIS is the nation's largest state health survey, conducted in the state with the nation's largest foreign-born and unauthorized populations, both in terms of absolute size and percent of total population.[7,8] This represents a unique opportunity to empirically study whether survey participants answer questions thought to be unaskable.

**Methods**

CHIS data files from 2001 to 2015 were appended and merged with survey paradata, which indicated whether an observed value was based on self-report or whether the question was not answered and later imputed. Survey participants who reported being born outside the US or territory as well as participants who did not provide an answer to their country of birth were asked whether they were a citizen. Those who did not affirmatively report that they were a

naturalized citizen, including those who did not provide an answer regarding their citizenship, were asked whether they are a permanent resident with a green card. A variable for the outcome of interest, item-nonresponse, was constructed for each question to identify participants who either refused to answer or replied that they did not know. Responses to these questions, including nonresponse, were analyzed for participants who reported being born in Mexico, China, and the Philippines, as these are California's largest immigrant groups,[9] and any Central American country, which collectively represented a sizeable portion of item-nonresponse.

Multivariate logistic models were conducted which included predictors of nonresponse which have been previously identified in the literature or are salient to foreign-born survey respondents. These covariates included age, sex, education, poverty status, English proficiency, and language of interview. Dummy variables for survey cycle were included to address potential trends over time. As preliminary analyses indicated that the majority of nonresponse was attributable to Mexican-born participants, models also included a binary indicator for being Mexican-born. Multivariate models were also run on the Mexican subsample, but not for other country/regions of birth due to sample size constraints. To track potential changes in nonresponse by survey cycle, predicted probabilities of nonresponse were calculated for each cycle based on the multivariate models to account for secular changes in the sample composition.

As this analysis is intended to describe response behaviors of CHIS participants as opposed to the state of California, results are unweighted. However, certain results presented in accompanying tables were calculated using CHIS survey weights with Taylor Series variance estimation to account for the complex survey design of CHIS[10] as a sensitivity analysis. All analyses were conducting using Stata 14.[11]

**Results**

A total of 344,205 CHIS participants were interviewed between 2001 and 2015, of which 81,144 (23.6%) reported being born outside the US and 454 (0.1%) did not report their country of birth, resulting in 81,598 participants who were eligible for the question regarding citizenship. Of these participants, 1,011 (1.24%) did not respond, and an additional 34,012 reported that they were not a citizen or their application was pending. Of the resulting 35,023 participants who were eligible for the following question regarding LPR status, 1,274 (3.64%) did not respond, of which the majority (n=815/1,274, 64%) had not responded to the previous question on citizenship either. Of the initial 81,598 who initiated the immigration module, 1.56% had an ambiguous immigration status due to item-nonresponse. Figure 2.1 illustrates the flow of survey participants through the immigration module.

CHIS participants from Mexico (n=30,120), Central America (n=5,535), China (n=4,638) and the Philippines (n=3,855) collectively accounted for 54.4% of all participants who reported being foreign-born. However, they accounted for 81.6% of item-nonresponse to the citizenship question and 85.1% of item-nonresponse to the question of LPR status. Item-nonresponse to the question of citizenship was 2.38% for participants born in Mexico, 1.34% for participants born in Central America, 0.50% for participants born in China and 0.29% for participants born in the Philippines. Item-nonresponse to the question of LPR status was 5.02% for participants born in Mexico, 3.08% for participants born in Central America, 1.21% for participants born in China and 1.52% for participants born in the Philippines.

Item-nonresponse to both citizenship and LPR questions was driven by Mexican-born participants, due both to their relative size (36.9% of all reported foreign-born) and their response behavior (Table 2.1). Of the 1,011 participants who did not respond to the question of

citizenship, 718 (71.1%) were Mexican-born. In addition, fewer Mexican-born participants reported that they were a naturalized citizen (36.25%) than participants from Central America (45.96%), China (71.52%) or the Philippines (77.76%), resulting in a relatively large number of Mexican-born participants who were eligible for the subsequent question on LPR status.

Participants with incomplete data on years of US residency were excluded from the multivariate models of citizenship (n=178) and LPR (n=87) nonresponse, resulting in analytic subsamples of 81,420 for the citizenship nonresponse model and 34,936 for the LPR nonresponse model (Table 2.2). In both the general and Mexico-specific multivariate models, participants who did not respond to the citizenship question were more likely to be younger than 50 years old, live in poorer households, conduct the interview in Spanish, and reside in the US between 6-10, but not 1-5 (versus 11+), years. The likelihood of nonresponse was significantly lower among participants age 65 or older, without a high school diploma or GED, and who chose to conduct the interview in an Asian language. Similar to the citizenship question, the likelihood of nonresponse to the LPR question was significantly higher among participants younger than the 50 years old, who lived in poorer households and who conducted the interview in Spanish, and was significantly lower among participants without a high school diploma or GED and who conducted the interview in an Asian language. Unlike the citizenship question, residing in the US for 6-10 years did not significantly predict nonresponse; however, participants residing in the US for fewer than 6 years were significantly less likely to not respond.

Item-nonresponse significantly increased between 2001 and 2015 for both citizenship and LPR questions. Figure 2.2 illustrates the trends in nonresponse to both questions using unadjusted as well as model-adjusted proportions of nonresponse. The largest significant

increase in nonresponse relative to the previous cycle occurred in 2007 for both citizenship ($chi^2$=22.86, p<0.001) and LPR ($chi^2$=62.00, p<0.001) status.

**Discussion**

Despite long-held assumptions that questions regarding citizenship and particularly immigration status are too sensitive to ask, I find that 98.4% of the over 80,000 foreign-born participants in the California Health Interview Survey reported their citizenship and/or immigration status. This result compares favorably to previous research evaluating response behavior in two earlier surveys,[3] and contributes to an empirical evidence base which suggests that these important questions can be asked in population surveys and population health surveys. The majority of nonresponse which did occur was attributable to Mexican-born participants, which is consistent with previous findings that reporting behavior to questions regarding naturalization in the American Community Survey is most problematic among this population.[12] Sample participants who chose to not respond to these questions were generally younger, came from poorer households and conducted the interview in Spanish.

Between 2001 and 2015, despite increased visibility,[13] improving public opinion[14] and more inclusive legislation for unauthorized immigrants in California, nonresponse significantly increased for both questions, from 1.07% to 2.8% for citizenship and 1.51% to 4.63% for LPR status. The largest significant increase in nonresponse occurred between the 2005 and 2007 cycles. While outside of the scope of this paper, this increase may reflect national trends in immigration-related arrests during this time.[15] Minor changes in question wording between the 2001, 2003 and 2005 cycles did not appear to meaningfully impact nonresponse. The American Community Survey, which asks about citizenship but not LPR status, also experienced

increasing nonresponse to the citizenship question from 0.4% in 2001 to 5.9% in 2015;[16] however, sizeable fluctuations did not coincide with those observed in CHIS.

Item-nonresponse is a common but incomplete measure of question sensitivity. Some have suggested that survey participants may be more inclined to misreport their status rather than not respond at all.[5] This is difficult to study as the true value is almost always unknown. As such, researchers often rely on a simple "more is better" assumption, where higher rates of what is thought to be sensitive or undesirable are considered to be more accurate than lower rates.[5] If the question of LPR status is perceived to be overly sensitive, we expect that responses should be biased against reporting "no". This is particularly true for Mexican-born participants, of whom an estimated 93% of those without green cards are unauthorized.[17] In our sample, however, roughly a quarter of all Mexican-born participants willingly reported that they were a non-citizen without a green card.

The sensitivity of survey questions such as legal and immigration status is largely shaped by the broader context, such as domestic policy related to deportation and treatment of immigrant populations. Evidence suggests that in California, recent fears in the immigrant population created by national events has signaled itself in several indirect ways, including declines in crime reporting in immigrant neighborhoods,[18] and withdrawals from food stamps[19] and public insurance.[20] Because data for this study was collected prior to President Trump's administration, it remains to be seen how CHIS participants will respond to questions regarding citizenship and immigration status moving forward.

The current declines in reporting and withdrawal from public programs emphasizes concerns regarding threat of disclosure of immigration status in California, home to over 10 million immigrants. Beyond the institutional commitment to never share immigration data with

any other agency, CHIS participants are protected under the California Information Practices Act (section 1798.24) which prohibits the release of personal information, as well as a Certificate of from the Department of Health and Human Services which further protects CHIS from being forced to disclose identifying information by a "court subpoena, in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings."[21] Ultimately, however, it is the perception of threat which drives data quality.

There are important limitations to consider in regard to these results. First, immigration status and legal status are separate; there are authorized immigration statuses other than a green card. For participants with these immigration statuses, answering that they are not a permanent resident with a green card cannot be interpreted as lacking legal status. Second, this paper focuses on CHIS participants and their decision to respond to particular questions; however, the decision to participate in the survey at all may also be affected by immigration or legal status. This type of behavior is part of unit-nonresponse, in which the sampled unit does not participate in the survey either because they were never reached or because they refused to participate.[6] Whether unit-nonresponse differs by immigration status and to the extent that survey weights adequately correct for it is unknown. For this reason, I present the majority of my findings as unweighted characterizations of survey participants themselves; the use of survey weights did not substantively change results and were only presented sparingly as sensitivity analyses.

**Conclusion**

Public health requires meaningful data to monitor the health of different populations and inform the causes of persistent differences and disparities in health.[22] Immigration and legal status are important social determinants of health, but their presumed sensitivity have kept relevant questions off of nearly every survey positioned to address population health. By

including questions on citizenship and immigrant status in population health surveys, that abide to the appropriate confidentiality requirements, we can better inform the specific health needs of a vulnerable population. The overall low levels of citizenship and immigrant status non-response in CHIS found from 2001-2015 suggests implementation of such questions is feasible.

**Tables and Figures**

**Table 2.1 Nonresponse and Responses by Country of Birth, 2001-2015**

| | Unstratified | Mexico | Central America | China | Philippines |
|---|---|---|---|---|---|
| | *Are you a citizen of the United States?* | | | | |
| **Asked** | 81,598 | 30,120 | 5,535 | 4,638 | 3,855 |
| **Did not respond** | 1,011 (1.24%) | 718 (2.38%) | 74 (1.34%) | 23 (0.50%) | 11 (0.29%) |
| **Responded** | 80,587 | 29,402 | 5,461 | 4,615 | 3,844 |
| Yes | 46,575 (57.79%) | 10,920 (37.14%) | 2,544 (46.58%) | 3,317 (71.87%) | 2,997 (77.97%) |
| No | 33,472 (41.54%) | 18,256 (62.09%) | 2,859 (52.35%) | 1,272 (27.56%) | 806 (20.97%) |
| Pending | 540 (0.67%) | 226 (0.77%) | 58 (1.06%) | 26 (0.56%) | 41 (1.07%) |
| | ***Are you a permanent resident with a green card?*** | | | | |
| **Asked** | 35,023 | 19,200 | 2,991 | 1,321 | 858 |
| **Did not respond** | 1,274 (3.64%) | 963 (5.02%) | 92 (3.08%) | 16 (1.21%) | 13 (1.52%) |
| **Responded** | 33,749 | 18,237 | 2,899 | 1,305 | 845 |
| Yes | 21,050 (62.37%) | 9,757 (53.50%) | 1,593 (54.95%) | 989 (75.79%) | 726 (85.92%) |
| No | 11,770 (34.88%) | 8,019 (43.97%) | 1,212 (41.81%) | 252 (19.31%) | 97 (11.48%) |
| Pending | 929 (2.75%) | 461 (2.53%) | 94 (4.90%) | 64 (4.90%) | 22 (2.60%) |

**Table 2.2 Multivariate Associations of Nonresponse to Questions of Citizenship and Immigration Status**

| | *Citizenship* | | | | *LPR status* | | | |
|---|---|---|---|---|---|---|---|---|
| | Unstratified (n=81,420) | | Mexico (n=30,092) | | Unstratified (n=34,936) | | Mexico (n=19,181) | |
| **Sex** | | | | | | | | |
| Male | 1.01 | | 0.95 | | 0.92 | | 0.89 | |
| Female | Ref | | Ref | | Ref | | Ref | |
| **Age** | | | | | | | | |
| 18-29 | 2.96 | *** | 3.24 | *** | 2.61 | *** | 2.51 | *** |
| 30-39 | 3.15 | *** | 3.27 | *** | 2.65 | *** | 2.64 | *** |
| 40-49 | 1.85 | *** | 1.96 | *** | 1.99 | *** | 2.18 | *** |
| 50-64 | Ref | | Ref | | Ref | | Ref | |
| 65+ | 0.49 | *** | 0.24 | *** | 0.88 | | 0.51 | * |
| **Household poverty** | | | | | | | | |
| 0-99%FPL | 2.01 | *** | 1.76 | ** | 1.33 | * | 1.27 | |
| 100-199%FPL | 1.52 | ** | 1.3 | | 1.29 | * | 1.21 | |
| 200-299%FPL | 1.17 | | 0.97 | | 1.08 | | 0.93 | |
| 300%FPL+ | Ref | | Ref | | Ref | | Ref | |
| **Education** | | | | | | | | |
| Less than High School | 0.83 | * | 0.79 | * | 0.76 | *** | 0.79 | ** |
| High School or GED | Ref | | Ref | | Ref | | Ref | |
| Some college or more | 0.96 | | 0.86 | | 1.04 | | 0.91 | |
| **Language of interview** | | | | | | | | |
| Spanish | 3.07 | *** | 2.52 | *** | 2.07 | *** | 1.68 | *** |
| Asian language | 0.63 | * | N/A | | 0.52 | ** | N/A | |
| English | Ref | | Ref | | Ref | | Ref | |
| **English skill** | | | | | | | | |
| Not well or at all | 0.98 | | 1.01 | | 1.06 | | 0.95 | |
| Speaks English only or well | Ref | | Ref | | Ref | | Ref | |
| **Years in the US** | | | | | | | | |
| 1-5yrs | 1.13 | | 1.01 | | 0.71 | *** | 0.91 | |
| 6-10yrs | 1.34 | *** | 1.26 | * | 0.99 | | 1.1 | |
| 11+yrs | Ref | | Ref | | Ref | | Ref | |
| **CHIS cycle** | | | | | | | | |
| 2001 | Ref | | Ref | | Ref | | Ref | |
| 2003 | 1.53 | ** | 1.39 | * | 1.35 | * | 1.13 | |
| 2005 | 1.11 | | 1.09 | | 1.09 | | 0.96 | |
| 2007 | 2.22 | *** | 2.3 | *** | 3.18 | *** | 3.11 | *** |
| 2009 | 2.41 | *** | 2.53 | *** | 3.39 | *** | 3.41 | *** |
| 2011/12 | 2.65 | *** | 2.94 | *** | 3.68 | *** | 3.82 | *** |
| 2013/14 | 1.84 | *** | 1.93 | *** | 2.86 | *** | 2.83 | *** |
| 2015 | 2.64 | *** | 2.93 | *** | 3.16 | *** | 3.05 | *** |
| **Country of birth** | | | | | | | | |
| Mexico | 1.46 | *** | N/A | | 1.51 | *** | N/A | |
| All else | Ref | | | | Ref | | | |

**Figure 2.1 Responses to questions of country of birth, citizenship and immigration status**

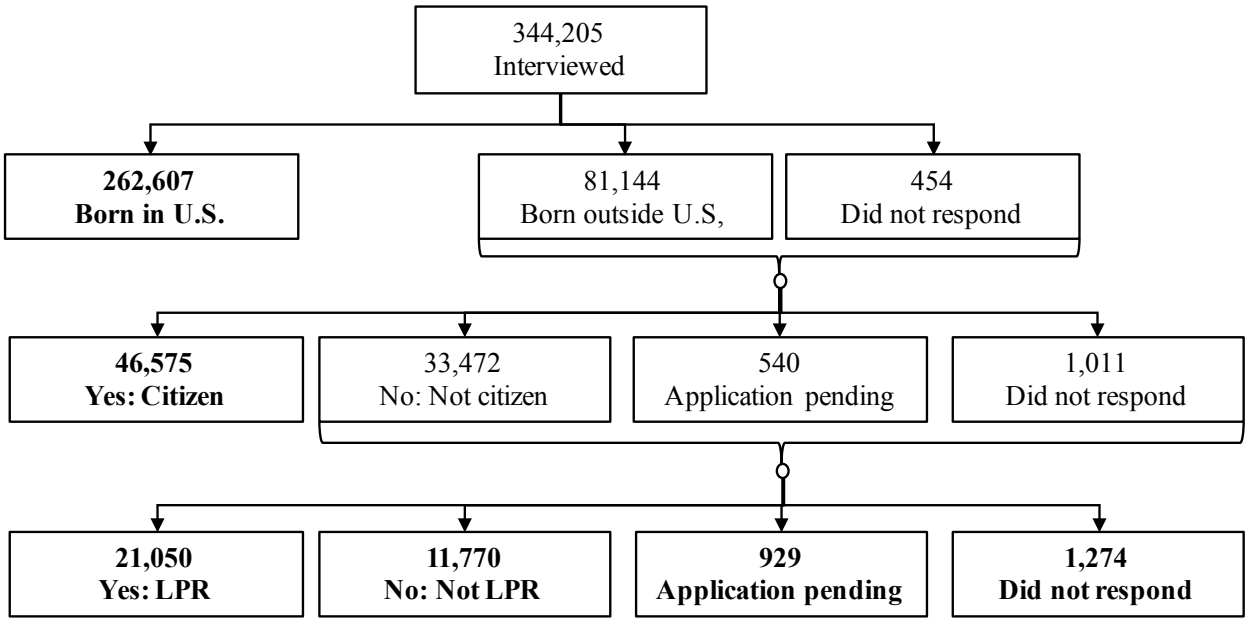
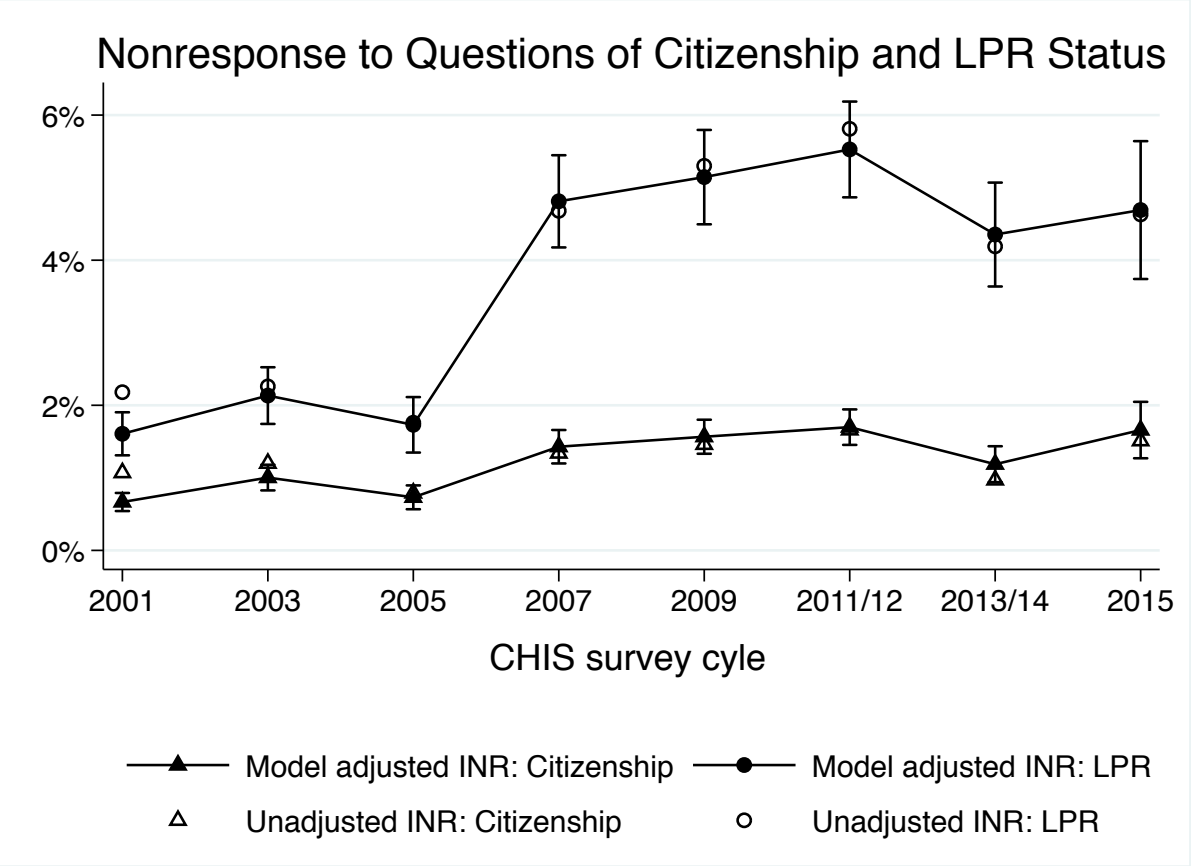


**Figure 2.2 Nonresponse to Questions of Citizenship and LPR Status**



## References


1. Clark RL, King RB. Social and economic aspects of immigration. *Ann N Y Acad Sci*. 2008;1136:289-297. doi:10.1196/annals.1425.021
2. U.S. Government Accountability Office. *Estimating the Undocumented Population: A Grouped Answers Approach to Surveying Foreign-Born Respondents*. Washington, D.C.: U.S. GAO; 2006. http://www.gao.gov/products/GAO-06-775. Accessed June 29, 2015.
3. Bachmeier JD, Van Hook J, Bean FD. Can We Measure Immigrants' Legal Status? Lessons from Two U.S. Surveys. *Int Migr Rev*. 2014;48(2):538-566. doi:10.1111/imre.12059
4. National Academies of Sciences E. *The Integration of Immigrants into American Society*.; 2015. doi:10.17226/21746
5. Tourangeau R, Yan T. Sensitive questions in surveys. *Psychol Bull*. 2007;133(5):859-883. doi:10.1037/0033-2909.133.5.859
6. Groves RM, Jr FJF, Couper MP, Lepkowski JM, Singer E, Tourangeau R. *Survey Methodology*. John Wiley & Sons; 2011.
7. Baker B, Rytina N. *Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2012*. Department of Homeland Security, Office of Immigration Statistics; 2013. https://www.dhs.gov/sites/default/files/publications/Unauthorized%20Immigrant%20Population%20Estimates%20in%20the%20US%20January%202012_0.pdf.
8. Street 1615 L., NW, Washington S 800, Inquiries D 20036 202 419 4300 | M 202 419 4349 | F 202 419 4372 | M. U.S. unauthorized immigration population estimates. *Pew Res Cent Hisp Trends Proj*. November 2016. http://www.pewhispanic.org/interactives/unauthorized-immigrants/. Accessed July 4, 2017.
9. Immigrants in California. *PPIC*. http://www.ppic.org/publication/immigrants-in-california/. Accessed July 21, 2017.
10. *2015 Weighting and Variance Estimation*. Los Angeles, CA: UCLA Center for Health Policy Research http://healthpolicy.ucla.edu/chis/design/Documents/chis-2015-short-methodology-report-5_weighting_2016-12-13.pdf.
11. StataCorp. *Stata Statistical Software: Release 14*. College Station, Texas: Stata Corp LP; 2015.
12. Van Hook J, Bachmeier JD. How Well Does the American Community Survey Count Naturalized Citizens? *Demogr Res*. 2013;29(1):1-32. doi:10.4054/DemRes.2013.29.1
13. Vargas JA. My Life as an Undocumented Immigrant. *The New York Times*. http://www.nytimes.com/2011/06/26/magazine/my-life-as-an-undocumented-immigrant.html. Published June 22, 2011. Accessed January 26, 2017.
14. Chang C. California voters more tolerant of illegal immigrants, poll finds. *Los Angeles Times*. http://articles.latimes.com/2012/oct/28/local/la-me-poll-immigration-20121028. Published October 28, 2012. Accessed January 9, 2017.
15. Gramlich J, comments KB. Immigration offenses make up a growing share of federal arrests. *Pew Res Cent*. April 2017. http://www.pewresearch.org/fact-tank/2017/04/10/immigration-offenses-make-up-a-growing-share-of-federal-arrests/. Accessed July 19, 2017.
16. Census Bureau. Item Allocation Rates: American Community Survey. https://www.census.gov/acs/www/methodology/sample-size-and-data-quality/item-allocation-rates/. Accessed July 19, 2017.

17. Passel JS. *Percent of "Non–Green Card" Aliens Who Are Undocumented Immigrants, for Most Recent Period of Entry to the US, Based on Urban Institute Estimates Derived From March Current Population Surveys of 1999-2001: Custom Data Table*. Washington, DC: Urban Institue; 2002.
18. Latinos are reporting fewer sexual assaults amid a climate of fear in immigrant communities, LAPD says - LA Times. http://www.latimes.com/local/lanow/la-me-ln-immigrant-crime-reporting-drops-20170321-story.html. Accessed July 4, 2017.
19. Duggan T. Immigrants' fear cited in declining food stamp use in SF. *San Francisco Chronicle*. http://www.sfchronicle.com/food/article/Fewer-eligible-San-Franciscans-taking-advantage-11151203.php. Published May 16, 2017. Accessed July 4, 2017.
20. Trump's Immigration Policy Causing Some To Withdraw Kids From Medi-Cal | California Healthline. http://californiahealthline.org/morning-breakout/trumps-immigration-policy-causing-some-to-withdraw-kids-from-medi-cal/. Accessed July 4, 2017.
21. Survey Respondent Information | UCLA Center for Health Policy Research. http://healthpolicy.ucla.edu/chis/respondents/Pages/confidentiality.aspx. Accessed September 1, 2017.
22. Galea S, Vaughan RD. A Public Health of Consequence: Review of the August 2017 Issue of AJPH. *Am J Public Health*. 2017;107(8):1209-1210. doi:10.2105/AJPH.2017.303920

## Chapter 3: When they answer, should we listen? Examining the quality of self-reported citizenship and immigration status

### Introduction

Immigration status is an important social determinant of health[1,2] which typically goes unmeasured in population health surveys.[3] In large part, this is due to an assumption that immigration status is too sensitive to ask.[2,4] Sensitive questions involve dimensions of intrusiveness, social undesirability, or threat of disclosure[5] and produce poor quality data to the extent that survey participants choose to not answer (nonresponse) or falsify their answer (misreport).[6] However, the sensitivity of a question seems not to be inherent to the topic itself, but shaped by the context in which it is asked.[7] It remains an open question as to what extent questions of immigration status in population surveys would be met with nonresponse or misreporting, and we have had few opportunities to evaluate whether these concerns are justified.

While nonresponse is a preliminary indicator of sensitivity due to its ease of measurement, misreporting may be a more serious threat to data quality.[8] To my knowledge, two studies have evaluated misreporting of citizenship or immigration status in population surveys. Van Hook and Bachmeier found that self-reported naturalized citizenship in the 2010 American Community Survey overestimates naturalized citizenship per administrative records for Mexican immigrants (between 25% and 38%) and for all immigrants with fewer than five years of US residency (between 208% for Asian women and 2,587% for Mexican men).[9] Shortly thereafter, Bachmeier, Van Hook and Bean found that self-reported citizenship and immigration data from the Los Angeles Family Neighborhood Survey and the Survey of Income and Program Participation produced profiles of the unauthorized population which were consistent with external estimates, indicating that unauthorized participants did not misreport themselves as

being an authorized status.[10] However, as the authors note, these data were collected between 2001 and 2004, prior to widespread increases in immigration enforcement which may have made immigration status more sensitive and prone to nonreseponse and misreporting.

In this paper, I examine the proportion and characteristics of Mexican-born participants of the California Health Interview Survey (CHIS) who reported being a non-citizen without a green card (non-LPR) and characterizing the extent to which unauthorized individuals may have misreported themselves as being a naturalized citizen or a permanent resident with a green card (LPR) from 2003 to 2015. This study builds on previous research which reported that that nonresponse to citizenship and immigration status questions in CHIS are low overall, however are largely attributable to Mexican-born participants and also increased over time.[11]

I use two perspectives to characterize the quality of self-reported immigration status. First, I focus on participants who report being a non-citizen without a green card (non-LPR). An estimated 93%[12] to 98%[13] of Mexican non-citizen non-green card holders are unauthorized (as opposed to other statuses such as refugees), making non-LPR an appropriate proxy for unauthorized status. I examine the proportion of Mexican-born participants who report being non-LPR, and develop a demographic profile based on the characteristics of these respondents. A rule of thumb in surveying sensitive topics is that "more is better";[6] a small proportion of participants reporting that they are non-LPR could be interpreted as a sign that unauthorized people misreported themselves to be a citizen or an LPR. In addition, a demographic profile produced by self-report which is inconsistent with external estimates may also be a sign that unauthorized individuals misreported their status.[10]

Second, I focus on those who reported that they were a naturalized citizen or a permanent resident with a green card (LPR) and assess the likelihood that they were an unauthorized person

who had misreported their status. To do so, I borrow strategies developed by social scientists to assign legal status to individuals in population surveys which do not ask questions beyond naturalized citizenship. These strategies have been used by a number of immigration and demography research centers to meet the needs for individual-level data regarding the unauthorized population.[14–17] There are variations in how centers execute this strategy, however they each follow a two-step process.

First, foreign-born participants to a population survey are screened for characteristics which would makes it highly unlikely that they are unauthorized. These "logic edits" are intended to set aside people who are not unauthorized to make the final selection process more accurate. Examples of logic edits include characteristics which would require a legal status, such as receiving public benefits, or are related to immigration history, such as being eligible for the Immigration Reform Control Act of 1986. Second, a subset of individuals who were not already identified by logic edits are classified as being unauthorized, either by variations of random or probabilistic assignment. Those who use probabilistic methods use SIPP to develop a statistical profile of the unauthorized population to inform the selection process of unauthorized participants in the new dataset. A comparison of referenced logic-edits and selection procedures is available in the technical appendix.

Rather than this two-step strategy being used to assign an unauthorized status, I use it to explore misreporting in CHIS by corroborating some responses and characterizing the rest. First, logic-edits can corroborate self-reported citizens or LPRs as being authorized. For participants whose self-report is not corroborated by logic-edits, predicted probabilities could characterize how similar they are to participants who reported being non-LPR.

These strategies may be particularly well-suited for identifying changes over time. If unauthorized participants increasingly misreported themselves as being a citizen or an LPR over time, I expect the proportion of self-reported citizens/LPRs that are corroborated by logic edits would decrease, and the distribution of predicted probabilities of unauthorized status to shift higher.

CHIS has consistently asked questions sufficient to perform logic edits and calculate predicted probabilities since 2003. In addition to presenting self-reported citizenship/immigration status and profiling the self-reported non-LPRs, I replicate this indirect strategy in sequential CHIS panels to address three primary questions:

1. What proportion of self-reported citizens and LPRs in CHIS can be corroborated as "authorized" (i.e., not-unauthorized) by logic edits?
2. Among those who are not yet corroborated, do predicted probabilities of being unauthorized suggest significant amounts of misreporting?
3. Is there evidence that data quality as measured by these indicators has changed over time?

## Methods

CHIS is a multistage dual-frame random-digit-dial (RDD) telephone survey which is designed to produce state- and county-level estimates of health indicators for Californians. Participants who report being born outside of the U.S., as well as participants who do not respond, are eligible for the immigration module, which reads:

**The next questions are about citizenship and immigration.**
**Are you a citizen of the United States?**
*- if did NOT answer "YES"-*
**Are you a permanent resident with a green card?**
**Your answers are confidential and will not be reported to Immigration Services.**

I limit the analysis to respondents who reported that they were born in Mexico; participants who did not answer their country of birth and were later imputed to be Mexican-born were excluded. I classify non-citizen non-LPR Mexican-born immigrants to be unauthorized. I

classify individuals who are identified by logics edits to be authorized. Participants who reported that they were a naturalized citizen or an LPR who were subsequently classified as authorized are described as "corroborated". The logic edits in this analysis are intentionally conservative to minimize type 1 error (false-positive) in this step; those who are not corroborated in the first step are considered "unassigned" and characterized in the second step using predicted probabilities.

Profile of the unauthorized population

The self-reported citizenship or immigration status, including "ambiguous" status due to nonresponse, are presented as a proportion of the Mexican-born population for each survey cycle. A detailed demographic profile of the unauthorized Mexican-born population, based solely on self-reported non-LPR status, is also presented for each survey cycle. Given the intent to describe the unauthorized population of Californians of Mexican origin, I use Taylor series survey weights to accommodate the complex survey design of CHIS, and present weighted estimates.

Logic edits of authorized status

Authorized status was assigned to CHIS participants who reported having immigrated to the United States prior to 1982 (due to amnesty granted through the the Immigration Reform and Control Act), who were at least 60 years old at the time of immigration (fewer than 5% of the unauthorized population is 55 or older according to residual estimates), or who work for the government, have health insurance through Medicare, Veterans Affairs Care, or Indian Health Services, or report receiving SSI (all of which require proof of lawful status).

Conservatively, I do not include self-reported naturalized citizenship as a logic edit given published accounts of misreporting naturalized citizenship in the American Community Survey.[9] In addition, I do not include Medicaid (Medi-Cal) as a logic edit as emergency Medi-Cal is

available to unauthorized persons in California.[18] Lastly, I do not include SNAP or TANF benefits as a logic edit for households with children, as lawfully present children could be the eligible recipient in mixed status families. With the exception of TANF, these specifications have been incorporated by at least one other cited methodology report. It is possible to exclude TANF in CHIS as this program is asked about specifically, but cannot be disaggregated in the ACS as it is combined in a bundled "welfare payments" question.[19]

Predicted probabilities of unauthorized status

Predicted probabilities of being unauthorized were estimated using logistic regression models for CHIS participants who were not classified as authorized in the previous step. The independent variable was a binary indicator of self-reported non-LPR (i.e. unauthorized) status. Covariates included sex, age, education, household size, income-to-poverty ratio, employment status, home ownership, health insurance status, years of US residency, spoken English proficiency, and whether only English is spoken at home. This specification is based on previous probabilistic classification models (Appendix 3.1). Models and predicted probabilities were generated from cycle specific models, as well as a pooled model which also included a variable for survey cycle. As these steps are reflective of survey participants and not population estimates, survey weights are not used. All analyses were conducted using Stata 14.[20]

**Results**

Between 2003 and 2015, a total of 24,783 CHIS participants reported they were born in Mexico. Of these participants, 9,172 reported that they were a naturalized citizen and 7,876 reported that they were an LPR with a green card, resulting in 17,048 (68.8%) responses to corroborate. In addition, 6,538 reported that they were not an LPR and 334 reported that their

green card status was pending. These 6,872 participants were combined and considered "unauthorized" (27.7%). Lastly, 863 (3.5%) participants did not respond to the LPR question.

Table 3.1 reports the weighted proportion of each immigration status category over time. Self-reported non-LPR consistently decreased from 38% in 2003 to 30% in 2013/14, then increased to 34% in 2015. This was matched by increasing self-reported citizenship, rising from 26% in 2003 to 36% in 2013/14, then decreasing slightly to 35% in 2015. In contrast, self-reported LPR status remained relatively consistent across the study period. The 2007 survey cycle, previously identified as having the largest increase in nonresponse to LPR status, also experienced the greatest reduction in reporting non-LPR status. The seven-percentage point decrease from the previous cycle was offset by a three-percentage point increase in nonresponse and a four-percentage point increase in self-reported citizenship.

The weighted profile of the unauthorized population (Table 3.2) identified several compositional shifts over time. For example, 46% of the 2003 cycle was under the age of 30, whereas 14% was in 2015. Unemployment started at 10% in 2003, peaked at 12% in 2009, then fell again to 6% by 2015. The length of U.S. residence also steadily increased over time, with a median of 8 years in 2003 to 15 years by 2015. However, other characteristics were more consistent over time. In every cycle, the plurality of self-reported non-LPR had less than a high school education (pooled: 68%), lived under the federal poverty line (pooled: 55%), had limited English proficiency (pooled: 85%) and lived in a Spanish-only speaking household (pooled: 62%). They were also consistently married (48%) and residing with children under the age of 18 (64%).

Logic edits

The logic edits identified a total of 9,879 participants as being "authorized", corroborating 69.9% of self-reported naturalized citizens and 37.7% of self-reported LPRs. In addition, 9.3% of participants with an ambiguous status and 6.2% of self-reported non-LPR (i.e. unauthorized) were also identified by logic edits as likely "authorized." Participants who were identified as authorized by logic edits but reported being non-LPR were still considered to be unauthorized.

Results of the logic edit step for each cycle are presented in Table 3.3. The proportion of Mexican-born participants who were corroborated by logic edits remained within three percentage points of the average across the study period. While the proportion of those self-reporting as citizens who were corroborated by logic edits consistently fell from 74.5% in 2003 to 66.2% in 2015, The proportion of self-reported LPR who were corroborated as "authorized" did not follow this trend and remained within four percentage points across the study period. The most impactful logic edit in our sample was immigrating prior to 1982. Table 3.3 fully describes the results of the logic edit process over time.

Predicted probabilities

For unassigned participants who were not corroborated by logic edits, the median predicted probability of unauthorized status from the pooled model was 0.30 (IQR: 0.15;0.51). This ranged from 0.19 (IQR: 0.09;0.34) among participants who reported they were a naturalized citizen, 0.35 (IQR: 0.19;0.53) among participants who reported they were LPR, and 0.54 (IQR: 0.36;0.69) among participants who did not answer the LPR question. The differences in probabilities observed between self-reported citizens and LPR and differences between self-reported LPR and those who did not answer were both statistically significant. Visualizing the

distributions of probabilities for each cycle did not indicate an appreciable change across time (Figure 3.1).

**Discussion**

Contrary to long-held assumptions about the sensitivity of immigration status, I do not find evidence that there has been extensive misreporting of citizenship or immigration status among Mexican-born participants in the California Health Interview Survey, or that misreporting had become more common over time. These results align with previous research regarding self-reported immigration status in the L.A.FANS and SIPP, demonstrating that population surveys have the capacity to produce data regarding the unauthorized population and their families.

A third of participants who reported being born in Mexico also reported being non-LPR. This figure declined ten percentage points from 38% the 2003 cycle to 28% in the 2011/12 cycle. This is partly attributable to a four-percentage point increase in nonresponse during the same period, but may also reflect decreases in the unauthorized population in California.[21] Similarly, increases in self-reported naturalized citizenship could reflect substantial growth in naturalization that occurred between 2006 and 2008.[22] While these explanations are speculative, the primary finding that at least a quarter of Mexican-born participants reported being non-LPR in every cycle examined is robust.

These profiles of the unauthorized population as measured in CHIS is largely consistent with external estimates. In addition to the detailed profile presented in Table 3.2, I compare profiles of the Californian unauthorized population as produced by Migration Policy Institute and the Center for Migration studies (Appendix 3.2 and 3.3). As reported by Bachmeier et al., direct comparisons with external profiles are problematic when they represent different populations. The two profiles represent unauthorized Californians of all ages and countries of origin, whereas

these CHIS data represent adults of Mexican origin. Regardless, the profiles are particularly similar regarding sex, education, unemployment, uninsurance, marital status, and years of US residence. Profiles diverge regarding poverty status, years in US and English skill. Part of these differences may be attributable to differences in populations of age and country of origin. When I expand the profile to all participants who report being a non-LPR, regardless of country of origin, years of US residency more closely aligns with external estimates, although there are still a greater number of CHIS participants living under the poverty line compared to external estimates. Additionally, the median number of years of US residency as reported by CHIS participants closely follows the trend that has previously been reported by Pew[23] (Appendix 3.4).

Logic edits and predicted probabilities provide encouraging evidence that there has not been sizeable misreporting of citizenship and LPR status. Conservative logic edits corroborated 70% of self-reported naturalized citizens and 40% of self-reported LPRs. Averaged across all years, logic edits corroborated 22.2% of the non-citizen sample, which is comparable to previously reported results of logic edits among Mexican-born participants in the ACS.[16,17] For the unclassified participants who required further corroboration, probabilities of being unauthorized (i.e. misreported) are low and do not appear to have changed appreciably over time.

There are a number of limitations to consider in the interpretation of these results. First, this analysis is positioned to characterize the extent to which unauthorized individuals misreported themselves to be either a citizen or an LPR; it does not address LPR individuals who may have misreported themselves to be citizens. In addition, the characterization of Mexican-born participants who do not have a green card as unauthorized conflates immigration and legal status; however, for the Mexican-born population this assumption is justified in the literature. This specification error is greater for unauthorized individuals who are not Latino. Using

national figures from Pew Research Center, I estimate that roughly 60% of non-citizen non-LPR individuals who are not Latino are unauthorized. Future research should work towards identifying best practices for measuring unauthorized status for this growing population. Lastly, these results are inherently descriptive as I can never be completely certain in classifying a response as valid or misreported.

With these limitations in mind, these results still indicate that a direct question regarding immigration status in an ongoing population survey has performed well. This finding, along with previous evaluations of L.A.FANS and SIPP data,[10] demonstrate that surveys can produce valuable data on immigration status and the unauthorized population contrary to common preconception. A large part of this value comes from the fact that self-report produces individual-level data, which can be used in analyses where aggregate estimates cannot. Without self-report, individual-level data have been imputed using various strategies, although the accuracy of these imputations methods are rarely tested.

In a thorough review of the most common imputation strategies, Van Hook and colleagues concluded that "it is not possible to spin straw into gold";[24] simulation models demonstrated that imputation models can easily produce biased estimates of the unauthorized population, and successful imputation requires strict adherence to model specifications. Specifically, variables used in imputation models need to be measured in both the donor data which measures legal status and the target data for which legal status will be imputed to produce unbiased estimates. This requirement likely limits the ability of even the performing imputation methods to impute legal status in various data sets.

This study and previous work on non-response has focused on response behavior, however an equally important question is whether we should ask these questions at all.[25]

Immigration status has and will continue to be an important social determinant of health, and its measurement is important for public health research. Using this data outside of its intended purpose is unethical and researchers need to take appropriate steps to protect the rights and confidentiality of their research subjects. CHIS participants are protected with a rigorous research protocol approved by the California Committee for the Protection of Human Subjects, the UCLA Institutional Review Board, and the federal Office of Management and Budget. Additionally, CHIS has acquired a Certificate of Confidentiality from the National Institutes of Health to further protect CHIS participants from legally forced data disclosure. While the obligation to protect participant confidentiality falls on researchers, the decision as to how to respond is a choice made by respondents. The social and political context shape how this decision is made. Notably, these data do not include responses collected after 2015, a period of intense anti-immigrant rhetoric and heightened threats to non-citizens. Future research will continue to evaluate response behavior to these questions in CHIS and monitor potential changes from the baseline I have established here.

**Conclusion**

Immigration status is a social determinant of health which have largely gone unmeasured.[3] These results indicate that over a decade's worth of self-reported citizenship and immigration status collected in the California Health Interview Survey is fit for use. Population surveys can contribute to applied research for non-citizen subgroups, and this research offers a new strategy to study misreporting using indirect methods. These methods can inform quality assessments of other contemporary surveys, such as the National Latino Health Interview Survey, and these results should be considered in planning future surveys. Rather than anticipated misreporting being a non-starter to applied research on immigrant populations, we

can reframe analyses to be sensitive to an array of potential scenarios of misreporting, and present results accordingly.

## Tables, Figures and Appendices

**Table 3.1 Self-reported Citizenship and Immigration Status Over Time (Weighted %)**

| | 2003 | 2005 | 2007 | 2009 | 2011 | 2013 | 2015 |
|---|---|---|---|---|---|---|---|
| Citizen | 26.4 | 28.4 | 32.4 | 36.2 | 35.9 | 36.2 | 34.6 |
| LPR | 33.3 | 31.9 | 32.2 | 31.0 | 29.9 | 30.4 | 27.8 |
| Non-LPR | 38.2 | 37.7 | 30.6 | 28.7 | 28.2 | 30.1 | 33.5 |
| Ambiguous | 2.01 | 1.94 | 4.87 | 4.16 | 6.06 | 3.21 | 4.15 |
| | *Percentage-point change relative to previous cycle* | | | | | | |
| Citizen | N/A | 2 | 4 | 3.8 | -0.3 | 0.3 | -1.6 |
| LPR | N/A | -1.4 | 0.3 | -1.2 | -1.1 | 0.5 | -2.6 |
| Non-LPR | N/A | -0.5 | -7.1 | -1.9 | -0.5 | 1.9 | 3.4 |
| Ambiguous | N/A | -0.07 | 2.93 | -0.71 | 1.9 | -2.85 | 0.94 |

Source: California Health Interview Survey 2003-2015, Mexican-origin adults

| | 2003 | 2005 | 2007 | 2009 | 2011-12 | 2013-14 | 2015 | 2003-15 |
|---|---|---|---|---|---|---|---|---|
| **Sex** | | | | | | | | |
| Male | 53.84 | 58.98 | 52.87 | 48.05 | 48.81 | 51.45 | 48.52 | 51.96 |
| **Age** | | | | | | | | |
| 18-29 | 45.73 | 42.81 | 31.85 | 31.76 | 23.64 | 17.46 | 14.18 | 29.95 |
| 30-39 | 38.41 | 39.36 | 43.14 | 43.28 | 40.38 | 40.59 | 39.74 | 40.54 |
| 40-49 | 11.39 | 12.96 | 19.48 | 18.60 | 27.98 | 31.23 | 31.82 | 21.71 |
| 50-64 | 3.91 | 4.13 | 5.13 | 5.88 | 7.61 | 10.29 | 12.58 | 7.1 |
| 65+ | 0.57 | 0.75 | 0.40 | 0.48 | 0.40 | 0.44 | 1.68 | 0.7 |
| Median | 30 | 31 | 34 | 34 | 36 | 38 | 39 | 34 |
| (IQR) | (26-36) | (26-36) | (28-40) | (28-39) | (30-42) | (32-43) | (33-45) | (28-41) |
| **Education** | | | | | | | | |
| Less than HS | 76.35 | 71.02 | 65.86 | 60.38 | 62.15 | 65.33 | 70.87 | 67.97 |
| High School/GED | 16.78 | 19.26 | 24.67 | 28.86 | 22.59 | 24.61 | 19.43 | 21.95 |
| At least some college | 6.87 | 9.72 | 9.48 | 10.76 | 15.27 | 10.06 | 9.70 | 10.08 |
| **Marital status** | | | | | | | | |
| Married | 46.21 | 48.86 | 50.32 | 50.98 | 43.96 | 49.67 | 44.82 | 47.73 |
| Other | 25.03 | 28.43 | 30.35 | 27.92 | 38.01 | 30.18 | 33.38 | 30.27 |
| Never married | 28.76 | 22.70 | 19.34 | 21.1 | 18.03 | 20.15 | 21.80 | 21.99 |
| **Children in home** | | | | | | | | |
| No | 36.67 | 33.78 | 35.94 | 32.66 | 30.17 | 36.05 | 42.57 | 35.68 |
| Yes | 63.33 | 66.22 | 64.07 | 67.34 | 69.83 | 63.95 | 57.43 | 64.32 |
| **HH Poverty** | | | | | | | | |
| 0-99%FPL | 55.87 | 53.83 | 56.26 | 64.54 | 55.79 | 46.04 | 52.33 | 54.76 |
| 100-199%FPL | 34.49 | 36.14 | 30.72 | 23.75 | 31.63 | 42.62 | 33.16 | 33.47 |
| 200-299%FPL | 6.86 | 5.28 | 9.07 | 7.19 | 6.47 | 8.12 | 9.05 | 7.42 |
| 300%FPL+ | 2.78 | 4.74 | 3.95 | 4.52 | 6.11 | 3.22 | 5.46 | 4.36 |
| **Own home** | | | | | | | | |
| Yes | 12.29 | 15.29 | 15.06 | 13.29 | 14.31 | 17.33 | 13.50 | 14.38 |
| **Currently Insured** | | | | | | | | |
| Yes | 41.24 | 41.62 | 42.07 | 47.68 | 47.60 | 42.82 | 54.33 | 45.35 |
| **Unemployed** | | | | | | | | |
| Yes | 9.59 | 2.89 | 6.04 | 12.14 | 10.52 | 6.74 | 5.87 | 7.55 |
| **English Skill** | | | | | | | | |
| English Only to Well | 12.84 | 12.10 | 14.71 | 17.13 | 17.38 | 14.19 | 19.44 | 15.33 |
| Not well or at all | 87.16 | 87.90 | 85.29 | 82.87 | 82.62 | 85.81 | 80.56 | 84.67 |
| **Spanish home only** | | | | | | | | |
| Yes | 62.88 | 63.66 | 59.40 | 61.03 | 60.89 | 55.39 | 65.54 | 61.46 |
| **Years in US** | | | | | | | | |
| 1-5yrs | 32.50 | 33.70 | 26.37 | 17.46 | 9.37 | 4.93 | 6.67 | 19.09 |
| 6-10yrs | 31.72 | 28.14 | 29.38 | 34.77 | 27.08 | 24.84 | 16.23 | 27.22 |
| 11+yrs | 35.78 | 38.16 | 44.25 | 47.77 | 63.55 | 70.22 | 77.1 | 53.69 |
| Median | 8 | 8 | 10 | 10 | 12 | 14 | 15 | 11 |
| (IQR) | (4-13) | (5-14) | (5-15) | (7-15) | (10-19) | (10-20) | (11-20) | (7-16) |

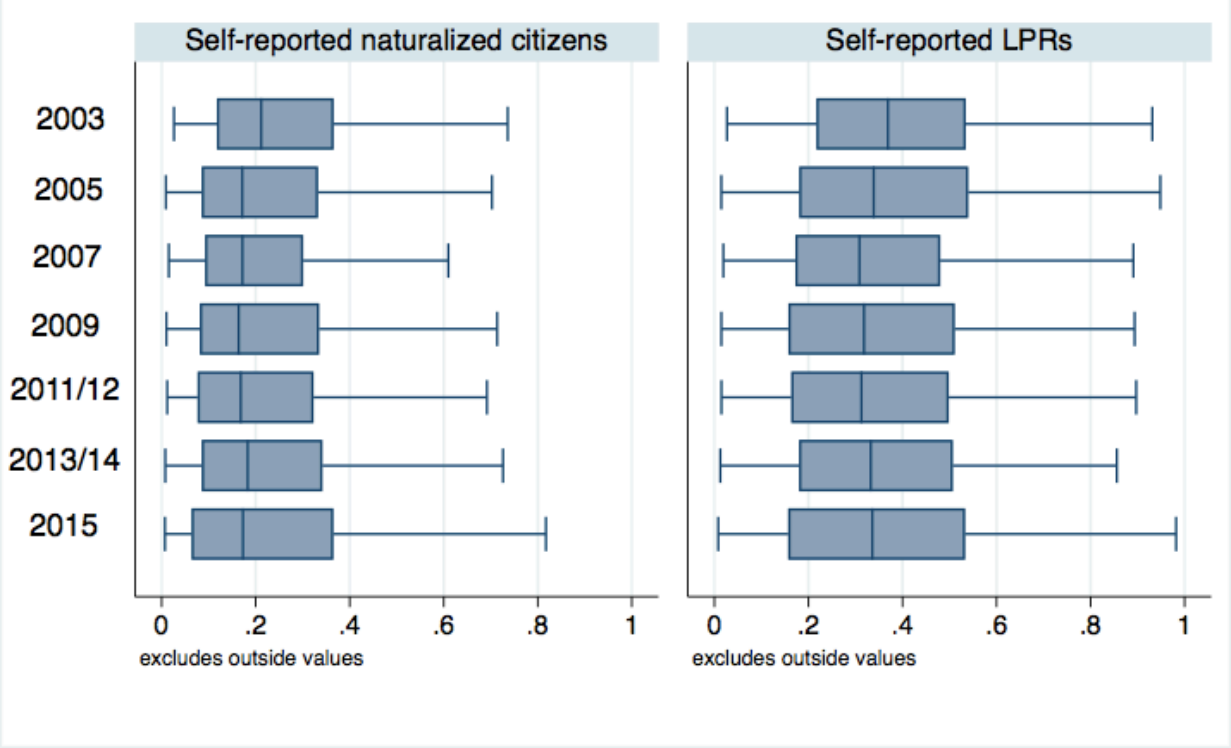
Source: California Health Interview Survey 2003-2015, Mexican-origin adults

**Table 3.3 Results of the Logic-Edit Procedure (Unweighted %)**

| | 2003 | 2005 | 2007 | 2009 | 2011/12 | 2013/14 | 2015 | 2003-15 |
|---|---|---|---|---|---|---|---|---|
| **Mexican-born (n)** | 3,923 | 3,429 | 3,699 | 3,794 | 4,360 | 3,488 | 2,090 | 24,783 |
| **Steps** | | | | | | | | |
| IRCA | 33.16 | 31.67 | 35.41 | 31.55 | 30.92 | 32.00 | 27.13 | 31.98 |
| Medicare | 6.40 | 7.52 | 11.30 | 11.94 | 14.08 | 19.07 | 16.22 | 12.10 |
| SSI | 5.30 | 5.54 | 7.06 | 7.54 | 8.14 | 8.72 | 8.56 | 7.19 |
| Government employee | 4.44 | 6.12 | 6.84 | 5.43 | 4.79 | 5.45 | 4.59 | 5.40 |
| SNAP* | 0.84 | 1.20 | 1.22 | 2.24 | 3.12 | 3.81 | 4.59 | 2.30 |
| TANF* | 0.71 | 0.20 | 0.46 | 0.61 | 0.92 | 0.80 | 1.29 | 0.69 |
| Senior at entry | 0.61 | 0.44 | 0.57 | 0.47 | 0.53 | 0.95 | 0.96 | 0.62 |
| Military/Indian Health Insurance | 0.42 | 0.26 | 0.26 | 0.18 | 0.40 | 0.15 | ** | 0.26 |
| **Classification status** | | | | | | | | |
| "Authorized" via logic edits | 36.45 | 35.52 | 40.71 | 38.09 | 37.84 | 41.57 | 36.17 | 38.15 |
| Self-reported non-LPR | 32.93 | 33.22 | 26.17 | 26.52 | 24.89 | 21.96 | 29.47 | 27.73 |
| Unassigned | 30.61 | 31.26 | 33.12 | 35.4 | 37.27 | 36.47 | 34.35 | 34.12 |

*Households without children
** Suppressed due to small cell size
Source: California Health Interview Survey 2003-2015, Mexican-origin adults

**Figure 3.1 Predicted Probabilities of Unauthorized Status Among Uncorroborated Participants**




Source: California Health Interview Survey 2003-2015, Mexican-origin adults

**Appendix 3.1 Specification of Logic Edits and Probabilistic Models Across Centers**

| | PHC | CMS | USC | MPI | Van Hook | CHIS |
|---|---|---|---|---|---|---|
| | **Logic edits** | | | | | |
| **Naturalized citizenship** | No | Yes | Yes | Yes | Yes | No |
| **IRCA** | Pre-1980 | Pre-1982 | Pre-1982 | No | Pre-1982 | Pre-1982 |
| **Senior at entry** | No | Yes | No | No | No | Yes |
| **Occupation** | | | | | | |
| Government employee | Yes | Yes | Yes | Yes | Yes | Yes |
| Military service | Yes | Yes | Yes | Yes | Yes | No |
| Other job which requires proof of lawful status (judge, firefighter, etc) | Yes | Yes | Yes | Yes | Yes | No |
| **Insurance** | | | | | | |
| Medicare | Yes | Yes | Yes | No | No | Yes |
| Medicaid | Yes | Yes* | No | No | No | No |
| Military insurance (VA Care) | No | No | Yes | No | No | Yes |
| Indian Health Insurance | No | No | Yes | No | No | Yes |
| **Public benefits** | | | | | | |
| TANF | Yes | Yes | No | Yes | ? | Yes** |
| SSI | Yes | Yes | Yes | Yes | Yes | Yes |
| SNAP | Yes | No | Yes** | No | ? | Yes** |
| | **Multivariate Models** | | | | | |
| Gender | | | Yes | Yes | Yes | Yes |
| Age | | | Yes | Yes | Yes | Yes |
| Education | | | Yes | Yes | Yes | Yes |
| Household size | | | No | Yes | Yes | Yes |
| Income to poverty ratio | | | No | Yes | Yes | Yes |
| Labor force status | | | No | Yes | Yes | Yes |
| Occupation | | | No | No | Yes | Yes |
| Home ownership | | | No | Yes | Yes | Yes |
| Insurance coverage | | | No | Yes | Yes | Yes |
| Marital status | | | Yes | Yes | Yes | Yes |
| Spouses citizenship | | | Yes | No | Yes | No |
| Parental status | | | Yes | Yes | Yes | Yes |
| Duration of US residence | | | Yes | Yes | Yes | Yes |
| English ability | | | Yes | Yes | Yes | Yes |
| Languages at home | | | No | No | No | Yes |

**Appendix 3.2 Comparison of Demographic Profiles: MPI**

| | Migration Policy Institute (2010-2014 pooled) | CHIS (2010-2014 pooled) | |
|---|---|---|---|
| % Mexican born | 70% | 100% | 67% |
| Universe | All ages | Adults 18 years older | Adults 18 years older |
| Age* | (25+ years old) | (25+ years old) | (25+ years old) |
| 25 to 34 | 32 | 30 | 35 |
| 35 to 44 | 32 | 49 | 45 |
| 45 or older | 36 | 21 | 20 |
| Sex | | | |
| Female | 48 | 50 | 47 |
| Male | 52 | 50 | 53 |
| Education | (25+ years old) | (25+ years old) | (25+ years old) |
| Less than HS | 58 | 67 | 57 |
| HS / GED | 21 | 22 | 21 |
| Some college | 11 | 8 | 7 |
| College or more | 10 | 3 | 15 |
| | | | |
| <=100% FPL | 32 | 51 | 45 |
| Unemployed | 8 | 8 | 9 |
| Uninsured | 55 | 55 | 50 |
| Marital status | (15+ years old) | | |
| Married | 40 | 47 | 44 |
| Years in US | | | |
| Less than 5 | 13 | 5 | 14 |
| 5 to 9 | 20 | 18 | 22 |
| 10 to 14 | 23 | 31 | 28 |
| 15 to 19 | 19 | 18 | 15 |
| 20 or more | 28 | 28 | 21 |
| | | | |
| Speaks English | (5+ years old) | | |
| Exclusively | 4 | 1 | 2 |
| Very well | 21 | 5 | 8 |
| Well | 21 | 11 | 15 |
| Not well / at all | 54 | 84 | 75 |

Source: https://www.migrationpolicy.org/data/unauthorized-immigrant-population/state/CA

**Appendix 3.3 Comparison of Demographic Profiles: CMS**

| | Center for Migration Studies | CHIS | |
|---|---|---|---|
| | 2015 | 2015 | 2015 |
| % Mexican born | 67% | 100% | 68% |
| Universe | All ages | Adults 18 years older | Adults 18 years older |
| Age* | (25+ years) | (25+ years) | (25+ years) |
| 25 to 34 | 37 | 32 | 37 |
| 35 to 44 | 36 | 38 | 35 |
| 45 or older | 27 | 29 | 27 |
| Sex | | | |
| Female | 46 | 51 | 48 |
| Male | 54 | 49 | 52 |
| Education | (18+ years old) | | |
| Less than HS | 50 | 71 | 63 |
| HS/GED | 23 | 19 | 17 |
| Some college | 14 | 5 | 6 |
| College or more | 12 | 4 | 15 |
| | | | |
| 0 to 99% FPL | 28 | 52 | 48 |
| Unemployed | 8 | 6 | 6 |
| Uninsured | 66 | 46 | 44 |
| Marital status | (15+ years old) | | |
| Married | 41 | 45 | 46 |
| Years in US | | | |
| Less than 5 | 13 | 4 | 14 |
| 5 to 9 | 24 | 9 | 11 |
| 10 to 14 | 25 | 29 | 28 |
| 15 to 19 | 14 | 25 | 21 |
| 20 or more | 24 | 33 | 26 |
| | | | |
| Speaks English | (5+ years old) | | |
| Very well or exclusively | 29 | 6 | 10 |
| Well | 22 | 14 | 18 |
| A little | 30 | 48 | 44 |
| Does not speak English | 20 | 33 | 28 |

Source: http://data.cmsny.org/

Appendix 3.4 Median Residency Duration of "Unauthorized" Population

| Pew | | CHIS | |
|---|---|---|---|
| **Year** | Median residency (years) | Cycle | Median residency (years) |
| **2005** | 8.0 | 2005 | 8 |
| **2007** | 8.6 | 2007 | 10 |
| **2009** | 10.0 | 2009 | 10 |
| **2011** | 11.5 | 2011/12 | 12 |
| **2013** | 12.8 | 2013/14 | 14 |
| **2014** | 13.6 | 2015 | 15 |

Source: http://www.pewhispanic.org/2016/09/20/overall-number-of-u-s-unauthorized-immigrants-holds-steady-since-2009/ph_2016-09-20_unauthorized-03/

**References**


1. Gleeson S, Gonzales RG. When Do Papers Matter? An Institutional Analysis of Undocumented Life in the United States. *Int Migr*. 2012;50(4):1-19. doi:10.1111/j.1468-2435.2011.00726.x
2. National Academies of Sciences E. *The Integration of Immigrants into American Society*.; 2015. doi:10.17226/21746
3. Young M-EDT, Madrigal DS. Documenting legal status: a systematic review of measurement of undocumented status in health research. *Public Health Rev*. 2017;38. doi:10.1186/s40985-017-0073-4
4. U.S. Government Accountability Office. *Estimating the Undocumented Population: A Grouped Answers Approach to Surveying Foreign-Born Respondents*. Washington, D.C.: U.S. GAO; 2006. http://www.gao.gov/products/GAO-06-775. Accessed June 29, 2015.
5. Tourangeau R, Rips LJ, Rasinski K. *The Psychology of Survey Response*. Cambridge University Press; 2000.
6. Tourangeau R, Yan T. Sensitive questions in surveys. *Psychol Bull*. 2007;133(5):859-883. doi:10.1037/0033-2909.133.5.859
7. Renzetti C, Lee R. Researching Sensitive Topics. *CRVAW Fac Book Gallery*. January 1993. http://uknowledge.uky.edu/crvaw_book/14.
8. Biemer PP. Total Survey Error: Design, Implementation, and Evaluation. *Public Opin Q*. 2010;74(5):817-848. doi:10.1093/poq/nfq058
9. Van Hook J, Bachmeier JD. How Well Does the American Community Survey Count Naturalized Citizens? *Demogr Res*. 2013;29(1):1-32. doi:10.4054/DemRes.2013.29.1
10. Bachmeier JD, Van Hook J, Bean FD. Can We Measure Immigrants' Legal Status? Lessons from Two U.S. Surveys. *Int Migr Rev*. 2014;48(2):538-566. doi:10.1111/imre.12059
11. Viana J. When We Ask, They Answer: Item-Nonresponse to Questions of Citizenship and Immigration Status in the California Health Interview Survey. *Well See*. Under Review.
12. Passel JS. *Percent of "Non–Green Card" Aliens Who Are Undocumented Immigrants, for Most Recent Period of Entry to the US, Based on Urban Institute Estimates Derived From March Current Population Surveys of 1999-2001: Custom Data Table*. Washington, DC: Urban Institue; 2002.
13. Livingston G. Hispanics, Health Insurance and Health Care Access. *Pew Res Cent Hisp Trends Proj*. September 2009. http://www.pewhispanic.org/2009/09/25/hispanics-health-insurance-and-health-care-access/. Accessed December 10, 2017.
14. Passel JS, Cohn D. Overall Number of U.S. Unauthorized Immigrants Holds Steady Since 2009. *Pew Res Cent Hisp Trends Proj*. September 2016. http://www.pewhispanic.org/2016/09/20/overall-number-of-u-s-unauthorized-immigrants-holds-steady-since-2009/. Accessed July 29, 2017.
15. Capps R, Fix M, Van Hook J, Bachmeier JD. *A DEMOGRAPHIC, SOCIOECONOMIC, AND HEALTH COVERAGE PROFILE OF UNAUTHORIZED IMMIGRANTS IN THE UNITED STATES*. Washington, D.C.: Migration Policy Institute; 2013. http://www.migrationpolicy.org/research/demographic-socioeconomic-and-health-coverage-profile-unauthorized-immigrants-united-states.
16. Warren R. Democratizing Data about Unauthorized Residents in the United States: Estimates and Public-Use Data, 2010 to 2013. *J Migr Hum Secur*. 2014;2(4):305-328. doi:10.14240/jmhs.v2i4.38

17. Pastor M, Scoggins J. *Estimating the Eligible-to-Naturalize Population*. USC Center for the Study of Immigrant Integration; 2016. http://dornsife.usc.edu/assets/sites/731/docs/CSII_Elig_Naturalize_Methodology_Final.pdf. Accessed September 16, 2016.
18. Medi-Cal FAQs 2014. http://www.dhcs.ca.gov/services/medi-cal/eligibility/Pages/Medi-CalFAQs2014b.aspx. Accessed December 10, 2017.
19. Your Guide for the American Community Survey (2014). November 2013. https://www2.census.gov/programs-surveys/acs/methodology/questionnaires/2014/guide14.pdf.
20. StataCorp. *Stata Statistical Software: Release 14*. College Station, Texas: Stata Corp LP; 2015.
21. Undocumented Immigrants in California. *Public Policy Inst Calif*. http://www.ppic.org/publication/undocumented-immigrants-in-california/. Accessed January 20, 2018.
22. Trends in Naturalization Rates:, 2008 Update. *Trends in Naturalization Rates: 2008 Update*. DHS Office of Immigration Statistics; 2009. https://www.dhs.gov/sites/default/files/publications/Naturalization%20Rates%202008.pdf. Accessed March 5, 2018.
23. NW 1615 L. St, Washington S 800, Inquiries D 20036 U-419-4300 | M-419-4349 | F-419-4372 | M. Unauthorized immigrants living in the U.S. longer. *Pew Res Cent Hisp Trends Proj*. September 2016. http://www.pewhispanic.org/2016/09/20/overall-number-of-u-s-unauthorized-immigrants-holds-steady-since-2009/ph_2016-09-20_unauthorized-03/. Accessed March 17, 2018.
24. Hook JV, Bachmeier JD, Coffman DL, Harel O. Can We Spin Straw Into Gold? An Evaluation of Immigrant Legal Status Imputation Approaches. *Demography*. 2014;52(1):329-354. doi:10.1007/s13524-014-0358-x
25. Carter-Pokras O, Zambrana RE. COLLECTION OF LEGAL STATUS INFORMATION: CAUTION! *Am J Public Health*. 2006;96(3):399. doi:10.2105/AJPH.2005.078253

## Chapter 4: Severe Psychological Distress Among Latino Adolescents with an Unauthorized Parent

### Introduction

There are persistent disparities in mental health for Latino youth.[1,2] For example, the Youth Risk Behavior Survey consistently finds higher prevalence of sad mood among Hispanic adolescents than others.[3–5] Similar findings have been reported regarding mood disorders in the National Comorbidity Survey – Adolescent Supplement[6] and in depressive symptoms in the California Health Interview Survey.[7] Collectively, anxiety and depressive symptoms are the most common manifestations of mental health disorders for Latino youth.[8] Understanding the etiology of poor mental health for Latino youth requires that we consider the broader context of social, cultural and political environments. Nationally, half of Latino youth live with an immigrant parent,[9] and a quarter of Latino youth live with an unauthorized parent.[10] As such, cultural-specific parenting as well as immigrant policies are important considerations in framing the health and well-being of Latino children.

#### *Children of Immigrant Parents*

The health and well-being of children of immigrants are often described in terms of risks and resilience.[11] Children in immigrant families are more likely to live in low-income working families, linguistically isolated households, and with less educated parents.[12] These known risk factors for worse mental and physical health also interact with unique cultural aspects of immigrant households in a variety of complicated ways.[13] Cultural considerations of immigrant households include acculturative stresses, differences in parental socialization, and language or cultural brokering on behalf of the parent. Discrimination, while not unique to immigrant households, is also acutely felt by children of immigrant parents. However, children of immigrant parents generally fare better than anticipated in light of these risks. This resilience is

often attributed to the many positive attributes of living in an immigrant household.[14] In particular, immigrant parents emphasize familism, academic achievement, and can help their children develop biculturalism and a positive ethnic identity.

There are few representative studies of mental health of Latino youth which considers parental nativity status.[6,13,15] The general consensus is that Latino children of immigrant parents have favorable mental health compared to Latino children of US born parents.[2] However, the literature is mixed, particularly regarding internalizing problems such as anxiety and depression.[13] A recent analysis of the only epidemiologic survey of mental health disorders among adolescents demonstrated significant variation in mental disorders among racial/ethnic minorities by parental nativity status.[16] Latino adolescents with two US born parents were significantly more likely than White adolescents of US born parents to have a mood or anxiety disorder, however this was not true of Latino adolescents of immigrant parents. This study did not find a significant difference in mental health disorders between Latino adolescents with US born parents compared to Latino adolescents of immigrant parents.

*Children of unauthorized immigrant parents*

An important attribute of immigrant parents is their legal status. Legal status can broadly be categorized in four categories, including naturalized citizenship, legal permanent residency, temporary legal residency and unauthorized status.[17] Unauthorized status is of particular importance because it confers distinct disadvantages by exacerbating pre-existing risks as well as introducing new ones. For example, unauthorized adults are typically relegated to strenuous but low-wage employment, and often are further exploited due to higher rates of limited English proficiency and inability to find other work legally.[18] An estimated four out of five children of an unauthorized parent are US born,[19] however by virtue of their parent's legal status they have

reduced access to public assistance intended to protect children from the consequences of growing up in poverty. In addition to cultural and linguistic barriers to accessing public assistance shared by immigrant parents broadly, unauthorized parents are further reluctant to disclose their own status to a government agency. The fear of deportation, or immigration enforcement more broadly, is a unique risk which weighs heavily on unauthorized parents.

Fears regarding immigration enforcement and family separation is a hallmark of families with unauthorized parents.[20] The majority of research on the consequences of immigration enforcement on child health are ethnographic studies.[21,22] These studies consistently find that children of unauthorized parents are scared of immigration enforcement, exhibiting symptoms of trauma,[23] depression,[24] psychological distress,[25] fear or other worse emotional well-being.[26–29] Generally, these studies find that children of parents who have been detained or deported exhibit the worst mental health consequences, however children of unauthorized parents who have not experienced the trauma first-hand have highly similar symptoms.[23–25,28] Based in this ethnographic work, the *deportation pyramid*[28] framework posits that while children who have been separated by their parents face the most severe consequences, immigration enforcement is most harmful to the larger number of children who live in fear of separation. Fortunately, there is also strong evidence that the mental health of children can be improved when their parents are protected from the threat of deportation. In a recent causal analysis of Medicaid claims data in Oregon, a mother's eligibility for DACA was associated with a 4.3-percentage point drop in diagnosed adjustment and anxiety disorders for their children, essentially halving the prevalence among this group compared to children without a DACA-eligible mother.[30]

A perspective that is largely missing in this literature is that of population surveys. Many designed attributes of population surveys, including large sample sizes, breadth of question

topics and representative sampling and weighting procedures contribute to rich datasets which can enable comparisons within groups with greater precision and reliability. To our knowledge, only one study has published on the mental health of unauthorized parents using population data. Landale and colleagues[31] used data from the first wave of the Los Angeles Family and Neighborhood Survey (LAFANS) regarding 2,535 children ages 3 to 17. A unique attribute of LAFANS data are questions regarding the legal status of the primary caregiver and sampled adult, which in practice is most typically the mother. Child behavioral functioning was measured by parent-report using the Behavior Problem Index which includes an internalizing subscale of 11 questions regarding sadness, anxiety, and withdrawn behavior, and an externalizing subscale of 17 questions regarding aggressiveness an impulsivity. In this data, children of unauthorized Mexican-mothers were found to have significantly higher internalizing and externalizing problems compared to all other children with the exception of children of unauthorized other-Latino mothers.

The first wave of LAFANS data collection occurred between 2000 and 2002, however immigration enforcement has since changed substantially. The number of annual removals increased consistently from a low of 165 thousand in 2002 to a high of 435 thousand in 2013.[32] Afterwards, removals decreased by 2015 to levels last seen in 2007. The geography of immigration enforcement also changed substantially, shifting from geographically concentrated workplace raids to more diffuse partnerships with state and local law enforcement.[22] Between 2009 and 2011, the number of removals from the interior was averaged roughly 200 thousand a year, however starting in 2012 this number decreased until it was more than halved by 2015-2016.[33] These shifts may have had important implications for immigrant families, although whether there have been changes in mental health consequences for children in immigrant

families is unknown. Notably, the number of mental health hospitalizations in California increased 88% for California Latino youth between 2007 and 2014, compared to a 21% increase for White youth and a 35% increase for African American youth.[34]

*Current study*

The present study uses data from the California Health Interview Survey (CHIS) to characterize the severe psychological distress of Latino adolescents while considering their generational status and their parents' legal status using data from 2007 to 2016. Pooling data that has been collected over the course of a decade improves sample size and statistical ability to detect significant differences between groups and also enables analyses of trends over time. These data, referred to as surveillance data, are critical in identifying emerging mental health needs and changes in at-risk populations.[35]

Severe psychological distress is a classification of general psychological distress; while not a formal diagnosis, it is used to screen for serious mental illness in the general population[36] and is indicative of functional limitations[37,38] and increased mortality.[39] Generational status considers the nativity of the individual as well as the nativity of their parents.[40] A foreign-born individual is considered to be 1st generation, a native-born individual with at least one foreign-born parent is considered to be 2nd generation, and a native-born individual with two native-born parents is considered to be 3rd generation or higher. The term "children of immigrants" refers to the 1st and 2nd generation, whereas the 3rd+ generation are not children of immigrants. Parental legal status is relevant for children of immigrants (1st and 2nd generations).

Consistent with findings from epidemiologic data on mood and anxiety disorders,[16] I hypothesize that severe psychological distress will be significantly higher among 3rd+ generation Latino adolescents compared to 3rd+ generation White adolescents. Consistent with the general

consensus that immigrant parents confer a protective advantage to the mental health of their children,[2] I hypothesize that psychological distress will be significantly higher among 3rd+ generation Latino adolescents compared to Latino adolescents with an immigrant parent. Consistent with previous findings from LAFANS that children of unauthorized Mexican mothers are more likely to have internalizing behavioral health problems compared to children of authorized mothers,[31] I hypothesize that severe psychological distress will be significantly higher among adolescents with unauthorized parents compared to authorized parents.

I also hypothesize that there will be significant changes over time. Specifically, I hypothesize that there will be a significant increase in severe psychological distress for Latino adolescents between 2007 and 2014, and that this trend will be significantly greater than for White adolescents. Further, I expect that compared to baseline (2007), severe psychological distress for adolescents with an unauthorized parent will be significantly higher during the peak of immigration enforcement (2009-2012), and then significantly decline by 2015-16 as immigration enforcement declined.

**Methods**

Data for this study come from the 2007 to 2016 cycles of the California Health Interview Survey (CHIS). CHIS is a telephone survey that is representative of the noninstitutionalized household population in California which has been conducted biennially until switching to continuous data collection in 2011. A preliminary roster of adults, adolescents (age 12-17) and children (age 0-11) is collected from surveyed households, from which one of each age group is sampled and administered a separate questionnaire. Sampled adolescents answer survey questions for themselves, however their parent or legal guardian are required to provide permission for teens to participate.

## Measures

### *Psychological distress*

Psychological distress is measured using the Kessler 6-item (K6) scale. The K6 was developed to measure nonspecific psychological distress among adults,[36] however has been demonstrated to have reliable psychometric properties among adolescents[41–44] and young adults.[45] The K6 asks participants how often during the past 30 days they felt nervous, hopeless, restless, depressed, worthless, and that everything was an effort using a 5-point Likert scale, which are then summed to a score which ranges between 0 and 24. A threshold for severe psychological distress has been established at scores of 13 or higher.[36]

### *Nativity and Legal Status*

Country of birth, citizenship and immigration status were directly measured for the sampled teens as well as the teen's parents. Naturalized citizenship was measured for people born outside of the US, and immigration status (permanent resident with a green card) was measured for noncitizens. Prior to the adolescent survey, the adult sampled to participate in CHIS reported on these dimensions regarding the adolescent's mother and father. The adolescent's own nativity and citizenship/immigration status was asked of the adolescent themselves. Consistent with previous research,[46–48] I consider Latino respondents who do not have a green card to be unauthorized. This assumption is based on estimates that 98% of nonpermanent Latino residents are unauthorized.[49] Legal status was operationalized as unauthorized (non-LPR), authorized (naturalized or LPR), and US born for descriptive statistics. For multivariate models, dummy variables were constructed to identify nativity status and unauthorized status for the adolescent's mother and father individually as well as for the parent-dyad.

*Covariates*

Consistent with previous studies on parental nativity and legal status and adolescent mental health,[16,31] multivariate models included adolescent sex, age (in years), family structure (one-parent household vs two-parent household), household poverty (less than 200% of the federal poverty line), education of the sampled adult (less than high school or GED vs. else), and urbanicity (urban vs. rural).

**Analysis**

Severe psychological distress (SPD) was analyzed using logistic regressions. Consistent with previous studies,[16,31] analyses were run using basic controls of age and sex, as well as using full controls of all covariates described above. To test for differences in SPD between Latino and White adolescents, a binary indicator of Latino ethnicity was used while restricting the universe to 3$^{rd+}$_generation Latino and White adolescents. To test for differences in SPD by parental nativity, three models restricted to Latino adolescents and were estimated using binary indicators of having an immigrant mother, and immigrant father, and either an immigrant mother or father. To test for differences in SPD among Latino adolescents by parental legal status, models were restricted to native born adolescents with at least one immigrant parent (2$^{nd}$ generation). Similar to models for parental nativity, models for parental legal status were estimated including binary indicators of unauthorized mother, an unauthorized father, and either an unauthorized mother or father. Additionally, a model was estimated with the binary indicators for having and unauthorized mother as well as an unauthorized father simultaneously, and a final model interacted the binary indicators for having an unauthorized mother and/or father into a four-level variable (no unauthorized parent, unauthorized mother and authorized father, authorized mother and unauthorized father, both unauthorized mother and father).

A total of eight cycles occurred between 2007 and 2016, with the sample size of the single year cycles (2011-2016) roughly half the size of the two biennial cycles (2007 & 2009). To combine data while maintain the complex survey design of CHIS, cycle-specific replicate weights were averaged and adjusted to reflect relative differences in sample size across cycles. All analyses were conducted using Stata 14. Trends over time were estimated by interacting the variable of interest with the CHIS cycle in the fully adjusted models and using the -margins- command.

**Results**

A total of 13,663 adolescents were interviewed between 2007 and 2016, of which 10,231 (75%) were a third-generation White adolescent (n=4,887) or a Latino adolescent (n=5,344). Of the Latino sample, 62 were foreign born adolescents of at least one US born parent and were excluded from the analysis for an analytic sample size of 10,169. White and Latino adolescents were demographically similar, however Latino adolescents had significantly higher risk factors for poor mental health [Table 4.1]. Overall, the mean K6 score was 4.5 (95% CI 4.3-4.6), and the average prevalence of severe psychological distress was 4.3% (95% CI 3.5%-5.3%). Unadjusted severe psychological distress between White and Latino adolescents (3.8% vs 4.6%) were not significantly different.

Of the Latino adolescents, 25% (n=1,188) were third+ generation, and 75% were children of immigrants (n=4,094), of which 79% (n=3,236) were second generation, and 21% were first generation (n=858) [Table 4.2]. In general, risk factors for poor mental health were still significantly higher for all Latino adolescents compared to White adolescents, and this gradient increased from third+ generation Latino to first generation Latino adolescents**.** Additionally, second and first generation Latino adolescents had significantly higher exposure to poverty and low household education compared to third+ generation Latino adolescents. Figure 4.1 illustrates

the proportion of adolescents by mother's and father's nativity and legal status. The two most populous cells were two US born parents (24.7%) and two non-LPR parents (18.8%). In total, 25% of adolescents were 3rd+ generation, 30% had at least one unauthorized parent, and 45% of adolescents had at least one authorized immigrant parent.

Bivariate associations between model parameters and severe psychological distress varied between adolescents [Table 4.3]. For all adolescents, SPD was less likely among females than males (OR=3.1, p<0.001), however this relationship was stronger among White (OR=5.9, p<0.001) as opposed to Latino (OR=2.4, p<0.05) adolescents. Compared with Latino adolescents with a US born mother, SPD was less common among Latino adolescents with an authorized mother (OR 0.47, p<0.01). Compared to US born Latino adolescents, SPD was less common among unauthorized adolescents (OR=0.47, p<0.05), but not among authorized adolescents. Accordingly, a dummy variable identifying unauthorized Latino adolescents was included as a control variable in subsequent models.

**Multivariate models**

In pooled multivariate models, SPD was not statistically different between White adolescents and Latino adolescents (AOR=1.17, p=0.52). Restricting Latino adolescents to the 3rd+ generation did not reveal a significant difference, however the adjusted odds ratio did nominally increase (AOR=1.52, p=0.22). In both models, females were significantly more likely to have SPD, and while not statistically significant, the continuous indicator of CHIS cycle indicated that SPD increased over time [Table 4.4]. Trends in SPD between 3rd+ generation Latino adolescents and 3rd+ generation White adolescents are presented visually in Figure 4.2. Among 3rd+ generation Latino adolescents, SPD increased overall between 2007 and 2013-14 (2.5% vs 10.7%, p=0.004), whereas SPD among 3rd+ generation White adolescents did not

increase in the same manner (3.0% vs 5.3%, p=0.172). Among 3rd+ generation Latinos, SPD decreased slightly from 10.7% in 2013-14 to 7.1% in 2015-16, however the confidence intervals for both periods are large and this difference was not statistically significant.

When parental nativity status was considered jointly, SPD was not statistically different between children in immigrant households compared to 3rd+ generation Latinos (AOR=0.56, p=0.14). When mother's and father's nativity status were analyzed separately, SPD was significantly less common among Latino adolescents with an immigrant mother compared to Latino adolescents with a US born mother (AOR=0.43, p=0.002), but not for Latinos with an immigrant father compared to adolescents with a US born father (AOR=0.84, p=0.63). These results are presented in Table 4.5. As observed in the bivariate analysis, the dummy control for unauthorized adolescents significantly predicted lower SPD. To avoid a potential bias in self-reported psychological distress, these same models were run excluding immigrant adolescents. Results from all Latinos with the dummy control were consistent with results from US born Latinos only. Trends in SPD by mother's and father's nativity status are visualized in Figures 4.3 and 4.4. In contrast to the increases in SPD among adolescents of US born mothers and fathers, SPD among immigrant mothers and fathers were relatively stable over time.

Parental legal status was evaluated among second generation Latino adolescents to avoid potential bias in self-reported SPD among immigrant adolescents. Among second generation Latino adolescents in the pooled model, having an unauthorized parent was not associated with increased SPD (AOR=1.37, p=0.32). When analyzed separately, having an unauthorized father was associated with significantly increased odds of SPD (AOR=1.91, $p<0.05$), however this was not observed with adolescents with an unauthorized mother (AOR=0.86, p=0.69). The countervailing effects of mother's unauthorized status and father's unauthorized status became

more apparent when they were considered simultaneously and interacted. Including dummy variables for both mother's and father's unauthorized status simultaneously, having an unauthorized father was associated with even greater odds of SPD (AOR=2.80, $p<0.01$) while having an unauthorized mother was associated with marginally significant lower odds of SPD (AOR=0.46, $p=0.07$). Interacting these two variables and having neither an unauthorized mother or father as the reference, adolescents with only an unauthorized mother had marginally significant lower odds of SPD (AOR=0.27, $p=0.06$), adolescents with only an unauthorized father had significantly higher odds of SPD (AOR=2.50, $p<0.05$), and adolescents with both an unauthorized mother and father were not significantly different (AOR=1.35, $p=0.44$). Figure 4.5 presents trends in SPD for adolescents with an unauthorized father and Figure 4.6 present trends in SPD for adolescents with an unauthorized mother. There were no significant trends over time or between cycles for unauthorized mothers or fathers, however both exhibited modest increases over time followed by considerable decreases in 2015-16.

**Discussion**

This study characterizes the mental health of Latino adolescents by their parent's nativity and legal status using representative data over a time period of considerable changes in immigration enforcement. I find that severe psychological distress (SPD) increased over time for Latino adolescents, and that this trend was driven primarily by 3rd+ generation Latino adolescents rather than Latino adolescents of immigrant parents. I find that having an immigrant mother was associated with significantly lower SPD, but that father's nativity did not significantly predict SPD. Among second generation Latino adolescents, having an unauthorized father was significantly associated with greater SPD, whereas having an unauthorized mother was typically associated with lower SPD. Collectively, these results suggest that parental nativity

and legal status meaningfully shape the mental health of their adolescents and reveal significant heterogeneity within the Latino adolescent population.

These results emphasize the importance of considering mother's and father's attributes separately as well as jointly to identify potentially countervailing effects. For example, the term "children of immigrants" refers to children of immigrant mothers, immigrant fathers, or both. When SPD was evaluated in this summative measure, no significant effect was found. However, when mother's and father's nativity were considered separately, the protective effect previously described became apparent for adolescents of immigrant mothers, an effect which was masked by the lack of an effect among immigrant fathers. Similarly, a summative measure identifying adolescents with at least one unauthorized parent masked significant differences between mother's and father's legal status. When considered independently, having an unauthorized father was significantly associated with a doubling of SPD whereas having an unauthorized mother still was not associated with differences in SPD. A limitation of this approach is that the reference groups are broad and overlap, making interpretations more difficult.

Operationalizing family-level legal status is difficult and dependent on the subject matter; there is no "correct" means of doing so.[50] The relatively common "low anchor" approach is not appropriate for this scenario, mostly because differences between mother's and father's often nullified each other. This became most apparent and easy to interpret when mother's and father's unauthorized status were interacted. Compared to second generation Latino adolescents without an unauthorized parent, having only an unauthorized father was significantly associated higher SPD, having an unauthorized mother only was marginally significantly ($p=0.06$) associated with lower SPD, however having both an unauthorized mother and father was not significantly associated with SPD.

The finding that having an unauthorized father is associated with significantly higher SPD is consistent with the threat of immigration enforcement, as roughly 90% of deportations are of Latino men.[51] The finding that unauthorized mothers generally appear to have a protective effect against SPD is less consistent with the literature. In particular, Landale's analysis of LAFANS found that children of unauthorized Mexican mothers had significantly higher internalizing mental health problems compared to others, including children of authorized and Mexican born mothers.

My findings also seem to differ from previous work by Ortega and colleagues using CHIS data to report on documentation status and parental concerns of developmental ability of their children,[52] which found that having two Mexican-heritage children with two unauthorized parents were had significantly higher parent-assessed risk of developmental status compared to White-US born children. Some of the inconsistency may be attributable to study design and response behavior. Both the Landale and Ortega study analyze parent-reported child outcomes, whereas this study analyzes self-reported adolescent outcomes. For both Landale and Ortega, child outcomes are in generally reported by the mother. If immigrant mothers, including unauthorized mothers, confer a protective effect via increased attention and concern over their children's health and development, we may expect that this to manifest in their report of child outcomes.

Similar issues may be at play in the finding that SPD was significantly less common among unauthorized immigrant Latino adolescents. This finding may reflect a real protective effect of being unauthorized, however this seems unlikely. Instead, this finding may reflect some measurement error in self-reported psychological distress. While previous work has validated the K6 questionnaire for use with adolescents, these validation studies have been with typically non-

minority adolescents. Recently, researchers have raised concerns that there is significant measurement nonequivalence in K6 scores by language and race/ethnicity.[53] It is unclear whether the finding that unauthorized Latino adolescents reported significantly less SPD involves a cultural bias, however models estimated without immigrant adolescents minimize this potential bias.

I find that there has been an increase in SPD among Latino youth between 2007 and 2013-14, and that this trend was driven by 3rd+ generation Latinos. This trend was not evident among Latino adolescents with immigrant parents, or among 3rd+ generation White adolescents. There are various potential explanations for this, however they go beyond the scope of this study. One potential explanation may be the *deportation pyramid* framework itself,[28] which posits that the broad base of all Latino children are most impacted by immigration enforcement. This is consistent with a *racialized legal status* framework,[54] which suggests that legal constructs such as immigration/authorization status have become inherently racialized and impact Latino's regardless of their legal status. While these frameworks may help explain why 3rd+ generation Latinos may be impacted by immigration enforcement despite their lack of direct risk, they do not explain why these same trends were not observed among children of immigrant parents. The deportation pyramid framework in particular cites confusion regarding risk and confusion of Latino ethnicity, immigrant and legal status. Presumably, the perception of risk would still be present, if not exacerbated, among children of immigrant parents. Instead, the relatively consistent prevalence of SPD among children of immigrant parents in contrast to increasing SPD among Latino children of US born parents may reflect the protective effect of having an immigrant parent, particularly an immigrant mother.

Because the effects of mothers' or fathers' nativity and legal status could be conflated by whether a child is from a single-parent or two-parent household, final models were restricted to two-parent households. This specification often resulted in losing the significant findings in parental nativity and legal status found in the general models; this effect was modest in the nativity model and stronger in the legal status model (Table 4.7). Regarding parental nativity, the restricted model did not exhibit the same significant effect for having an immigrant mother as the original model. The effect of having an immigrant father changed direction in the restricted model compared to the original model, however both effects had considerable standard errors and confidence intervals. Having two immigrant parents remained fairly consistent in both coefficient and significance. Regarding legal status, the protective effect of having an unauthorized mother and the increased risk associated with having an unauthorized father were which were significant in the original model were no longer significant in the restricted model although both were similar in the magnitude and direction of their effects.

One possible explanation for losing statistical significance in this sensitivity analysis may be related to statistical power due to the roughly 20% reduction in sample size for both models. This may be plausible since the reduction in sample size was proportionate across mothers' and fathers' legal status. This suggests no compositional differences between the original and restricted samples, which supports the use of the larger, original sample. Future research may examine whether the earlier findings regarding generational status using the National Comorbidity Survey data[16] or regarding parental legal status using LAFANS data[31] also change when analyses are restricted to two-parent households rather than controlling for single parents as a covariate.

There are a number of important limitations to consider regarding these findings. First, there has been a steady decline in sample size over time, particularly among the adolescent sample. Reduced sample size inherently compromises our ability to fully analyze trends over time. This imprecision is evident in the larger confidence intervals for the 2013-14 and 2015-16 cycles. Additionally, legal status may be overly sensitive to rely on self-reported data and may be of poor quality. This concern is also true of self-reported legal status used in Landale's analysis of LAFANS data. Conclusions drawn from the LAFANS data were bolstered by an evaluation of response behavior to these questions which found that the data were of good quality and fit for use.[55]

Previous analyses of response behavior in CHIS also indicate that self-reported legal status is also of good quality and fit for use. Having survey-specific evaluations of the quality of this data is important, because the sensitivity of a topic is largely determined by the context, and response behavior may differ from one survey to the next. For example, expert opinion is that data quality of self-reported legal status would be worse in government administered surveys compared to university-administered surveys.[56] Also, the evaluation of response behavior and data quality of LAFANS may not reflect later response behavior, as increased immigration enforcement may have made the topic more sensitive and prone to worse response behavior. As the previous analysis of self-reported legal status took a repeated cross-sectional approach, I observed that response behavior was largely consistent over time. Although reported in the previous analysis, we see evidence of consistent and willing disclosure of non-LPR status by the proportion of adults reported to have non-LPR mothers and fathers.

**Conclusion**

Latino youth are known to be at risk for poor mental health. Understanding this risk requires a comprehensive perspective that accounts for the nativity and legal status of their parents. We find the nativity/legal status of mothers and fathers influence adolescent mental health in distinct and unique ways, and considering these attributes as independent effects reveals important heterogeneity among Latino adolescents.

## Tables, Figures and Appendices

**Table 4.1 Sample descriptive statistics**

| | White | Latino | Overall | p-value |
|---|---|---|---|---|
| Unweighted n | 4,887 | 5,282 | 10,169 | |
| Weighted % | 35.8 | 64.2 | 100 | |
| **Psychological distress** | | | | |
| K6 (Mean) | 4.4 (4.1-4.7) | 4.5 (4.3-4.7) | 4.5 (4.3-4.6) | |
| Severe (K6>=13) (%) | 3.8 (2.8-5.2) | 4.6 (3.5-6.0) | 4.3 (3.5-5.3) | |
| **Child characteristics** | | | | |
| Female (%) | 47 | 49.2 | 48.4 | |
| Age (Mean) | 14.7 | 14.5 | 14.6 | |
| **Household/Adult characteristics** | | | | |
| <HS education | 2.4 | 36.3 | 24.1 | *** |
| Single parent | 25.2 | 31.4 | 29.2 | ** |
| <200% FPL | 6.1 | 33.9 | 24 | *** |
| Urban | 82.4 | 91.2 | 88 | *** |

Source: CHIS 2007-2016 Adolescent files

**Table 4.2 Sample Descriptive Statistics, by Generation status**

| | White | | Latino | |
|---|---|---|---|---|
| | Third+ | Third+ | Second | First |
| Unweighted n | 4,887 | 1,188 | 3,236 | 858 |
| Weighted % of Latinos | -- | 25 | 60 | 15 |
| **Psychological distress** | | | | |
| K6 (Mean, 95% CI) | 4.4 (4.1-4.7) | 4.8 (4.3-5.2) | 4.5 (4.2-4.7) | 4.3 (3.8-4.9) |
| Severe (K6>=13) (%, 95%CI) | 3.8 (2.8-5.2) | 6.3 (3.8-10.3) | 4.1 (3.0-5.4) | 3.9 (1.4-10.7) |
| **Child characteristics** | | | | |
| Female (%) | 47 | 48.6 | 48.8 | 51.8 |
| Age (Mean) | 14.7 | 14.5 | 14.5 | 14.6 |
| **Household/Adult characteristics** | | | | |
| <HS education | 2.4 | 7.2a | 43.1ab | 57.1ab |
| Single parent | 25.2 | 35.2 | 29.8 | 31.6a |
| <200% FPL | 6.1 | 17.5a | 34.2ab | 59.9ab |
| Urban | 82.4 | 90.5a | 91.9a | 89.2a |
| **Mother's nativity/legal status** | | | | |
| US born | -- | -- | 16.2 | -- |
| Naturalized or LPR | -- | -- | 59.3 | 35.9c |
| Non LPR | -- | -- | 24.5 | 64.1c |
| **Father's nativity/legal status** | | | | |
| US born | -- | -- | 12.5 | -- |
| Naturalized or LPR | -- | -- | 62.4 | 38.2c |
| Non LPR | -- | -- | 25.2 | 61.8c |
| **Adolescent's legal status** | | | | |
| Naturalized or LPR | -- | -- | -- | 42 |
| Non LPR | -- | -- | -- | 58 |

a: Significantly different than White
b: Significantly different than 3G Latino
c: Significantly different than 2G Latino

Source: CHIS 2007-2016 Adolescent files

**Table 4.3 Bivariate Associations with Severe Psychological Distress**

| | White n=4,887 | | Latino n=5,282 | |
|---|---|---|---|---|
| | OR | p | OR | p |
| **Child characteristics** | | | | |
| Female | 5.90 | <0.01 | 2.40 | 0.02 |
| Age | 1.20 | 0.15 | 0.97 | 0.65 |
| **Household/Adult characteristics** | | | | |
| <HS education | 0.63 | 0.47 | 1.24 | 0.46 |
| Single parent | 1.19 | 0.65 | 1.16 | 0.61 |
| <200% FPL | 1.93 | 0.31 | 0.60 | 0.10 |
| Urban | 0.86 | 0.69 | 1.76 | 0.17 |
| **Mother's nativity/legal status** | | | | |
| US born | | | ref | ref |
| Naturalized or LPR | | | 0.47 | 0.01 |
| Non LPR | | | 0.66 | 0.33 |
| **Father's nativity/legal status** | | | | |
| US born | | | ref | ref |
| Naturalized or LPR | | | 0.78 | 0.41 |
| Non LPR | | | 0.93 | 0.85 |
| **Adolescent's nativity/legal status** | | | | |
| US born | | | ref | ref |
| Naturalized or LPR | | | 1.54 | 0.622 |
| Non LPR | | | 0.34 | 0.02 |

Source: CHIS 2007-2016 Adolescent files

**Table 4.4 Severe Psychological Distress between White and Latino Adolescents**

| | All Latino adolescents (n=10,169) | | | | 3rd+ Generation Latino adolescents (n=6,075) | | | |
|---|---|---|---|---|---|---|---|---|
| | Basic | | Full | | Basic | | Full | |
| | AOR | p | AOR | p | AOR | p | AOR | p |
| Latino (v White) | 1.15 | 0.53 | 1.17 | 0.52 | 1.62 | 0.135 | 1.52 | 0.22 |
| Female | 3.11 | <0.01 | 3.14 | <0.01 | 3.67 | <0.01 | 3.64 | <0.01 |
| Age (years) | 1.02 | 0.78 | 1.01 | 0.82 | 1.08 | 0.34 | 1.08 | 0.36 |
| CHIS cycle (cont.) | 1.17 | 0.08 | 1.17 | 0.08 | 1.23 | 0.07 | 1.21 | 0.09 |
| | | | | | | | | |
| <HS education | | | 1.42 | 0.27 | | | 0.84 | 0.82 |
| Single parent | | | 1.24 | 0.39 | | | 0.94 | 0.86 |
| <200% FPL | | | 0.62 | 0.17 | | | 1.66 | 0.31 |
| Urban | | | 1.24 | 0.45 | | | 1.08 | 0.80 |
| Non-LPR adolescent | | | 0.35 | 0.03 | | | | |

Source: CHIS 2007-2016 Adolescent files

**Table 4.5 Severe Psychological Distress by Parents' Nativity**

| | Either parent | | | | Mother | | | | Father | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n=5,282 | | n=4,424 | | n=5,282 | | n=4,424 | | n=5,282 | | n=4,424 | |
| | AOR | p | AOR | p | AOR | p | AOR | p | AOR | p | AOR | p |
| Immigrant parent | 0.57 | 0.15 | 0.56 | 0.14 | 0.45 | <0.01 | 0.43 | <0.01 | 0.87 | 0.68 | 0.84 | 0.63 |
| Female | 2.42 | 0.02 | 2.70 | <0.01 | 2.40 | 0.02 | 2.69 | <0.01 | 2.41 | 0.02 | 2.71 | <0.01 |
| Age (years) | 0.96 | 0.55 | 0.98 | 0.82 | 0.95 | 0.50 | 0.98 | 0.73 | 0.96 | 0.54 | 0.98 | 0.80 |
| CHIS cycle (cont) | 1.17 | 0.16 | 1.12 | 0.29 | 1.18 | 0.14 | 1.13 | 0.25 | 1.17 | 0.17 | 1.11 | 0.30 |
| <HS education | 1.92 | 0.05 | 1.53 | 0.21 | 2.21 | <0.01 | 1.79 | 0.05 | 1.64 | 0.14 | 1.31 | 0.42 |
| Single parent | 1.20 | 0.59 | 1.12 | 0.70 | 1.17 | 0.63 | 1.09 | 0.76 | 1.23 | 0.53 | 1.15 | 0.63 |
| <200% FPL | 0.52 | 0.10 | 0.70 | 0.33 | 0.53 | 0.10 | 0.71 | 0.35 | 0.51 | 0.09 | 0.68 | 0.31 |
| Urban | 1.90 | 0.13 | 1.77 | 0.23 | 1.92 | 0.13 | 1.81 | 0.22 | 1.86 | 0.14 | 1.72 | 0.25 |
| Non-LPR adolescent | 0.41 | 0.06 | n/a | n/a | 0.46 | 0.10 | n/a | n/a | 0.38 | 0.04 | n/a | n/a |

Source: CHIS 2007-2016 Adolescent files

**Table 4.6 Adolescent Severe Psychological Distress by Parent's Legal Status**

| | AOR | p | AOR | p | AOR | p | AOR | p | AOR | p |
|---|---|---|---|---|---|---|---|---|---|---|
| Unauthorized parent | 1.38 | 0.32 | | | | | | | | |
| Unauthorized Mother | | | 0.86 | 0.69 | | | 0.46 | 0.07 | | |
| Unauthorized father | | | | | 1.91 | 0.04 | 2.80 | <0.01 | | |
| No Unauthorized parent | | | | | | | | | ref | ref |
| Unauthorized mother | | | | | | | | | 0.27 | 0.06 |
| Unauthorized Father | | | | | | | | | 2.50 | 0.03 |
| Both Unauthorized | | | | | | | | | 1.35 | 0.44 |
| | | | | | | | | | | |
| Female | 3.29 | <0.01 | 3.26 | <0.01 | 3.3 | <0.01 | 3.29 | <0.01 | 3.28 | <0.01 |
| Age (years) | 0.98 | 0.81 | 0.97 | 0.63 | 0.99 | 0.88 | 0.97 | 0.74 | 0.97 | 0.73 |
| CHIS cycle (cont) | 1.00 | 1.00 | 1.02 | 0.86 | 0.99 | 0.92 | 1.01 | 0.91 | 1.01 | 0.92 |
| <HS education | 1.73 | 0.15 | 1.81 | 0.12 | 1.72 | 0.16 | 1.87 | 0.10 | 1.86 | 0.11 |
| Single parent | 1.36 | 0.39 | 1.38 | 0.40 | 1.33 | 0.43 | 1.24 | 0.56 | 1.26 | 0.52 |
| <200% FPL | 0.41 | 0.04 | 0.48 | 0.06 | 0.37 | 0.02 | 0.41 | 0.03 | 0.41 | 0.04 |
| Urban | 1.65 | 0.52 | 1.70 | 0.49 | 1.66 | 0.52 | 1.68 | 0.50 | 1.69 | 0.50 |

Source: CHIS 2007-2016 Adolescent files

**Table 4.7 Sensitivity Analysis: Limiting to Two-Parent Households**

| | Immigrant (all Latino adolescents) | | | | Non-LPR (2nd generation adolescents) | | | |
|---|---|---|---|---|---|---|---|---|
| | Original (n=5,282) | | 2-parent HH (n=4,158) | | Original (n=3,236) | | 2-parent HH (n=2,578) | |
| | AOR | p | AOR | p | AOR | p | AOR | p |
| Mother | 0.18 | 0.02 | 0.19 | 0.15 | 0.27 | 0.06 | 0.20 | 0.16 |
| Father | 1.05 | 0.93 | 0.52 | 0.56 | 2.50 | 0.03 | 1.11 | 0.88 |
| Both parents | 0.53 | 0.07 | 0.45 | 0.08 | 1.35 | 0.44 | 1.10 | 0.89 |
| | | | | | | | | |
| Female | 2.42 | 0.02 | 2.71 | 0.02 | 3.28 | <0.01 | 3.17 | <0.01 |
| Age (years) | 0.95 | 0.53 | 1.04 | 0.65 | 0.97 | 0.73 | 1.08 | 0.45 |
| CHIS cycle (cont.) | 1.19 | 0.12 | 1.25 | 0.10 | 1.01 | 0.92 | 1.10 | 0.58 |
| <HS education | 2.07 | 0.01 | 2.52 | 0.02 | 1.86 | 0.11 | 2.51 | 0.08 |
| Single parent | 1.21 | 0.57 | n/a | n/a | 1.26 | 0.52 | n/a | n/a |
| <200% FPL | 0.52 | 0.09 | 0.4 | 0.04 | 0.41 | 0.04 | 0.40 | 0.10 |
| Urban | 1.95 | 0.12 | 2.14 | 0.20 | 1.69 | 0.50 | 1.57 | 0.64 |

Source: CHIS 2007-2016 Adolescent files

**Figure 4.1a Parent Legal Status: Four-category low anchor**

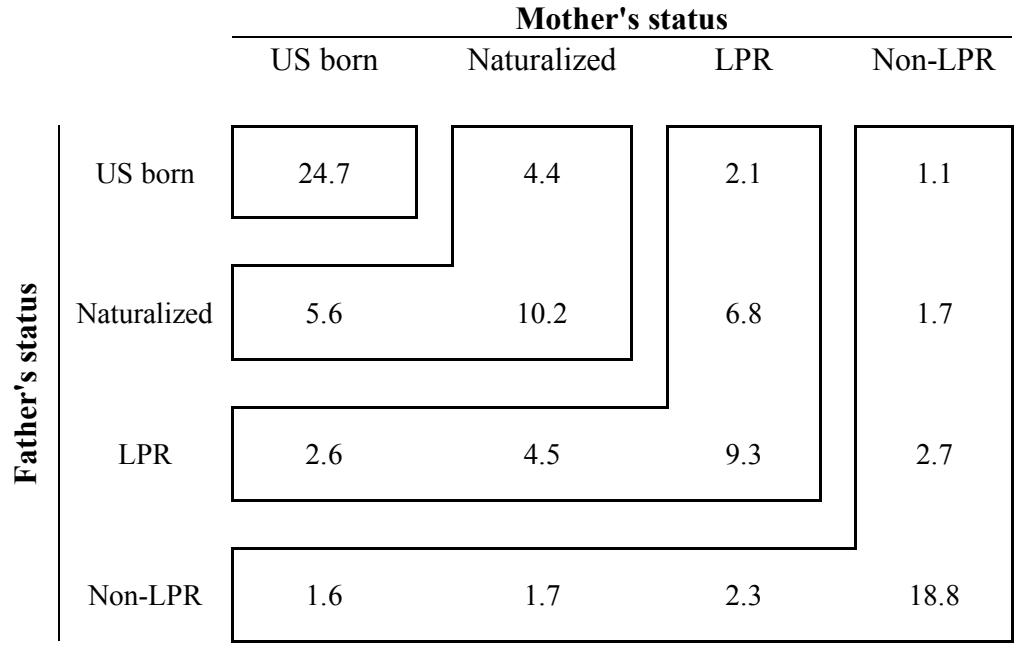
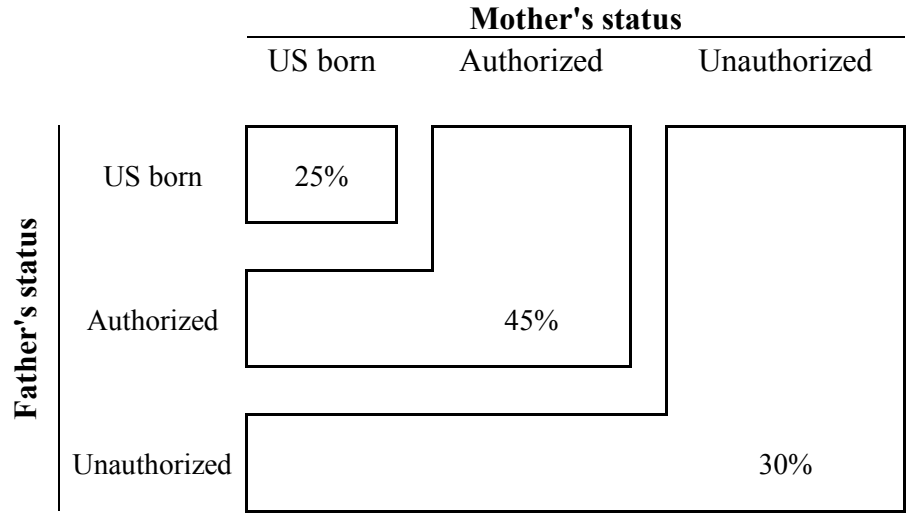
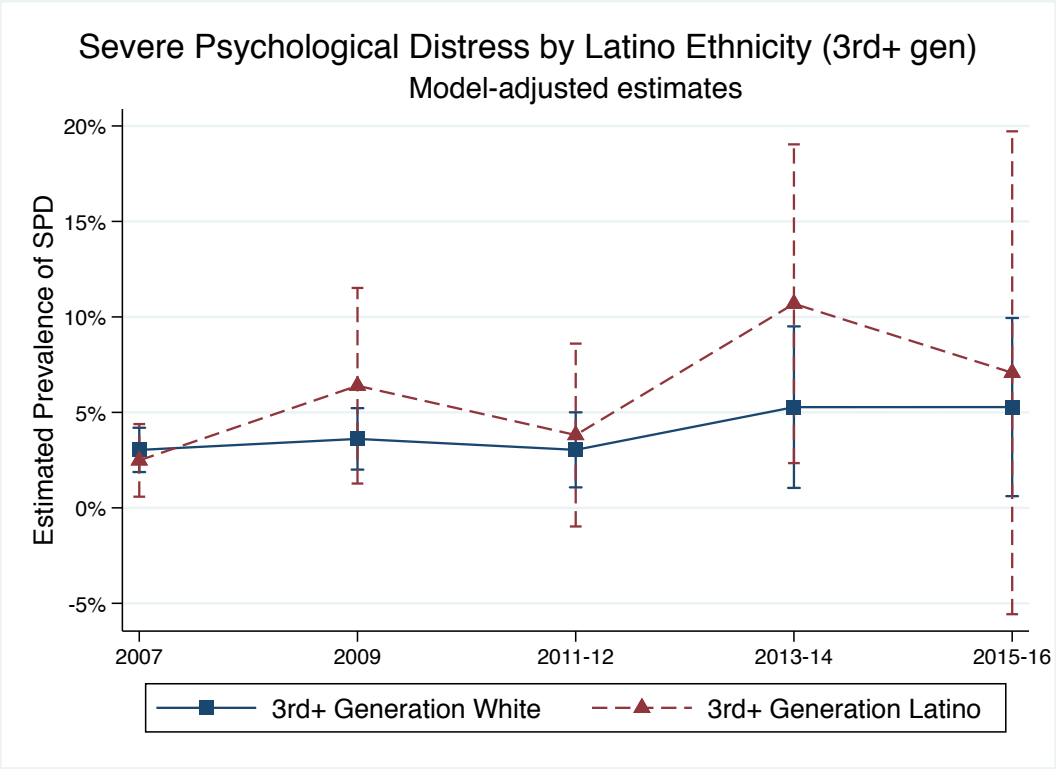



**Figure 4.1b Parent Legal Status: Three-category low anchor**




Source: CHIS 2007-2016 Adolescent files

**Figure 4.2 Severe Psychological Distress by Race/Ethnicity (3rd+ Generation)**




Source: CHIS 2007-2016 Adolescent files

**Figure 4.3 Severe Psychological Distress Among Latinos by Father's Nativity**

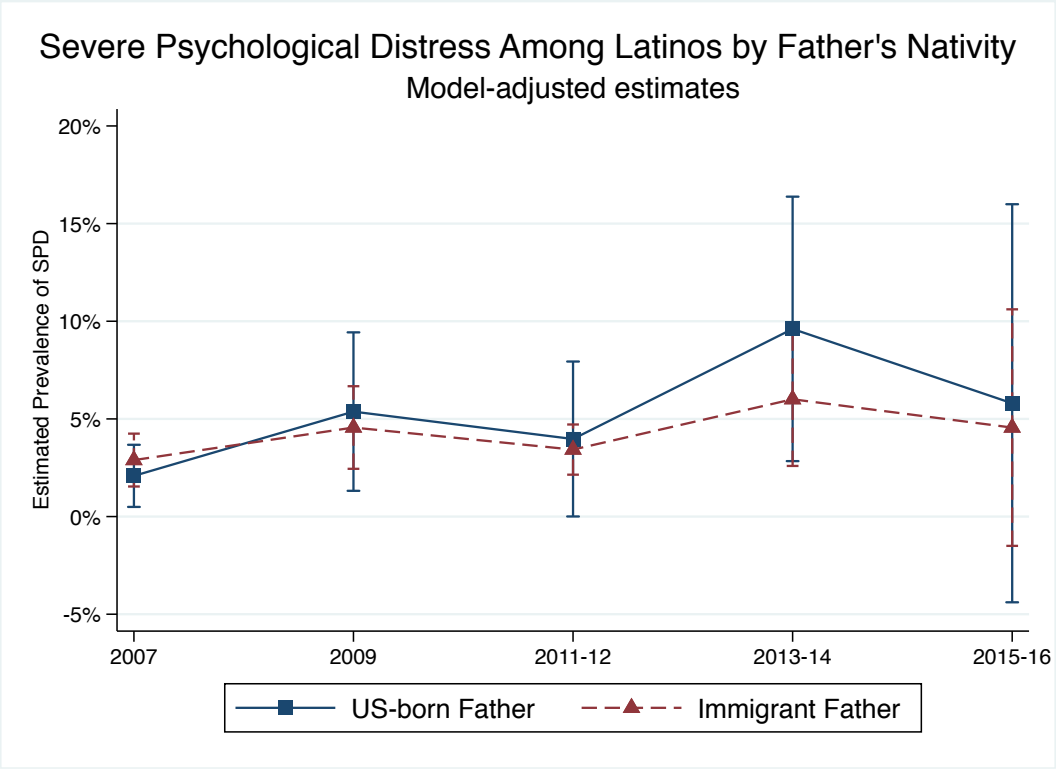
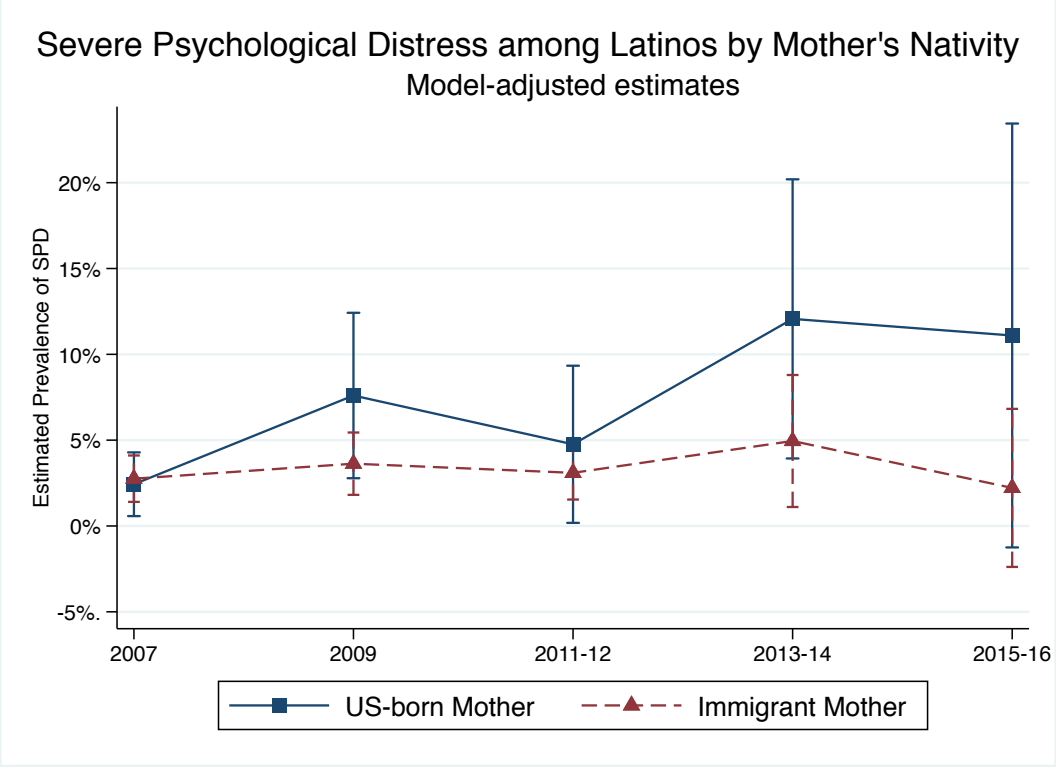



**Figure 4.4 Severe Psychological Distress Among Latinos by Mother's Nativity**




Source: CHIS 2007-2016 Adolescent files

**Figure 4.5 Severe Psychological Distress Among 2nd Generation Latinos: By Father's Nativity/Legal Status**

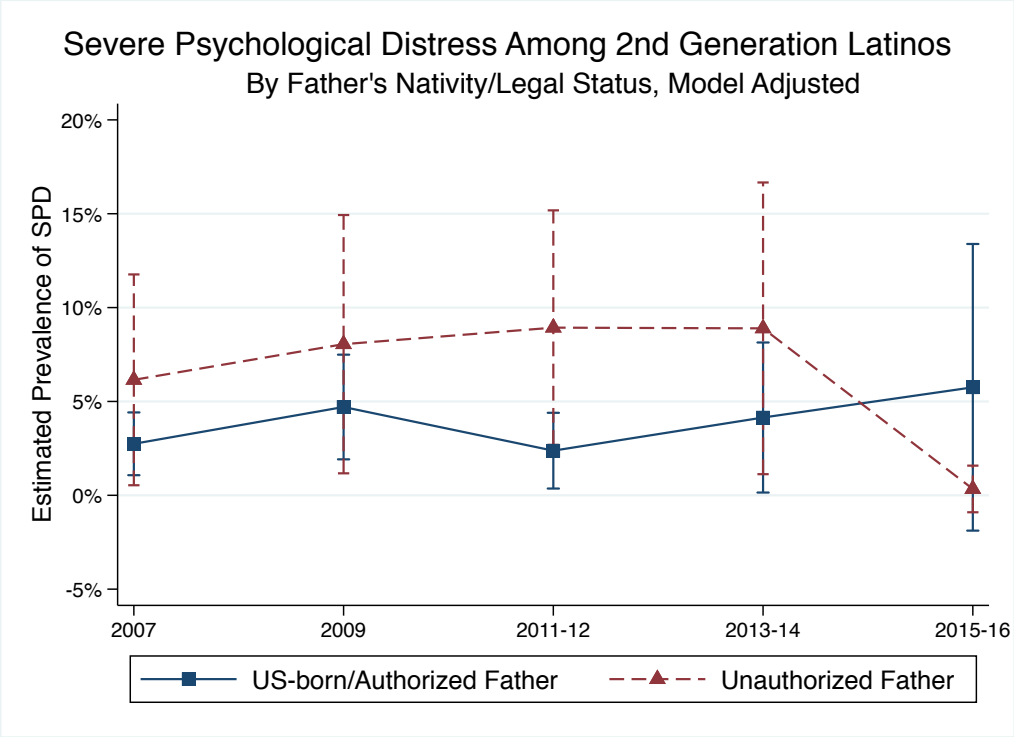
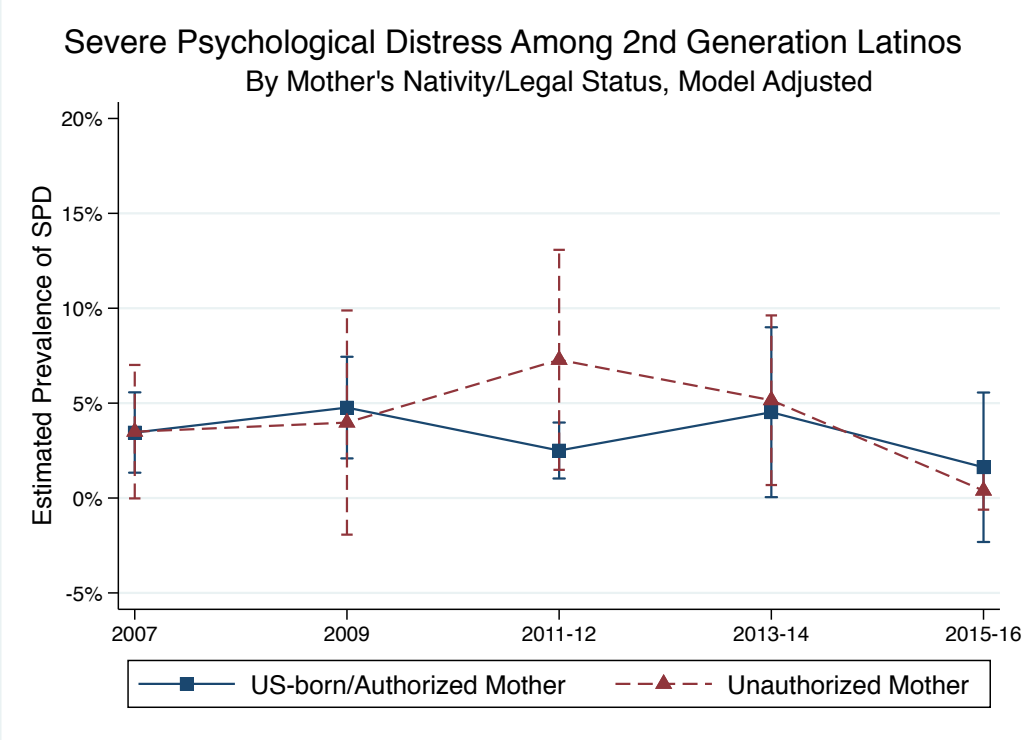
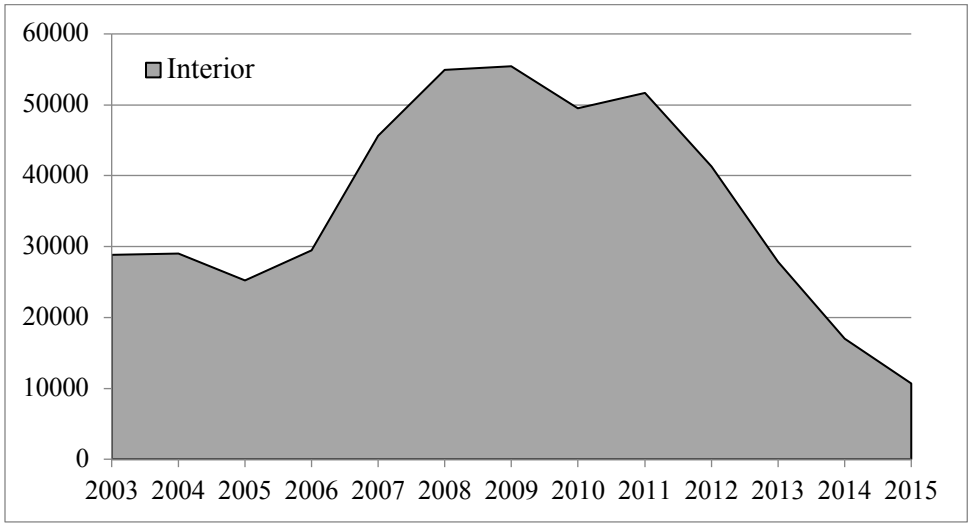



**Figure 4.6 Severe Psychological Distress Among 2nd Generation Latinos by Mother's Nativity/Legal Status**




Source: CHIS 2007-2016 Adolescent files

**Appendix 4.1 Number of Removals from the California Interior Over Time**




**Appendix 4.2 Table of Removals from the California Interior Over Time**

| Fiscal Year | Removals | % Change |
|---|---|---|
| 2003 | 28,860 | |
| 2004 | 28,979 | 0.4% |
| 2005 | 25,259 | -12.8% |
| 2006 | 29,422 | 16.5% |
| 2007 | 45,612 | 55.0% |
| 2008 | 54,913 | 20.4% |
| 2009 | 55,439 | 1.0% |
| 2010 | 49,543 | -10.6% |
| 2011 | 51,689 | 4.3% |
| 2012 | 41,322 | -20.1% |
| 2013 | 27,863 | -32.6% |
| 2014 | 17,009 | -39.0% |
| 2015 | 10,677 | -37.2% |

**Source:** TRAC Immigration, Syracuse University

**References**


1. Alegria M, Vallas M, Pumariega A. Racial and Ethnic Disparities in Pediatric Mental Health. *Child Adolesc Psychiatr Clin N Am*. 2010;19(4):759-774. doi:10.1016/j.chc.2010.07.001
2. Yvette G. Flores. *Chicana and Chicano Mental Health*. Tuscon: University of Arizona Press; 2013.
3. Eaton DK, Kann L, Kinchen S, et al. Youth Risk Behavior Surveillance — United States, 2011. *Morb Mortal Wkly Rep Surveill Summ*. 2012;61(4):1-162.
4. Kann L, Kinchen S, Shanklin SL, et al. Youth risk behavior surveillance--United States, 2013. *MMWR Suppl*. 2014;63(4):1-168.
5. Kann L. Youth Risk Behavior Surveillance — United States, 2015. *MMWR Surveill Summ*. 2016;65. doi:10.15585/mmwr.ss6506a1
6. Merikangas KR, He J, Burstein M, et al. Lifetime Prevalence of Mental Disorders in US Adolescents: Results from the National Comorbidity Study-Adolescent Supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry*. 2010;49(10):980-989. doi:10.1016/j.jaac.2010.05.017
7. Mikolajczyk RT, Bredehorst M, Khelaifat N, Maier C, Maxwell AE. Correlates of depressive symptoms among Latino and Non-Latino White adolescents: Findings from the 2003 California Health Interview Survey. *BMC Public Health*. 2007;7:21. doi:10.1186/1471-2458-7-21
8. Saluja G, Iachan R, Scheidt PC, Overpeck MD, Sun W, Giedd JN. Prevalence of and Risk Factors for Depressive Symptoms Among Young Adolescents. *Arch Pediatr Adolesc Med*. 2004;158(8):760-765. doi:10.1001/archpedi.158.8.760
9. Children of Immigrants Data Tool. http://datatool.urban.org/charts/datatool/pages.cfm. Accessed April 12, 2018.
10. One Quarter of Hispanic Children in the United States Have an Unauthorized Immigrant Parent | Hispanic Research Center. http://www.hispanicresearchcenter.org/publications/one-quarter-of-hispanic-children-in-the-united-states-have-an-unauthorized-immigrant-parent/. Accessed May 9, 2018.
11. Is the United States Bad for Children's Health? Risk and Resilience among Young Children of Immigrants. migrationpolicy.org. https://www.migrationpolicy.org/research/united-states-bad-children%E2%80%99s-health-risk-and-resilience-among-young-children-immigrants. Published July 1, 2013. Accessed February 16, 2018.
12. Woods T, Hanson D. Demographic Trends of Children of Immigrants. Urban Institute. https://www.urban.org/research/publication/demographic-trends-children-immigrants. Published October 17, 2016. Accessed February 14, 2018.
13. Kim SY, Schwartz SJ, Perreira KM, Juang LP. Culture's Influence on Stressors, Parental Socialization, and Developmental Processes in the Mental Health of Children of Immigrants. *Annu Rev Clin Psychol*. 2018;14(1):null. doi:10.1146/annurev-clinpsy-050817-084925
14. Cardoso JB, Thompson SJ. Common Themes of Resilience among Latino Immigrant Families: A Systematic Review of the Literature. *Fam Soc*. 2010;91(3):257-265. doi:10.1606/1044-3894.4003
15. Isasi CR, Rastogi D, Molina K. Health Issues in Hispanic/Latino Youth. *J Lat Psychol*. 2016;4(2):67-82. doi:10.1037/lat0000054

16. Georgiades K, Paksarian D, Rudolph KE, Merikangas KR. Prevalence of Mental Disorder and Service Use by Immigrant Generation and Race/Ethnicity Among U.S. Adolescents. *J Am Acad Child Adolesc Psychiatry*. 2018;57(4):280-287.e2. doi:10.1016/j.jaac.2018.01.020
17. National Academies of Sciences E. *The Integration of Immigrants into American Society*.; 2015. doi:10.17226/21746
18. Hirokazu Yoshikawa. *Immigrants Raising Citizens*. Russell Sage Foundation; 2011. https://www.russellsage.org/publications/immigrants-raising-citizens. Accessed August 27, 2016.
19. A Profile of U.S. Children with Unauthorized Immigrant Parents. migrationpolicy.org. http://www.migrationpolicy.org/research/profile-us-children-unauthorized-immigrant-parents. Published January 11, 2016. Accessed June 18, 2016.
20. Yoshikawa H, Suárez-Orozco C, Gonzales RG. Unauthorized Status and Youth Development in the United States: Consensus Statement of the Society for Research on Adolescence. *J Res Adolesc*. 2017;27(1):4-19. doi:10.1111/jora.12272
21. Brabeck KM, Lykes MB, Hunter C. The psychosocial impact of detention and deportation on U.S. Migrant children and families. *Am J Orthopsychiatry*. 2014;84(5):496-505. doi:http://dx.doi.org/10.1037/ort0000011
22. Implications of Immigration Enforcement Activities for the Well-Being of Children in Immigrant Families: A Review of the Literature. migrationpolicy.org. http://www.migrationpolicy.org/research/implications-immigration-enforcement-activities-well-being-children-immigrant-families. Published September 17, 2015. Accessed June 18, 2016.
23. Rojas-Flores L, Clements ML, Hwang Koo J, London J. Trauma and psychological distress in Latino citizen children following parental detention and deportation. *Psychol Trauma Theory Res Pract Policy*. 2017;9(3):352-361. doi:10.1037/tra0000177
24. Gulbas LE, Zayas LH, Yoon H, Szlyk H, Aguilar-Gaxiola S, Natera G. Deportation experiences and depression among U.S. citizen-children with undocumented Mexican parents. *Child Care Health Dev*. 2016;42(2):220-230. doi:10.1111/cch.12307
25. Zayas LH, Aguilar-Gaxiola S, Yoon H, Rey GN. The Distress of Citizen-Children with Detained and Deported Parents. *J Child Fam Stud*. 2015;24(11):3213-3223. doi:10.1007/s10826-015-0124-8
26. Brabeck K, Xu Q. The Impact of Detention and Deportation on Latino Immigrant Children and Families: A Quantitative Exploration. *Hisp J Behav Sci*. 2010;32(3):341-361. doi:10.1177/0739986310374053
27. Chaudry A, Capps R, Pedroza J, Castaneda RM, Santos R, Scott MM. Facing Our Future. Urban Institute. https://www.urban.org/research/publication/facing-our-future. Published 2010. Accessed February 1, 2018.
28. Dreby J. The Burden of Deportation on Children in Mexican Immigrant Families. *J Marriage Fam*. 2012;74(4):829-845. doi:10.1111/j.1741-3737.2012.00989.x
29. Delva J, Horner P, Sanders L, Martinez R, Lopez W, Doering-White J. Mental health problems of children of undocumented parents in the United States: a hidden crisis. *J Community Posiivet Pract*. 2013;13:23-35.
30. Hainmueller J, Lawrence D, Martén L, et al. Protecting unauthorized immigrant mothers improves their children's mental health. *Science*. 2017;357(6355):1041-1044. doi:10.1126/science.aan5893

31. Landale NS, Hardie JH, Oropesa RS, Hillemeier MM. Behavioral Functioning among Mexican-origin Children Does Parental Legal Status Matter? *J Health Soc Behav*. 2015;56(1):2-18. doi:10.1177/0022146514567896
32. Gonzalez-Barrera A, Krogstad JM. U.S. immigrant deportations declined in 2014, but remain near record high. *Pew Res Cent*. August 2016. http://www.pewresearch.org/fact-tank/2016/08/31/u-s-immigrant-deportations-declined-in-2014-but-remain-near-record-high/. Accessed December 10, 2017.
33. The Obama Record on Deportations: Deporter in Chief or Not? | migrationpolicy.org. https://www.migrationpolicy.org/article/obama-record-deportations-deporter-chief-or-not. Accessed May 1, 2018.
34. Wiener J. Latino Youth In California See Significant Rise In Psychiatric Hospitalizations. *Kais Health News*. February 2016. https://khn.org/news/latino-youth-in-california-see-significant-rise-in-psychiatric-hospitalizations/. Accessed May 1, 2018.
35. Mental Health Surveillance Among Children — United States, 2005–2011. https://www.cdc.gov/mmwr/preview/mmwrhtml/su6202a1.htm. Accessed March 10, 2018.
36. Kessler RC, Barker PR, Colpe LJ, et al. Screening for serious mental illness in the general population. *Arch Gen Psychiatry*. 2003;60(2):184-189.
37. Pratt LA, Dey AN, Cohen AJ. Characteristics of adults with serious psychological distress as measured by the K6 scale: United States, 2001-04. *Adv Data*. 2007;(382):1-18.
38. Judith Weissman, Laura A. Pratt, Eric A. Miller, Jennifer D. Parker. *Serious Psychological Distress among Adults: United States, 2009–2013*. Hyattsville, MD: National Center for Health Statistics; 2015. https://www.cdc.gov/nchs/data/databriefs/db203.pdf.
39. Pratt LA. Serious psychological distress, as measured by the K6, and mortality. *Ann Epidemiol*. 2009;19(3):202-209. doi:10.1016/j.annepidem.2008.12.005
40. NW 1615 L. St, Washington S 800, Inquiries D 20036 U-419-4300 | M-419-4372 | M. Demographic Research: Definitions. *Pew Res Cent*. January 2015. http://www.pewresearch.org/methodology/demographic-research/definitions/. Accessed August 13, 2018.
41. Green JG, Gruber MJ, Sampson NA, Zaslavsky AM, Kessler RC. Improving the K6 short scale to predict serious emotional disturbance in adolescents in the USA. *Int J Methods Psychiatr Res*. 2010;19 Suppl 1:23-35. doi:10.1002/mpr.314
42. Li F, Green JG, Kessler RC, Zaslavsky AM. Estimating prevalence of serious emotional disturbance in schools using a brief screening scale. *Int J Methods Psychiatr Res*. 2010;19 Suppl 1:88-98. doi:10.1002/mpr.315
43. Nicholas Peiper, Richard Clayton, Richard Wilson, Robert Illback. The Performance of the K6 Scale in a Large School Sample. *Psychol Assess*. September 2014. doi:http://dx.doi.org/10.1037/pas0000025
44. Peiper N, Lee A, Lindsay S, Drashner N, Wing J. The performance of the K6 scale in a large school sample: A follow-up study evaluating measurement invariance on the Idaho Youth Prevention Survey. *Psychol Assess*. 2016;28(6):775-779. doi:10.1037/pas0000188
45. Bessaha ML. Factor Structure of the Kessler Psychological Distress Scale (K6) Among Emerging Adults. *Res Soc Work Pract*. 2017;27(5):616-624. doi:10.1177/1049731515594425
46. Ortega AN, Fang H, Perez VH, et al. Health care access, use of services, and experiences among undocumented Mexicans and other Latinos. *Arch Intern Med*. 2007;167(21):2354-2360. doi:10.1001/archinte.167.21.2354

47. Bustamante AV, Fang H, Garza J, et al. Variations in Healthcare Access and Utilization Among Mexican Immigrants: The Role of Documentation Status. *J Immigr Minor Health*. 2012;14(1):146-155. doi:10.1007/s10903-010-9406-9
48. Oropesa RS, Landale NS, Hillemeier MM. Legal Status and Health Care: Mexican-Origin Children in California, 2001–2014. *Popul Res Policy Rev*. 2016;35(5):651-684. doi:10.1007/s11113-016-9400-6
49. Livingston G. Hispanics, Health Insurance and Health Care Access. *Pew Res Cent Hisp Trends Proj*. September 2009. http://www.pewhispanic.org/2009/09/25/hispanics-health-insurance-and-health-care-access/. Accessed December 10, 2017.
50. Oropesa RS, Landale NS, Hillemeier MM. Family legal status and health: Measurement dilemmas in studies of Mexican-origin children. *Soc Sci Med*. 2015;138:57-67. doi:10.1016/j.socscimed.2015.05.038
51. ICE Deportations: Gender, Age, and Country of Citizenship. http://trac.syr.edu/immigration/reports/350/. Accessed May 11, 2018.
52. Ortega AN, Horwitz SM, Fang H, Kuo AA, Wallace SP, Inkelas M. Documentation status and parental concerns about development in young US children of Mexican origin. *Acad Pediatr*. 2009;9(4):278-282. doi:10.1016/j.acap.2009.02.007
53. Kim G, DeCoster J, Bryant AN, Ford KL. Measurement Equivalence of the K6 Scale: The Effects of Race/Ethnicity and Language. *Assessment*. 2016;23(6):758-768. doi:10.1177/1073191115599639
54. Asad AL, Clair M. Racialized legal status as a social determinant of health. *Soc Sci Med*. March 2017. doi:10.1016/j.socscimed.2017.03.010
55. Bachmeier JD, Van Hook J, Bean FD. Can We Measure Immigrants' Legal Status? Lessons from Two U.S. Surveys. *Int Migr Rev*. 2014;48(2):538-566. doi:10.1111/imre.12059
56. U.S. Government Accountability Office. *Estimating the Undocumented Population: A Grouped Answers Approach to Surveying Foreign-Born Respondents*. Washington, D.C.: U.S. GAO; 2006. http://www.gao.gov/products/GAO-06-775. Accessed June 29, 2015.

## CHAPTER 5: Conclusion

An estimated 5.1 million children in the United States has a parent who lacks legal status.[1] Despite their own citizenship – four out of five these children are citizens by birthright[1] – the health and development of these children is strongly shaped by their parents' legal status. Measuring legal status would be an important step forward in understanding the immigrant population and their children, and there are continued calls to include questions related to legal status in large, population surveys.[2,3] However, legal status may be an overly sensitive topic and self-reported data may be problematically incomplete or inaccurate.[3,4] While the feasibility of collecting data on legal status is a matter of debate, legal status is an important social determinant of health for first- and second-generation Americans. It is important that we critically evaluate the capacity of current public health data to speak on issues related to the health of immigrant families.

One of the most salient aspects of unauthorized status is the persistent threat of deportation. As recognized by the American Academy of Pediatrics, children who fear that their parent could be deported experience a toxic stress which could have life-long health consequences.[5] There are multiple reports that these fears have been exacerbated; pediatricians and parents are reporting that children are increasingly distressed and in worse mental health.[6,7] From a public health perspective, the consequences of potentially millions of children experiencing a shock of toxic stress could be substantial. Childhood and adolescence are sensitive periods of neurodevelopment,[8] with roughly half of all mental health disorders first manifesting before adulthood.[9] The total costs associated with mental health disorders for children and young adults is estimated to be $247 billion per year.[10]

**Scope of Work and Summary of Findings**

The California Health Interview Survey (CHIS) may be uniquely positioned to monitor the mental health of children with an unauthorized parent as one of the only ongoing population representative surveys that directly measures legal status. However, this is dependent on the quality of self-reported data from respondents, which has not been evaluated. It is also unknown to what extent data quality might change in the context of shifting immigration enforcement practices and threats of deportation. Increasing threats of deportation may compromise the quality of self-reported legal data such that it is not fit for use, which in turn would limit the capacity of public health data to report on the effects of legal status in times when it may matter most.

The CHIS has consistently measured legal status through direct questions of naturalized citizenship and legal permanent residency since 2001. Meanwhile, the immigration enforcement context has changed drastically. The number of deportations per year – roughly 159 thousand in 2003 – had more than doubled by 2012 at over 407 thousand. Over the next four years this figured substantially declined to roughly 240 thousand in 2016. This dissertation evaluates the quality of self-reported legal status in CHIS and reports on the prevalence of severe psychological distress of adolescents with an unauthorized parent over time.

The first paper, *When we ask, do they answer? Item-nonresponse to questions of citizenship and immigration status in the California Health Interview Survey,* examined nonresponse to questions of legal status using paradata files from the California Health Interview Survey from 2001 to 2015. Non-response to questions regarding citizenship and LPR status were low overall, at 1.2% and 3.6% respectively, resulting in a total of 1.6% of all foreign-born CHIS participants with an ambiguous legal status due to nonresponse. Nonresponse to both questions

increased over time, however the largest change in nonresponse occurred between 2005 and 2007. Foreign-born CHIS participants who did not respond to legal status questions were more likely to be younger than 50 years old, live in poorer households and to not have a completed high school. Additionally, nonresponse was higher among participants who were surveyed in Spanish and lower among participants who were surveyed in an Asian language. The majority of nonresponse to both questions was attributable to Mexican-born participants, suggesting that these questions were comparatively more sensitive for Mexican-born participants relative to others.

Informed by differences in nonresponse, the second paper, *When they answer, should we listen? Examining the quality of self-reported citizenship and immigration status*, evaluated potential misreporting among Mexican-born CHIS participants for whom we interpreted the topic of legal status was most sensitive. Potential misreporting was evaluated with two complementary perspectives. The first perspective reported on the number and characteristics of participants who reported that they were neither a citizen or a permanent resident with a green card. These participants were considered to be unauthorized and to have participated fully with questions regarding their legal status. Roughly a quarter of the Mexican-born sample actively reported that they were neither a citizen or a permanent resident, and the demographic profile of the unauthorized population was similar to external estimates, which is evidence that self-reported data in CHIS was not significantly biased compared to other estimates.

The second perspective aimed to corroborate and characterize the validity of self-reported authorized statuses of either being a naturalized citizen or a permanent resident with a green card by repurposing indirect estimation strategies developed by demographers. First, a series of conditions – such as receipt of public benefits or having a job in the public sector – identified

those who are highly unlikely to be unauthorized. This step corroborated roughly 70% of participants who reported themselves to be a naturalized citizen and 40% of those who reported being a lawful permanent resident as not having misreported themselves as being authorized. The remaining participants were statistically compared with participants who reported that they were not a permanent resident with a green card, and predicted probabilities were generated to interpret as a similarity score. Overall, these predicted probabilities were lowest among self-reported naturalized citizens, higher among self-reported permanent residents, and highest among those who did not respond to the questions. Both the rate of corroboration and the distributions of predicted probabilities were largely consistent over time, suggesting that there had not been significant numbers of unauthorized participants who misreported themselves as being a naturalized citizen or a legal permanent resident.

Collectively, these results indicate that CHIS participants have been willing to and forthcoming in answering direct questions regarding their legal status, even in the context of increasing immigration enforcement between 2001 and 2012. These findings are consistent with speculation that private or university sponsored surveys would elicit favorable data quality compared to government surveys and empirical work evaluating the quality of self-reported legal status in the Los Angeles Family and Neighborhood Survey as well as the Survey of Income and Program Participation. These results are innovative in that they are the first to examine data quality over time and serve as an important foundation on which to begin applied research regarding the health and wellbeing of children with an unauthorized parent using CHIS data.

In the third paper, *Severe Psychological Distress Among Latino Adolescents with an Unauthorized Parent*, the mental health of Latino Californian adolescents was characterized by the prevalence of severe psychological distress. Latino adolescents with an immigrant mother

were significantly less likely to report severe psychological distress compared to adolescents with native born mothers, however this protective effect was not observed among adolescents with immigrant fathers. When considered jointly, the mental health of "children of immigrants" was not significantly different than that of Latino children of two US born parents, masking the significant protective effect observed among immigrant mothers. Disaggregating immigrant parents by legal status revealed important differences in adolescent mental health. In multivariate models, adolescents with an unauthorized father were significantly more likely to report severe psychological distress, whereas adolescents with an unauthorized mother were less likely to report severe psychological distress. Similar to the effects regarding nativity, these findings offset one another when considered jointly, masking separate significant effects.

**Limitations**

A fundamental limitation in this evaluation of data quality is that the participant's true legal status is never actually known – rendering these results as inherently predictive as opposed to a true validation study. This limitation was mitigated through comprehensive descriptions of response behavior, including descriptions of participants who did not respond, participants who reported the most legally high-risk answer, and by corroborating participants who reported an authorized status. This perspective, which already augments previous quality assessments which do not aim to corroborate self-reported authorized status, is further strengthened by the repeated measurement over time. By comparing all indicators of response behavior to the previous cycle, descriptive results have more context and are better positioned to signal changing response behavior.

A second limitation is that the survey questions directly measure naturalized citizenship and legal permanent residency status. While citizenship and LPR status are important attributes

of legal status, they do not directly measure unauthorized status. There are an estimated 13.1 million foreign-born individuals who are neither a citizen or an LPR, of which 84% (11.0 million) are estimated to be unauthorized.[11] However, an estimated 98% of Latinos who are neither a citizen or an LPR are unauthorized.[12] This high correlation allows for the interpretation that Latino CHIS participants who report that they are neither a citizen or an LPR are in fact an unauthorized person who has fully participated with questions regarding legal status. However, this also results in greater specification error among foreign-born individuals who are not Latino.

Working with the assumptions that 11.0 million unauthorized individuals represents 84% of all non-citizen non-LPRs,[11] and that 8.2 million unauthorized Latino individuals[13] represents 98% of non-citizen non-LPR Latinos,[12] we can infer that 2.8 million unauthorized non-Latino individuals represents 60% of the 4.7 million non-citizen non-LPR individuals who are not Latino. As a result, non-citizen non-LPR status can be considered an adequate proxy (84%) for unauthorized status for the general foreign-born population, a good proxy (98%) for unauthorized status for foreign-born Latinos, but a poor proxy (60%) for unauthorized status among foreign-born people who are not Latino.

A third limitation has to do with the imprecision in measurement of immigration enforcement over time. Across different reports, the number of deportations in a given year can vary. Part of this due to the fact that the source data are never static, and even official reports from Department of Homeland Security will update numbers for previous years. While changes are not drastic, they do present challenges in identifying the inflection points in trends over time. Additionally, the number of deportations per year is likely an imperfect measure of the experienced threat of immigration enforcement. Increased backlogs in immigration court could result in substantial time between the initial arrest and ultimate deportation, or deportation could

come at the completion of a lengthy jail sentence. It is also unclear how closely related the subjective perception of threat matches the objective number of deportations. In light of this, deportations – and their general trends over time – is an interpretable and accessible measure regarding immigration enforcement and likely reflects overall perceptions of threat.

**Future Research and Policy Implications**

In January 2017, President Trump issued an executive order which has fundamentally changed current immigration enforcement.[14] The American Academy of Pediatrics issued a statement in response warning that children who live in fear that their parent could be deported is a form of toxic stress which could have life-long health consequences.[5] In California, health care providers have reported that since the 2016 General Election, children in immigrant families are exhibiting increased symptoms of anxiety and depression and that diagnosed disorders have increased as well.[15] In light of these events, the issue regarding whether surveys can provide timely, representative data on the health consequences of immigration enforcement on children in immigrant families, and whether children with an unauthorized parent may be particularly vulnerable. Like before, survey data will only be positioned to help to the extent that we are willing to ask questions regarding legal status, and whether respondents are willing to them.

The Trump administration has changed immigration and enforcement policies in several substantive ways. Through a variety of mechanisms, this order expanded enforcement priorities to include noncitizens with any criminal history as well as those considered to be a threat to public safety. As an example, the order called for increased use of expedited removals which allows immigration officers to deport non-citizens without typical due-process procedures such as a hearing before a judge.[16] In addition to increasing the legal vulnerability of noncitizens, the order called for increased immigration enforcement officers both at the border and the interior,

and reestablished partnerships with state and local jails through reinstating Secure Communities Program and increase the number of 287(g) agreements.

Under this new directive – which grants the Department of Homeland Security unprecedented latitude in enforcement – the Secretary John Kelly issued a memorandum to immigration officers to take enforcement actions against all "removable immigrants encountered".[17] This was later followed by the dissolution of discretionary legal statuses including Temporary Protected Status for individuals from certain countries as well as the popular Deferred Action for Childhood Arrivals.[18] The Trump administration's willingness to separate families was also brought into relief with their highly public and unpopular "zero tolerance" policy.[19] Collectively, these developments have likely made the topic of legal status as highly sensitive, which may in turn may in turn raise concern that self-reported legal status would be misused for immigration enforcement.

Whether CHIS can adequately measure legal status under this political environment remains to be seen. In addition to serving as an important proof-of-concept, the research presented throughout this dissertation provides an empirical baseline of response behavior and data quality over nearly two decades. It will be important to evaluate the response behavior of CHIS data in 2017 and onward as they become available using the strategies enumerated here. Pragmatic questions such as: Are more people not answering the question and what are the characteristics of those who refused to answer? What proportion of respondents identify as a citizen, LPR, or non-LPR, and do they resemble participants who reported these statuses before? What proportion of participants who reported an authorized status can be corroborated by logic edits, and do predicated probabilities indicate differences compared to previous years? Having

these indicators established will make future assessments of data quality more timely and evidence based.

Because the quality of self-reported data is dependent on the respondent's willingness to disclose and their confidence that data would not be misused, it is instructive to review contemporary debates regarding the collection of citizenship and how data are legally protected from misuse. In March of 2018, the Department of Justice announced the intention to include a question regarding citizenship in the 2020 decennial census.[20] This announcement drew sharp criticism from academics[21] and immigrant advocates as well as several lawsuits challenging the constitutionality of this action.[22,23] Criticisms were founded again on the sensitivity of the question and expected response behavior, specifically that including a question of citizenship would reduce participation rates of immigrants. This is thought to result in an undercount of both immigrants as well as racial/ethnic minority groups overall, which in turn would underrepresent these populations in a data source which is central to political representation and allocation of federal funding.

Data collected by the Census Bureau are protected by Title 13 of the United States Code, which prohibits the use of personal information being used against respondents by other government agencies.[24] However, census data were abused when personal information including names and addresses of Americans of Japanese heritage were used to identify individuals who were sent to internment camps during World War II.[25,26] More recently, the Census Bureau provided information to the Department of Homeland Security regarding the Arab-American population in response to the terrorist attacks of September 11th, 2001.[27] This later example of cooperation between the Census Bureau and other federal agencies is legal, as Title 13 protects against individual-level disclosure but not sharing of aggregated data, even if made available at

specific geographic levels. The planned citizenship question in the 2020 decennial census is positioned to provide estimates of the non-citizen population at the block-level, and there are no legal protections to bar cooperation between the Census Bureau and the Department of Homeland Security.

Legal protections of data collected in public health surveys

Data collected by health surveys are also protected by several legal safeguards.[28] Federal health surveys conducted on behalf of the Center for Disease Control are subject to the Protection of Human Subjects of Title 45 of the Code of Federal Regulations as well as the Privacy Act of 1974. Additionally, Section 308(d) of the Public Health Service Act prohibits the use of identifiable information for purposes other than those explicitly stated at the time of consent. Notably, federal health surveys such as the National Health Interview Survey ask participants foreign-born participants whether they are a U.S. citizen.

Participants of research conducted outside of the federal government are also protected by various legal protections.[29] Institutional Review Boards are tasked with ensuring that risks to subjects are minimized and that adequate provisions are in place to protect research participants, including maintaining their confidentiality. Still, there are concerns about forced disclosure of research data by means of subpoena.[30] Researchers outside of the federal government can apply for a Certificate of Confidentiality from Department of Health and Human Services agencies, which protects researchers from being compelled to disclose research data in "any Federal, State, or local civil, criminal, administrative, legislative, or other proceeding".[31] In commentary regarding collecting legal status specifically, researchers are advised to acquire a Certificate of Confidentiality to offer the highest levels of legal protections to their research participants.[32]

While Certificates of Confidentiality offer strong legal protection above and beyond standard protocols, they do not offer absolute protection nor have they been fully tested in the courts.[33] In the limited number of court cases with a reported use of Certificates of Confidentiality, there have been differences in judicial interpretation, particularly in regards to what information is considered to be identifiable.[34] Scholars and advisors to the Department of Health and Human Services have identified means of strengthening the legal protections of Certificates of Confidentiality, such as educating Institutional Review Boards about their use and proper response to disclosure requests and expanding protections to cover non-identifiable research data.[34,35]

**Conclusion**

Population surveys are an important component of public health surveillance; however, progress is necessary to more fully incorporate immigrants and their families. The results presented in this dissertation demonstrate that legal status measured by direct questions regarding citizenship and legal permanent residency status in the California Health Interview Survey is of high quality and fit for use. Further, these data reveal significant heterogeneity in the risk of severe psychological distress among Latino adolescents in immigrant families. These findings add to a small but growing empirical base that support the measurement of legal status in population health surveys, as well as demonstrates that these questions add value to research related to children in immigrant families. As the saliency and sensitivity of legal status changes over time, it will be important to simultaneously consider the quality of self-reported legal status and the potential health consequences at the individual and family level. Population based outcomes for children of immigrant parents require a commitment from survey leaders to include relevant questions and methodological scrutiny to address response behavior and data quality.

**References**


1. A Profile of U.S. Children with Unauthorized Immigrant Parents. migrationpolicy.org. http://www.migrationpolicy.org/research/profile-us-children-unauthorized-immigrant-parents. Published January 11, 2016. Accessed June 18, 2016.
2. Yoshikawa H, Suárez-Orozco C, Gonzales RG. Unauthorized Status and Youth Development in the United States: Consensus Statement of the Society for Research on Adolescence. *J Res Adolesc*. 2017;27(1):4-19. doi:10.1111/jora.12272
3. National Academies of Sciences E. *The Integration of Immigrants into American Society*.; 2015. doi:10.17226/21746
4. U.S. Government Accountability Office. *Estimating the Undocumented Population: A Grouped Answers Approach to Surveying Foreign-Born Respondents*. Washington, D.C.: U.S. GAO; 2006. http://www.gao.gov/products/GAO-06-775. Accessed June 29, 2015.
5. AAP Statement on Protecting Immigrant Children. https://www.aap.org/en-us/about-the-aap/aap-press-room/pages/aapstatementonprotectingimmigrantchildren.aspx. Accessed March 19, 2018.
6. Artiga S, Dec 13 PUP, 2017. Living in an Immigrant Family in America: How Fear and Toxic Stress are Affecting Daily Life, Well-Being, & Health - Issue Brief. *Henry J Kais Fam Found*. December 2017. https://www.kff.org/report-section/living-in-an-immigrant-family-in-america-issue-brief/. Accessed March 21, 2018.
7. *The Effect of Hostile Immigration Policies on Children's Mental Health*. Los Angeles, CA: The Children's Partnership & The California Immigrant Policy Center; 2017. http://www.childrenspartnership.org/wp-content/uploads/2017/03/The-Effect-of-Hostile-Immigration-Policies-on-Childrens-Mental-Health.pdf.
8. Lee FS, Heimer H, Giedd JN, et al. Adolescent mental health—Opportunity and obligation. *Science*. 2014;346(6209):547-549. doi:10.1126/science.1260497
9. Kessler RC, Amminger GP, Aguilar-Gaxiola S, Alonso J, Lee S, Ustün TB. Age of onset of mental disorders: a review of recent literature. *Curr Opin Psychiatry*. 2007;20(4):359-364. doi:10.1097/YCO.0b013e32816ebc8c
10. National Research Council (US) and Institute of Medicine (US) Committee on the Prevention of Mental Disorders and Substance Abuse Among Children, Youth, and Young Adults: Research Advances and Promising Interventions. *Preventing Mental, Emotional, and Behavioral Disorders Among Young People: Progress and Possibilities*. (O'Connell ME, Boat T, Warner KE, eds.). Washington (DC): National Academies Press (US); 2009. http://www.ncbi.nlm.nih.gov/books/NBK32775/. Accessed June 28, 2018.
11. López G, Radford J. Facts on U.S. Immigrants, 2015. *Pew Res Cent Hisp Trends Proj*. May 2017. http://www.pewhispanic.org/2017/05/03/facts-on-u-s-immigrants/. Accessed December 10, 2017.
12. Livingston G. Hispanics, Health Insurance and Health Care Access. *Pew Res Cent Hisp Trends Proj*. September 2009. http://www.pewhispanic.org/2009/09/25/hispanics-health-insurance-and-health-care-access/. Accessed December 10, 2017.
13. Passel JS, Cohn D. Overall Number of U.S. Unauthorized Immigrants Holds Steady Since 2009. *Pew Res Cent Hisp Trends Proj*. September 2016. http://www.pewhispanic.org/2016/09/20/overall-number-of-u-s-unauthorized-immigrants-holds-steady-since-2009/. Accessed July 29, 2017.

14. Executive Order: Enhancing Public Safety in the Interior of the United States. The White House. https://www.whitehouse.gov/presidential-actions/executive-order-enhancing-public-safety-interior-united-states/. Accessed June 5, 2018.
15. Boulevard 811 Wilshire, Angeles S 1000 L, Avenue C 90017 P 213 341 1222 F 213 293 1483 455 M, NW, Washington #255, F: 202.429.0974 D 20001 P 202 429 0033. Healthy Mind, Healthy Future. *Child Partnersh*. http://www.childrenspartnership.org/priorities/healthy-mind-healthy-future/. Accessed June 26, 2018.
16. A Primer on Expedited Removal. American Immigration Council. https://www.americanimmigrationcouncil.org/research/primer-expedited-removal. Published February 3, 2017. Accessed April 15, 2018.
17. John Kelly. Memorandum from John F. Kelly, Homeland Security Secretary: Enforcement of the Immigration Laws to Serve the National Interest. February 2017. https://www.dhs.gov/sites/default/files/publications/17_0220_S1_Enforcement-of-the-Immigration-Laws-to-Serve-the-National-Interest.pdf.
18. Sarah Pierce, Andrew Selee. *Immigration under Trump: A Review of Policy Shifts in the Year Since the Election*. Washington, D.C.: Migration Policy Institute; 2017. https://www.migrationpolicy.org/research/immigration-under-trump-review-policy-shifts.
19. Exclusive: Nearly 1,800 families separated at U.S.-Mexico border in... *Reuters*. https://www.reuters.com/article/us-usa-immigration-children-exclusive/exclusive-nearly-1800-families-separated-at-u-s-mexico-border-in-17-months-through-february-idUSKCN1J42UE. Published June 11, 2018. Accessed June 26, 2018.
20. Secretary Wilbur Ross. Reinstatement of a Citizenship Question on the 2020 Decennial Census Questionnaire. March 2018. https://www.commerce.gov/sites/commerce.gov/files/2018-03-26_2.pdf.
21. A citizenship question on the 2020 census would be bad for public health. STAT. https://www.statnews.com/2018/04/13/citizenship-question-2020-census-public-health/. Published April 13, 2018. Accessed June 4, 2018.
22. Wines M, Baumgaertner E. At Least Twelve States to Sue Trump Administration Over Census Citizenship Question. *The New York Times*. https://www.nytimes.com/2018/03/27/us/census-citizenship-question.html. Published April 3, 2018. Accessed June 4, 2018.
23. Becerra X, Padilla A. Citizenship question on 2020 census may result in undercount. *San Francisco Chronicle*. https://www.sfchronicle.com/opinion/openforum/article/Citizenship-question-on-2020-census-may-result-in-12783055.php. Published March 26, 2018. Accessed June 4, 2018.
24. US Census Bureau CHS. Privacy & Confidentiality - History - U.S. Census Bureau. https://www.census.gov/history/www/reference/privacy_confidentiality/. Accessed June 4, 2018.
25. William Seltzer, Margo Anderson. Census Confidentiality under the Second War Powers Act (1942-1947). In: New York, New York; 2007.
26. Minkel JR, Minkel JR. Confirmed: The U.S. Census Bureau Gave Up Names of Japanese-Americans in WW II. Scientific American. https://www.scientificamerican.com/article/confirmed-the-us-census-b/. Accessed June 4, 2018.

27. Clemetson L. Homeland Security Given Data on Arab-Americans. *The New York Times*. https://www.nytimes.com/2004/07/30/us/homeland-security-given-data-on-arab-americans.html. Published July 30, 2004. Accessed June 4, 2018.
28. About NCHS - Confidentiality. https://www.cdc.gov/nchs/about/policy/confidentiality.htm. Published May 8, 2018. Accessed June 4, 2018.
29. Anderson EE. Ethical Considerations in Collecting Health Survey Data. In: *Health Survey Methods*. Wiley-Blackwell; 2014:487-511. doi:10.1002/9781118594629.ch19
30. Wolf LE, Zandecki J. Sleeping Better at Night: Investigators' Experiences with Certificates of Confidentiality. *IRB Ethics Hum Res*. 2006;28(6):1-7.
31. Certificates of Confidentiality: Background Information. https://humansubjects.nih.gov/coc/background. Accessed June 4, 2018.
32. Carter-Pokras O, Zambrana RE. COLLECTION OF LEGAL STATUS INFORMATION: CAUTION! *Am J Public Health*. 2006;96(3):399. doi:10.2105/AJPH.2005.078253
33. Beskow LM, Dame L, Costello EJ. Certificates of Confidentiality and the Compelled Disclosure of Research Data. *Science*. 2008;322(5904):1054-1055. doi:10.1126/science.1164100
34. Wolf LE, Patel MJ, Williams Tarver BA, Austin JL, Dame LA, Beskow LM. Certificates of Confidentiality: Protecting Human Subject Research Data in Law and Practice. *J Law Med Ethics J Am Soc Law Med Ethics*. 2015;43(3):594-609. doi:10.1111/jlme.12302
35. hhs.gov. Attachment B: Recommendations on Certificates of Confidentiality. HHS.gov. https://www.hhs.gov/ohrp/sachrp-committee/recommendations/2014-july-3-letter-attachment-b/index.html. Published March 18, 2016. Accessed June 5, 2018.