Title: State policy variation in Medicaid/CHIP expansion and family structure among children of immigrants

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Abstract

The 2009 Children's Health Insurance Program Reauthorization Act (CHIPRA) granted states the ability to expand Medicaid/CHIP eligibility to lawfully residing immigrant children who had lived in the U.S. for fewer than five years, which increased health insurance coverage among first-generation immigrant children in general. However, previous research has not examined whether the policy change had varying effects on the health insurance coverage and health among children of immigrants in different family structures. This is an important omission, as different levels of family resources may exacerbate or alleviate challenges that immigrant families face when obtaining coverage. Using data on a 51,536 children sample between the ages of 0-17 from the National Survey of Children's Health (NSCH) from 2007 and 2011, this study examined the relationship between state variation in the expansion of Medicaid/CHIP and health insurance coverage, health care service utilization, and health among children in single and cohabiting parent families of different immigrant generations. Using Difference-in-Difference-in-Differences (D-D-D) estimation guided by Andersen's (1995) Behavioral Model, this study estimated average changes in outcomes in states that expanded eligibility before and after CHIPRA among married-, cohabiting-, and single-parent families of different immigrant generations.

This study found that first-generation children of single and cohabiting parents residing in eligibility expansion states had the greatest gains in overall and public health insurance coverage through Medicaid/CHIP expansion, and the policy change had positive spillover effects on overall health insurance coverage among second-generation children in single-parent families. The study also found that the policy change was significantly associated with improved general health and dental health among children of immigrants. However, the study did not find evidence that policy treatment was associated with children's health care service utilization, a result that requires further research. Despite the fact that 18 states still have not expanded eligibility to immigrant children in the 5-year waiting period as of July 2017, current efforts by other states should serve as a positive example for non-expansion states. Findings from this study are salient in the midst of the ongoing debate about the ACA and the reauthorization of CHIP.

Introduction

The restriction of public health insurance benefits on lawfully residing immigrant children in their first five years of residency in the U.S. initiated by 1996 welfare reform created disparities in health insurance coverage and subsequent health care use between children of immigrants (especially first-generation children who are foreign-born with foreign-born parents) and children of nonimmigrants (Balcazar et al., 2015; Graefe, Hasanali, De jong, & Galvan, 2015). Although the 2009 Children's Health Insurance Program Reauthorization Act (CHIPRA) granted states the ability to expand Medicaid/CHIP benefits to the lawfully present immigrant children in the 5-year waiting period (Centers for Medicaid & Medicare, 2016), only 32 states and the District of Columbia (D.C.) have participated in expansion of eligibility (The Centers for Medicaid and Medicare, 2017; Department of Health & Human Services, 2012; Department of Health and Human Services, 2014; National Immigration Law Center, 2015).

Models of access to health care may help identify how various social and individual factors facilitate or hinder access to necessary health care among children of immigrants. This study applies Andersen's (1995) Behavioral model, a leading model used to explain access to health care among the immigrant population (Akresh, 2009; Aroian, Wu, & Tran, 2005; Johnson, Carroll, Fulda, Cardarelli, & Cardarelli, 2010; Miltiades & Wu, 2008; Siddiqi, Zuberi, & Nguyen, 2009). One insight developed from the Behavioral model is that state variation in Medicaid/CHIP expansion may have varying effects on the wellbeing of certain groups of immigrant families who are more vulnerable to limited access to health care. One group at particular risk in this regard may be first-generation children of immigrants in cohabiting- and single-parent families (Capps, 2005; Landale et al., 2011), who may face low levels of family resources in addition to challenges associated with their immigrant status. Accordingly, this

study examines how immigrant status and family structure interact to affect health insurance coverage, health care service utilization, and subsequently health outcomes among children of immigrants in single- and cohabiting-parent families and how these outcomes compare to children of U.S.-born parents

Background

Behavioral model by Andersen (1995)

Evolving through four rounds of incremental revisions since 1960, the Behavioral model (Andersen, 1995) suggests that access to health care is a function of the influence of the national health care system, a predisposition by people to use health care services, factors that enable or impede such use, and people's need for care. Using a system perspective, the core tenet of the model predicts access to health care as a product of the interplay among the predisposing, enabling, and need factors (Andersen, 1995). Predisposing factors refer to the demographic and social characteristics of individuals or families, such as immigrant status, marital status, and ethnicity (Andersen, 1995). Enabling factors include personal and family resources that promote or inhibit access to health care such as health insurance and family income, and need factors refer to perceived need or evaluated need for health care, which includes symptoms of illness, low-birthweight, and mental illness (Andersen, 1995).

Over time, the model was revised to include an external environmental factor which recognizes the important influence of the health care system and health policy as a determinant of health care use (Andersen, 1995). The role of the environmental factor is a key policy issue, as researchers and policymakers are often interested in understanding the effects of health policies on utilization of health care services (Andersen, 1995). Health outcomes were also added to the

model as a final product of the aforementioned factors as well as a product of health care service utilization, which is particularly important for health policy and health reform (Andersen, 1995). The core tenets of the model draw attention to a variety of factors and to the policy environment in particular. This paper will focus on how the policy environment interacts with key predisposing factors (immigrant status and family structure) to affect children's health insurance coverage, health care utilization, and health outcomes. This paper will explain each of these elements in the following sections.

The 1996 Welfare Reform and Public Health Insurance

The 1996 welfare reform prohibited lawfully residing first-generation immigrant children from receiving Medicaid/CHIP benefits in addition to other federally-funded human and health services for their first five years of residency in the U.S. (National Immigration Law Center, 2015), which created large disparities in health insurance coverage between low-income children of immigrants and nonimmigrants (Balcazar et al., 2015; Capps, 2005; Flores & Tomany-Korman, 2008; Graefe et al., 2015;). These disparities are notable because health insurance coverage could enable or disable health care service use and subsequently influence health outcomes (Andersen, 1995), as coverage is critical to accessing needed health care services (Blewett, Johnson, & Mach, 2010; Institute of Medicine, 2001). Because the majority of immigrant families' incomes are below 400% of the federal poverty level (FPL) (Migration Policy Institute, 2016), restricting access to Medicaid and CHIP has had a substantial impact on their health insurance coverage rates. In 2009, over 30% of the 12 million lawful permanent residents in the U.S. were uninsured (Capps, Rosenblum, & Fix, 2009) and represented more than 10% of the uninsured in states with a high concentration of the immigrant population (e.g., New York, Texas, and Florida) and 23% of the uninsured in California (Capps et al., 2009).

Given the disparities introduced by Welfare Reform, some states endeavored to increase coverage rates among immigrant children. Fifteen states including D.C. used state-only funds to cover first-generation children in the 5-year waiting period (Blewett et al., 2010; Migration Policy Institute, 2016). However, the coverage varied dramatically across states and many were more restrictive than Medicaid or CHIP in terms of benefits, coverage duration, and eligibility cutoff (Blewett et al., 2010; Migration Policy Institute, 2016).

State variation in Medicaid/CHIP eligibility expansion

In an effort to increase coverage rates among children in low-income families, the Children's Health Insurance Program Reauthorization Act (CHIPRA) was enacted in 2009. This policy allowed states to craft their own health care delivery system through additional funding, incentives, improved enrollment, renewal, outreach, and administration strategies (Centers for Medicaid & Medicare, 2016). Importantly, as part of CHIPRA, the Immigrant Children's Health Improvement Act eased the 1996 welfare reform restrictions, granting states the ability to expand Medicaid/CHIP benefits to immigrant children in the 5-year waiting period (Centers for Medicaid & Medicare, 2016). As of August 2017, 33 states including D.C. had expanded the program eligibility to cover lawfully residing low-income immigrant children irrespective of duration of residency in the U.S., whereas 18 states had elected not to expand eligibility (See Appendix 1 for a list of participating and nonparticipating states) (The Centers for Medicaid and Medicare, 2017; National Immigration Law Center, 2015).

State variation in Medicaid/CHIP benefits has produced geographic and temporal variation in insurance coverage among immigrant families. The Behavioral model (Andersen, 1995) suggests that such disparities might be compounded or mitigated by other key determinants of health insurance coverage and health care utilization like demographic and social

characteristics among immigrant families, which are predisposing factors that create further risk for poor access to health care and health outcomes.

Immigrant generation and challenges associated with immigrant status

A predisposing factor that may have substantial implications for access to health care of children of immigrants is immigrant generation. Children in different immigrant generations may face differing vulnerabilities in accessing health care through challenges associated with immigrant status (Andersen, 1995). Historically, first-generation children have had substantially lower levels of health insurance coverage rates than children of U.S.-born parents and second-generation children of immigrants, who were born in the U.S. with foreign-born parents (Capps et al., 2005; Tseng, 2004; Flores & Tomany-Korman, 2008). This is partly due to the fact that foreign-born parents' employment is heavily concentrated in industries such as the service sector and construction and in geographic areas where employers are less likely to make coverage available (Schur & Feldman, 2001). Furthermore, foreign-born parents often work at small businesses where work-related coverage is less common and more costly (Schur & Feldman, 2001). Meanwhile, a large proportion of first-generation mothers are unemployed and thus without access to employer-based insurance (Capps et al., 2005). Undocumented parents are mostly ineligible to purchase insurance coverage through employment or public programs, further lowering rates of insurance coverage among immigrants (Capps et al., 2005). Moreover, limited language proficiency and unfamiliarity with the U.S. health care system among first-generation families make it more difficult to secure coverage in general (Tseng, 2004; Flores & Tomany-Korman, 2008).

Compared to first-generation, second-generation immigrant families tend to experience fewer health care barriers. Second-generation children are born as U.S. citizens, and families are

more acculturated with higher levels of English proficiency, SES, and familiarity with the U.S. health care system (Burgos, Schetzina, Dixon, & Mendoza, 2005; Suro & Passel, 2003). Their rates of work-related health insurance coverage are also comparable to those of U.S.-born families (Schur & Feldman, 2001). However, second-generation families can contain family members of different legal statuses (Hudson & Abdus, 2015), for example when U.S-born children reside with parents and sibling who are temporary resident or undocumented. These mixed-status families tend to treat authority with caution due to fears about deportation, which often discourages them from applying for public health insurance or purchasing private health insurance for their U.S.-born eligible children (Hudson & Abdus, 2015).

As expected, children of U.S.-born parents (those who are third-generation or higher) have far higher rates of health insurance coverage than both first- and second-generation children (Balcazar et al., 2015). Unlike first- and second-generation children, children of U.S.-born parents are not affected by policy restrictions or legal status issues that limit the receipt of public health insurance or other social services (Saloner et al., 2014).

Family structure and different levels of family resources

The second key predisposing factor that might create particular risk for children of immigrant families, but which has so far been mostly overlooked in the literature, is family structure. Because children are dependent on their parents to obtain access to health care, family structure may influence the ability of parents to meet children's needs. For instance, children of immigrants residing with single or cohabiting (co-residing but unmarried) parents in different immigrant generations may experience differing levels of insurance coverage.

Evidence has shown that children in cohabiting- and single-parent families are disproportionately uninsured and far less likely to have private health insurance than children

with married parents (Bass & Warehime, 2011; Blackwell, 2010; Bramlett & Blumberg, 2007). This is partly due to single- and cohabiting-parent families' tendency to have lower levels of both employment and full-time employment, resulting in lower rates of employer-sponsored health insurance (Schur & Feldman, 2001). Furthermore, children in such families are less likely to utilize routine medical and dental visits (Bass & Warehime, 2011). These trends in health insurance and utilization are concerning because these children also have higher rates of acute and chronic health issues, such as injuries, asthma, and overweight/obesity, compared to children in married-parent households (Blackwell, 2010; Bass & Warehime, 2011; Gorman & Braverman, 2008; McConley, 2011; Moncrief et al., 2013; Schmeer, 2012).

In understanding disparities in child outcomes by family structure, researchers agree that family structure impacts child outcomes through different levels of parental human and financial resources (Thomson & McLanahan, 2012). According to research, families with married parents generally have higher incomes and employment rates (Sigle-Rushton & McLanahan, 2002; Thomas & Sawhill, 2005; Ziol-Guest & Dunifon, 2014), generating resources that are linked to positive outcomes for children (Thomson & McLanahan, 2012). Conversely, because of the presence of fewer income earners and relatively unstable home environments, cohabiting- and single-parent families are more likely to experience factors associated with negative outcomes for children, such as financial insecurity, parental stress, and less parent-child time (Brown & Rinelli, 2010; Kenney, McLanahan, 2006; Thomson & McLanahan, 2012; Ziol-Guest, 2009). Thus far, previous research has speculated that limited financial resources available to cover children's health care cost and less flexibility in parental time to attend to their children's health care may be linked to lower health insurance coverage and health service use among children in

single- and cohabiting-parent families (Bass & Warehime, 2011; Bramlett & Blumberg, 2007; CDC, 2010, 2007; Gorman & Braverman, 2008).

Importantly, family structure could matter especially for the health insurance coverage and access to health care of immigrant children, whose families tend to be highly interdependent and reliant on family cohesion as a survival strategy to manage the aforementioned challenges associated with immigrant status (Flores & Tomany-Korman, 2008; Landahle et al., 2011; Tseng, 2004). Thus, in addition to the health care challenges embedded in single- and cohabiting-parent households in general, a lack of full parental human and financial capital due to the absence of a parent or unstable parental involvement could mean less successful defense mechanisms against challenges associated with immigrant status for children. As a result, this could make immigrant children living with single or cohabiting parents more vulnerable to poor outcomes, including ill health.

The interaction between family structure and immigrant generation

Incorporating findings of previous research into the tenets of Andersen's model (1995), it could be predicted that state variation in Medicaid/CHIP benefits for lawfully residing recent immigrant children could produce varying levels of health insurance coverage for immigrant children across different family structures. These differing levels of health insurance coverage would then affect levels of utilization of health care services and subsequent health outcomes.

Specifically, one would expect that first-generation children in single- and cohabiting-parent families would be the least likely to have health insurance coverage, due to the aforementioned high levels of challenges associated with their immigrant status compounded by low average levels of family resources. At the same time, second-generation children in single- and cohabiting-parent families might have a lower level of health insurance coverage than

married-parent families, while still having higher coverage rates than first-generation children, because they face fewer challenges. Lastly, children of U.S.-born single and cohabiting parents may have lower health insurance coverage rates than their counterparts with married parents, but higher coverage rates than children of immigrants in single- and cohabiting-parent families as they do not face challenges in obtaining health insurance coverage. Finally, CHIPRA removed a major institutional impediment to gaining insurance coverage among first-generation children which at the same time may alleviate the financial and employment challenges that cohabiting- and single-parent families face when securing health insurance coverage. Thus, one might speculate that under the eligibility expansion initiated by CHIPRA, first-generation children in single- and cohabiting-parent families would maximally benefit from the policy intervention, while second-generation children in single- and cohabiting-parent families may indirectly benefit from the policy intervention through its outreach efforts to immigrant communities. Gains in coverage would be unlikely among children of U.S.-born single and cohabiting parents, because the relevant portions of CHIPRA specifically targeted immigrants.

Previous research has documented that Medicaid and CHIP expansion generally increased immigrant children's health insurance coverage (Schwartz, Chester, Lopez, & Popp, 2016; Heintzman et al., 2017). Although more research is necessary, Saloner and colleagues (2014) found that in states that extended insurance coverage by removing the 5-year waiting period for Medicaid/CHIP, foreign-born immigrant children living in poverty had a 24.5 percentage point higher rate of insurance coverage and significantly fewer unmet health needs. Another study documented that public insurance benefits improved overall access to health care among first-generation children though substantial disparities between immigrant and nonimmigrant children's health care access persist (Graefe et al., 2015). However, there has been

a significant lack of attention to the importance of family structure among immigrant families in relation to health insurance coverage and the varying effects of CHIPRA. Furthermore, previous research has overlooked health outcomes in examining the effects of the CHIPRA eligibility expansion.

Research question and hypotheses

Given these limitations and based on the theoretical framework (Andersen, 1995) as well as the review of relevant literature summarized above, this study sought to answer the following research question: What is the relationship between state policy variation in the expansion of Medicaid/CHIP and health insurance coverage among children in single- and cohabiting-parent families of different immigrant generations?

Based on this question and the review of literature above, the study had three specific aims: 1) to estimate policy effects initiated by CHIPRA on public and overall health insurance coverage among children of immigrants in cohabiting-and single-parent families, 2) to further examine whether the policy change affected utilization of health care services and general health status that are closely tied to health insurance coverage among children of immigrants in different family arrangements, and 3) to investigate whether the effects of the policy changes were limited only to first-generation children in single- and cohabiting-parent households (the most likely beneficiaries of the policy change), or whether effects also extended to second-generation children. As suggested above, the study hypothesized that the expansion of Medicaid/CHIP would have positive effects on health insurance coverage, utilization of health care services, and health among children of immigrants in single- and cohabiting-parent families in states with eligibility expansion compared to their counterpart children in non-expansion states. Further, the study hypothesized that the effects would be most pronounced among first-

generation children, while the policy change would not affect children of U.S.-born parents irrespective of family type. By focusing on various family structures and separating the sample into different immigrant generations in relation to the study outcomes, this study builds on previous research (Saloner et al., 2014), which has demonstrated the effects of CHIPRA expansions on coverage among immigrant children. This study contributes to the empirical body of scholarship on family structure among children of immigrants using a nationally representative sample of children and expanding the scholarship on CHIPRA.

Methods

Data

This study used the National Survey of Children's Health (NSCH) data, a cross-sectional and nationally representative survey, conducted by the Center for Disease Control and Prevention (CDC, 2017). In 2003, 2007, and 2011, the NCSH collected data from over 100,000 households. This study took advantage of the NSCH's state-specific information and measures on children's health insurance coverage, use of health care services, and health, as well as its large sample of children of immigrants. These measures enabled an estimation of policy effects on children of immigrants in states that expanded eligibility. The analysis included data from 2007 and 2011, which allowed for comparison of outcome variables before and after the policy was enacted in 2009.

Sample

Among 187,319 children in the NSCH data with at least one parent in the 2007 and 2011 waves, this study included 58,673 children under the age of 18 in families with household incomes below 200% of FPL at the time of survey. Household income under 200% of FPL indicated that the household was likely to be eligible for Medicaid and CHIP in the prior year.

The final model included 51,536 children who had valid information on measures of immigrant generation, family structure, and potential confounders included in this study (described below). Because the NSCH collected data on routine dental checkups and dental health status among children between the ages of 1-17, the study relied on a sub-sample of 48,294 children for the analysis of these two outcomes (described below). It is noteworthy that because the NSCH did not collect data in 2007 on length of residence in the U.S. and the legal status of children, this study could not separate undocumented children and children with permanent residence among the sample of first-generation children[1].

Measures

Policy Treatment. This study classified states on whether or not they expanded Medicaid/CHIP to lawfully residing immigrant children in the 5-year waiting period, using a dichotomous indicator (1=yes, 0=no). This study also created a dichotomous indicator for time periods: pre-policy (2007) and post-policy (2011) treatment.

Family structure and Immigrant generation. This study categorized children by immigrant generation focusing on the nativity of children and parents, using a conventional approach (e.g., Harker, 2001) to define different immigrant generations (U.S.-born families for U.S.-born children with U.S.-born parents, second-generation for U.S.-born children with foreign-born parents, and first-generation for foreign-born children with foreign-born parents). In addition, children in each generation were grouped into three family structures (married-, cohabiting-, and single-parent families), emphasizing marital and residential status in

[1] Due to the lack of data, this study may underestimate the impact of eligibility expansion on lawfully residing immigrant children in the 5-year waiting period. Due to that NSCH data do not contain information on legal status of first-generation children, it is also possible that the result could be influenced by the size of the undocumented children population.

categorizing family structure, an approach which has been adopted by previous studies (e.g., Berger, 2004; Bzosetek & Beck, 2011).

Outcome variables. As products of interactions among population characteristics and environmental factors in the model (Andersen, 1995), this study examined children's a) public and overall health insurance coverage, b) utilization of routine medical and dental care services, and c) general physical and dental health status as outcome variables.

Health insurance coverage. Public health insurance coverage was measured as a dichotomous variable to indicate "1" if a child had Medicaid or CHIP, or "0" if a child did not at the time of the survey. Overall health insurance coverage was measured with a dichotomous indicator (1=yes, 0=no) of whether a child had any type of health insurance.

Utilization of routine health care services. Parent respondents were asked whether a focal child visited a health care professional for preventive medical services in the past 12 months (1=yes, 0=no). Likewise, parents provided information on whether the child visited a dentist for preventive services in the past 12 months, coded dichotomously (1=yes, 0=no). The question on the dental routine care visit was only asked for children ages between 1-17.

General health status. Parent respondents reported their child's overall health condition as a) excellent or very good, b) good, or c) fair or poor. The responses were dichotomized into those reporting 1=excellent/very good health versus those reporting 0=good/fair/poor health. Likewise, a measure for a child's dental health status was created as a dichotomous measure to indicate 1=excellent/very good dental health status versus 0=good/fair/poor dental health.

Covariates. This study controlled for a number of potential confounders which could affect the relationship between the policy treatment and outcome measures. The variables were selected and grouped based on Andersen's (1995) model. Predisposing factors (demographic

characteristics and social structure) included child's race, gender, age, parent's education, and the number of children in the household. Enabling factors (resources aiding the use of care) included family income level and parents' work status. Need factors (individuals' need for care) were measured with parents' overall physical health status. This study also included state-level potential confounders to account for any changes across states that might confound the estimation of independent effects of CHIPRA on the study outcomes. These measures included time-varying measures of states' welfare spending, immigrant population percentages, and unemployment rates in the survey years, obtained from the Center for Immigration Studies (2007), Pew Research Center (2013), and the Bureau of Labor Statistics (2016), respectively. All models included state fixed effects (state-specific indicators) to control for any relevant unobserved, time-invariant state characteristics.

Analysis

The main aim of this study was to examine estimates of eligibility expansion initiated by CHIPRA on insurance coverage, health care utilization, and health status among children of immigrants in cohabiting- and single-parent families. This study first examined family and child characteristics on the full sample and by immigrant generation. To estimate the independent effects of CHIPRA on outcomes, this study used Difference-in-Difference-in-Differences (D-D-D) estimation, a quasi-experimental analytic technique frequently used to examine the effects of policy treatment on the outcomes between policy treatment groups and control groups and between subgroups (Angrist & Pischke, 2009; Murnane & Willett, 2010). A basic Difference-in-Difference (D-D) set-up measures the effects of a treatment (often policy change) on an outcome by comparing average change in the outcome for a group that is exposed to a treatment (in this case, states adopting eligibility expansions) with changes in outcomes for a control group that is

not exposed to the treatment (states that did not expand eligibility) before and after the treatment. By adding a third difference (comparison), D-D-D estimation further compares average changes in outcomes among subgroups between treatment and control groups. The result of this method is to generate an estimate of the policy change, by controlling for changes over time in control groups and among subgroups that are not likely to be affected by the policy (Angrist & Pischke, 2009; Murnane & Willett, 2010).

The analyses consisted of two parts that reflect the objectives of the study. The first aimed to document the broad impact of Medicaid/CHIP eligibility expansion among first- and second-generation children in relation to their health insurance coverage, health care utilization, and importantly health outcomes which have been overlooked by previous research in examining the impact of the eligibility expansion. Though it mirrors previous research (Saloner et al., 2014), conducting this first set of analyses is necessary because it may elucidate overall changes in outcomes by immigrant generation. This will serve as a precursor for the second set of analyses, which focus on examining differential impacts of eligibility expansion by family structure in each immigrant generation.

As discussed, the first part of the analysis focused on differences in outcomes among children of different immigrant generations. The first difference examined outcome differences among children in expansion states before (in 2007) and after (in 2011) the implementation of CHIPRA. The second difference compared the differences in outcomes between children in expansion states and non-expansion states, controlling for state-level characteristics between expansion and non-expansion states. The third difference compared the differences in outcomes among children in different immigrant generations, using children of U.S.-born parents as a comparison group to account for any trend in the dependent variables among low-income

families in general. Thus, the D-D-D approach for the first part of the analysis provided estimates of the independent effects of the policy treatment on the outcomes among first- and second-generation children in expansion states after policy treatment, after differencing out changes over time for states that did not adopt the eligibility expansion and changes for children of U.S.-born parents who are not the likely targets of the expansion. Consistent with the typical implementation of D-D-D models, the study used a linear regression model and included all possible interaction terms among the indicators: a) time periods, b) state participation in CHIPRA, and c) immigrant generation. In these models, the coefficient of the three-way interaction term indicates the policy effects on the study outcomes among first- and second-generation children in expansion states after the policy treatment.

For the second part of the analysis, this study specified a separate D-D-D model for each immigrant generation group to investigate the effects of eligibility expansion among children of immigrants in cohabiting- and single-parent families, which is the main focus of this study. Firstly, this study separated the sample into different immigrant generation groups (first-generation, second-generation, and U.S.-born families). In each separate group, the first difference examined study outcomes among children during pre- and post-CHIPRA periods in expansion states. The second difference compared differences in outcomes between children in expansion states and in non-expansion states, differencing out changes over time in the dependent variables in non-expansion states for children who are not likely to be affected by the policy. Finally, the third difference compared changes in the study outcomes among children in single-, cohabiting-, and married-parent families during the same time period between eligibility expansion states and non-expansion states. Here, children of married parents were used as the comparison group to account for any trends in the dependent variables that affected children in

all households of a particular immigrant generation. As before, analyses for this second stage were implemented using linear regression including indicators for time, state participation in CHIPRA, and family structure, along with all the possible interactions among these indicators. As above, the coefficient of the three-way interaction term for time, state CHIPRA participation, and family structure was examined in each model to determine the effects of CHIPRA. With this approach, this study could compare results across the models to determine if the policy effect was different for children in cohabiting- and single-parent families in different generations[2].

Sampling weights that adjust for survey non-response and unequal selection probabilities are provided in the NSCH public-use dataset (NSCH, 2017) to generate population-based estimates. Sampling weights were applied in all analyses that this study present. This study accounted for the clustering of observations within states. The SAS version 9.4 statistical software package was employed for all analyses.

Results

Table 1 presents family and child characteristics for the pooled sample and by immigrant generation. Approximately 19% of children in the sample were children of immigrants, and of these 83% were second-generation and 17% were first-generation children. About half of the children lived in married-parent families, while 35% of children resided in single-parent families and 13% resided in cohabiting-parent families. The proportions of married-parent households were lower with later generations. Overall health insurance coverage rates increased with

[2] D-D-D estimation relies on the key assumption that outcome trends for the treatment and control groups remain unchanged over time up to a policy change (and thus that changes observed during the period under study were not reflective of trends already in motion). Because the NSCH was only administered in 2003, 2007, and 2011, it was not possible to establish trends using these data. Thus, in order to ensure that the differences in outcomes after the implementation of CHIPRA were plausibly due to the policy change alone, I examined the national rates of overall and public health insurance coverage rates (as a specific outcome and determinant of subsequent outcomes in the study) among children in different immigrant generations from 2002 through 2008 using data from National Health Interview Survey (NHIS) (See Appendix 2, Figure 1 – Figure 2).

generation from 53% in households with first-generation children, to 87% in second-generation households, and to 92% in U.S.-born parent households. Children appeared to have better general physical and dental health as well as higher rates of routine health and dental care checkups with later generations.

Table 2 presents full results from the first set of D-D-D analyses by immigrant generation after controlling for individual and state-level covariates. First-generation children in eligibility expansion states experienced a significant increase in public insurance coverage (coefficient=0.085, $p<0.0001$) and overall health insurance coverage (coefficient=0.120, $p<0.0001$) compared to first-generation children in states that did not, which is consistent with previous research (Saloner et al., 2014). However, the current study did not find significant policy effects on second-generation children's public or overall health insurance coverage. Importantly, this study found that the general health status of first-generation children in expansion states also significantly improved (coefficient=0.086, $p<0.05$) after the implementation of CHIPRA. However, while dental health status among first-generation children increased after the expansion, the effects were not statistically significant ($p<0.10$). Interestingly, this study also found that second-generation children had significantly improved dental health in states that expanded eligibility (coefficient=0.047, $p<0.05$) in comparison to their counterparts in non-expansion states. Nevertheless, this study did not find a significant association between the policy intervention and outcomes related to utilization of routine care services among children of immigrants.

Table 3 shows results from the second part of the analysis, which focused on family structure in each immigrant generation. Table 3 highlights only main results; full results are available upon request. This study found that among first-generation families, eligibility

expansion resulted in increases in overall health insurance coverage for children in single- and cohabiting-parent families (coefficient=0.225, $p<0.05$ and coefficient=0.281, $p<0.05$, respectively). First-generation children of cohabiting parents residing in expansion states also experienced a significant increase in public health insurance coverage (coefficient=0.207, $p<0.05$) compared to their counterparts in non-expansion states. Although public health insurance coverage appeared to have increased among first-generation children in single-parent families, the effect was not statistically significant ($p<0.10$).

In second-generation families, the results showed that the probability of health insurance coverage for children of single parents in expansion states improved by 0.146 points compared to counterparts children in non-expansion states ($p<0.0001$). However, this study did not find significant differences in routine medical/dental care use or general health/dental health status among children of immigrants across family structure. Lastly, as anticipated, children of single and cohabiting U.S.-born parents in expansion states did not experience any significant policy effects compared to their counterpart groups in non-expansion states.

Figures 1 and 2 display the results of a parallel trend assumption test conducted to ensure the accuracy of D-D-D estimation. Using the National Health Interview Survey data from 2002-2008, the test examined changes over time in trends of overall health insurance coverage rates for different immigrant generations during the pre-CHIPRA period. The parallel trend assumption test was conducted to rule out the possibility that the improvement in insurance coverage was the product of larger trends, as opposed to the effects of the policy intervention. The test results shown in Figure 1 indicate that the trend of overall health insurance coverage by immigrant generation appeared to be parallel and unchanged over time, satisfying the assumption. According to the graph shown in Figure 2, second-generation children's public

insurance coverage rates appeared to have fluctuated over time; however, the average differences in rates were less than 5%. Thus, the trend was assumed to be moderately parallel over time.

Discussion

This study was the first to examine the effects of eligibility expansion initiated by CHIPRA on health insurance coverage among children of immigrants in various family structures. The study's findings confirmed that the Medicaid/CHIP expansion improved both public and overall health insurance coverage among first-generation children in expansion states (Graefe et al., 2015; Saloner et al., 2014;). Additionally, this study found that the policy treatment was associated with improved general health status among first-generation children as well as improved dental health among second-generation children, who were not a direct target population of the policy intervention.

Most importantly, this study discovered that the children of immigrants in single- and cohabiting-parent families significantly benefited from the Medicaid/CHIP expansion after adjusting for individual and state-level characteristics, supporting the study's hypothesis. Overall, public and overall health insurance coverage among first-generation children in single- and cohabiting-parent families substantially improved in the 33 eligibility expansion states compared to similar children in non-expansion states. Overall health insurance coverage also significantly improved among second-generation children in single-parent families. This improvement may reflect CHIPRA's outreach to immigrant communities and its simplification of enrollment processes based on children's citizenship status (Center for Medicaid and Medicare, 2016). At the same time, the provision of subsidized coverage, in conjunction with the ACA's provision of tax credits to assist families with the cost of health insurance (Artiga & Damico, 2017; Centers for Medicaid & Medicare, 2016), might have contributed to the

significant increases in overall health insurance coverage among children of immigrants in vulnerable families. As expected, this study found no evidence that this policy intervention affected children of U.S.-born parents in any family type, who were not targeted by this immigrant-specific policy. In summary, these findings supported the study's hypotheses.

Contrary to the study's hypothesis, and despite the fact that CHIPRA appears to have increased health insurance coverage, the study did not find any significant association between the eligibility expansion and children's utilization of health care services or health status for children of immigrants living in single- or cohabiting-parent families. This may be because of barriers to health care service utilization that are not affected by increased health insurance coverage, such as limited English proficiency or unfamiliarity with the U.S. health care system. For example, a routine care visit requires that parents make appointments, take time off from work and transport their child to a care site, and manage follow-up appointments. Fulfilling these tasks may be particularly challenging for a single parent with language barriers, even after having received the necessary health insurance coverage under CHIPRA to afford the appointment (Flores & Tomany-Korman, 2008; Schwebel et al, 2005; Yun et al., 2013). Thus, the underutilization of health care services observed in this study might reflect the double barriers for children living in immigrant families with cohabiting or single parents. While requiring further study, this aspect of the results is broadly consistent with recent research suggesting that children of immigrants continue to underutilize care services even after expansions in coverage under the ACA (Leininger & Levy, 2015; Singh, Yu, & Kogan, 2013). Meanwhile, as suggested by Andersen's model (1995), utilization of health care services affects health outcomes. Thus, the fact that CHIPRA appears not to have increased health status for children living in single- and cohabiting-parent families could be the result of underutilization of

preventative care. Moreover, it should be noted that standard errors (SE) were mostly larger for the analyses in regard to first-generation children groups than those related to second-generation or children of U.S.-born parent groups. This may be due to the relatively small sample size of first-generation children in single- and cohabiting-parent families, which might not have provided sufficient statistical power to detect true differences. At the same time, this finding may indicate that there is a possibility of improvements of health among children with married parents, which future research should examine.

While this study provides unique insight into the impact of eligibility expansion among children of immigrants in various family structures, there are limitations to note. As previously mentioned, this study could not consider length of U.S. residence or legal status of first-generation children due to a lack of data. Therefore, the results should be interpreted with caution, considering possible underestimation of impact of eligibility expansion on lawfully residing immigrant children in the 5-year waiting period. The size of the population of undocumented children could have influenced the results in unanticipated ways.

Implication

The findings of this study identified that family structure is an important predictor of health insurance coverage among children of immigrants. As shown, CHIPRA's eligibility expansion likely increased health insurance coverage among children of immigrants in different family structures. First-generation children of single and cohabiting parents had the greatest gains in health insurance coverage through Medicaid/CHIP expansion, while the policy intervention had positive spillover effects on health insurance coverage among second-generation children in single-parent families. Longitudinal studies should examine whether these improvements in coverage are continued past the two years following CHIPRA's

implementation studied here. The findings of the study suggest that non-expansion states should consider expanding CHIPRA as an effective tool to improve insurance coverage for children of immigrants. The findings also suggest that health insurance coverage disparities between children of different nativities and family structures could be alleviated as more states expand CHIPRA. Lastly, these recommendations must be considered in context of the rapidly changing the U.S. political climate. Policy makers must focus on challenging anti-immigrant policies that threaten the well-being and health of children of immigrants, as well as maintaining and expanding programs such as CHIPRA, in promoting health insurance coverage for the children of immigrants.

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Table 1. Family and Child Characteristics on Full sample and by Immigrant Generation					
		Full sample (N=51,536)	Children of US-born parents (n=39,449)	2nd Generation (n=9,953)	1st Generation (n=2,134)
Variable name	Range	Mean (SD)			
Public health insurance coverage	0-1	.604	.605	.662	.341
Overall health insurance coverage	0-1	.896	.922	.873	.532
Used routine medical care in the past 12 months	0-1	.829	.840	.824	.666
Used routine dental care in the past 12 months	0-1	.730 (n=48,134)	.738 (n=36,926)	.728 (n=9,152)	.597 (n=2,121)
General health status is excellent/very good	0-1	.788	0.835	0.653	.558
Dental health status is excellent/very good	0-1	.631 (n=48,134)	0.683 (n=36,926)	0.490 (n=9,152)	.359 (n=2,121)
Family structure					
Married	0-1	.528	.493	.631	.693
Cohabiting	0-1	.127	.115	.179	.119
Single	0-1	.344	.392	.190	.188
Child's Race					
White, non-Hispanic	0-1	.496	.616	.115	.520
Black, non-Hispanic	0-1	.147	.174	.059	.712
Hispanic, non-Hispanic	0-1	.242	.954	.720	.738
Other	0-1	.113	.114	.106	.139
Child's gender					
Male	0-1	.516	.514	.524	.534
Female	0-1	.483	.486	.476	.466
Child's age	0-17	8.35 (5.27)	8.56 (5.30)	8.18 (5.23)	
Parent's overall health					
Excellent/very good	0-1	.515	.539	.450	.389
Good/fair/poor	0-1	.484	.461	.550	.616
Parent's overall mental health					
Excellent/very good	0-1	.619	.633	.584	.534
Good/fair/poor	0-1	.380	.367	.416	.466
Parents' education level					
Less than High school	0-1	.204	.139	.410	.444
High School Graduate	0-1	.325	.343	.270	.253
More than High School	0-1	.470	.518	.320	.303
Household member worked in the past years for 50 weeks or more	0-1	.761	.776	.721	.683
Family income					
<100% FPL	0-1	.429	.400	.510	.594

100%-199% FPL	0-1	.570	.600	.490	.406
Number of kids in the household					
1	0-1	.343	.356	.301	.310
2	0-1	.340	.333	.368	.360
3	0-1	.190	.184	.211	.216
4 or more	0-1	.124	.126	.120	.114

Table 2. Full results from D-D-D analysis on the study outcomes (N=51,536)						
	Public Health Insurance	Overall Health Insurance	Preventive Health Care Use	Preventive Dental Care Use	General Health Status	General Dental Health Status
	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
Natives†						
2nd Generation	-0.002 (0.020)	-0.001 (0.013)	-0.001 (0.017)	-.0260 (0.020)	0.011 (0.019)	0.047* (0.022)
1st generation	0.085*** (0.004)	0.120*** (0.025)	0.012 (0.033)	-0.031 (0.039)	0.086* (0.035)	0.070+ (0.041)
Child is White†						
Black	0.012 (0.008)	0.004 (0.004)	0.002 (0.007)	0.020* (0.008)	-0.076*** (0.007)	-0.068*** (0.009)
Hispanic	0.050*** (0.008)	-0.020*** (0.005)	0.013+ (0.007)	0.014+ (0.008)	-0.024** (0.007)	-0.032** (0.009)
Other	-0.089*** (0.007)	-0.009* (0.004)	-0.015* (0.006)	-0.017* (0.007)	0.019** (0.006)	0.034*** (0.007)
Child is male	-0.002 (0.004)	-0.006* (0.002)	-0.001 (0.003)	-0.017*** (0.004)	-0.014*** (0.003)	-0.030*** (0.004)
Child's age	-0.008*** (0.000)	-0.002*** (0.000)	-0.009*** (0.000)	0.025*** (0.000)	-0.004*** (0.000)	-0.011*** (0.000)
Parent's health is in Excellent/very good	-0.030*** (0.004)	0.003 (0.003)	-0.009* (0.004)	0.006 (0.004)	0.111*** (0.004)	0.111*** (0.005)
Parent has more than high school degree†						
High School Graduate	-0.008 (0.005)	0.031*** (0.003)	0.034*** (0.005)	0.034*** (0.006)	0.053*** (0.005)	0.042*** (0.006)
Less than High school	-0.080*** (0.006)	0.045*** (0.003)	0.059*** (0.005)	0.063*** (0.006)	0.081*** (0.005)	0.105*** (0.006)
Household member worked in the past years for 50 weeks or more	-0.074*** (0.005)	-0.007* (0.003)	0.002 (0.004)	0.005 (0.005)	0.026*** (0.004)	0.025*** (0.005)
Family income is 100%-199% FPL	-0.213*** (0.004)	-0.015*** (0.003)	-0.008*** (0.004)	0.018*** (0.004)	0.033*** (0.004)	0.033*** (0.005)
Number of kids in the household is 1†						
2	-0.004 (0.006)	-0.007* (0.003)	0.023** (0.006)	-0.005 (0.006)	0.000 (0.005)	-0.003 (0.006)
3	-0.005 (0.006)	-0.013** (0.003)	0.025*** (0.005)	-0.033*** (0.006)	0.000 (0.005)	0.016** (0.006)
4 or more	-0.002 (0.006)	-0.025*** (0.004)	0.020** (0.005)	-0.101*** (0.006)	-0.008 (0.006)	0.033*** (0.007)
State unemployment rates	0.003 (0.003)	0.002 (0.002)	-0.004 (0.002)	0.004 (0.003)	-0.001 (0.002)	-0.001 (0.003)

State welfare spending	-0.000*** (0.000)	0.000*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
% Immigrant population	-0.012 (0.007)	-0.006 (0.005)	-0.011+ (0.006)	0.005 (0.007)	-0.007 (0.007)	-0.014+ (0.008)

+ $p<.10$; *$p<.05$, **$p<.01$, ***$p<.001$
† reference group
The analyses controlled for all potential individual- and state-level confounders examined in this study and included state fixed effects

Table 3. Results from D-D-D by family structure for children in each generation							
		Public Health Insurance	Overall Health Insurance	Preventive Health Care Use	Preventive Dental Care Use	General Health Status	General Dental Health Status
Immigrant Generation	Family Structure	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
Children of US-born parents	Married Parent Families† n=19,452	Referent					
	Single Parent Families n=15,462	0.030+ (0.020)	-0.001 (0.011)	-0.009 (0.015)	-0.014 (0.019)	-0.019 (0.016)	0.019 (0.021)
	Cohabiting Parent Families n=4,535	-0.006 (0.028)	0.004 (0.016)	0.018 (0.022)	0.013 (0.029)	-0.039+ (0.023)	-0.040 (0.031)
2nd generation	Married Parent Families† n=6,279	Referent					
	Single Parent Families n=1,888	-0.063 (0.047)	0.146*** (0.037)	0.028 (0.040)	-0.063 (0.048)	0.025 (0.047)	-0.018 (0.052)
	Cohabiting Parent Families n=1,786	-0.050 (0.047)	0.028 (0.035)	-0.011 (0.039)	-0.050 (0.047)	-0.076+ (0.045)	-0.078 (0.052)
1st generation	Married Parent Families† n=1,479	Referent					

	Single Parent Families n=402	0.084+ (0.057)	0.225* (0.092)	-0.050 (0.103)	0.110 (0.102)	0.025 (0.103)	-0.063 (0.099)
	Cohabiting Parent Families n=253	0.207* (0.093)	0.281* (0.115)	-0.027 (0.127)	-0.138 (0.130)	-0.052 (0.131)	0.070 (0.113)

+ $p<.10$; *$p<.05$, **$p<.01$, ***$p<.001$

† reference group

The analyses controlled for all potential individual- and state-level confounders examined in this study and included state fixed effects.

Appendix 1.

Appendix 1. States participating in Medicaid or CHIP eligibility expansion to lawfully residing children and/or pregnant women as of July, 2017.		
State	**CHIP**	**Medicaid**
Alabama	Not Participating	
Alaska	Not Participating	
Arizona	Not Participating	
Arkansas		Children and pregnant women
California	Children	Children and pregnant women
Colorado	Children and pregnant women	Children and pregnant women*
Connecticut	Children	Children and pregnant women
Washington, D.C.***		Children and pregnant women
Delaware	Children	Children and pregnant women
Florida	Children	Children*
Georgia	Not Participating	
Hawaii***		Children and pregnant women*
Idaho	Not Participating	
Illinois	Children	Children*
Indiana	Not Participating	
Iowa	Children	Children
Kansas	Not Participating	
Kentucky	Children	Children*
Louisiana	Not Participating	
Maine	Children	Children and pregnant women
Maryland***		Children and pregnant women
Massachusetts	Children	Children and pregnant women
Michigan	Not Participating	
Minnesota	Children	Children and pregnant women
Mississippi	Not Participating	
Missouri	Not Participating	
Montana	Children	Children*
Nebraska	Children	Children and pregnant women*
Nevada		Children and pregnant women
New Hampshire	Not Participating	
New Jersey	Children and pregnant women	Children and pregnant women
New Mexico***		Children and pregnant women
New York	Children	Children and pregnant women
North Carolina	Children	Children and pregnant women*
North Dakota	Not Participating	
Ohio***		Children and pregnant women
Oklahoma	Not Participating	
Oregon	Children	Children*
Pennsylvania	Children	Children and pregnant women

Rhode Island	Children	Children
South Carolina	Not Participating	
South Dakota	Not Participating	
Tennessee	Not Participating	
Texas	Children	Children*
Utah	Children	Children*
Vermont***		Children and pregnant women
Virginia	Pregnant women** Children	Children and pregnant women*
Washington	Children	Children and pregnant women
West Virginia	Children	Children and pregnant women*
Wisconsin	Proposed	Children and pregnant women
Wyoming	Not Participating	Pregnant women
This table was created based on information from the Centers for Medicare & Medicaid Services (2017). *These States cover children in Medicaid up to age 19. **Virginia is using 1115 demonstration to cover pregnant women. ***These states are Medicaid/CHIP expansion programs.		

Appendix 2.

Figure 1. Trend in children's overall health insurance coverage rates by immigrant generation, National Health Interview Survey, 2002-2008

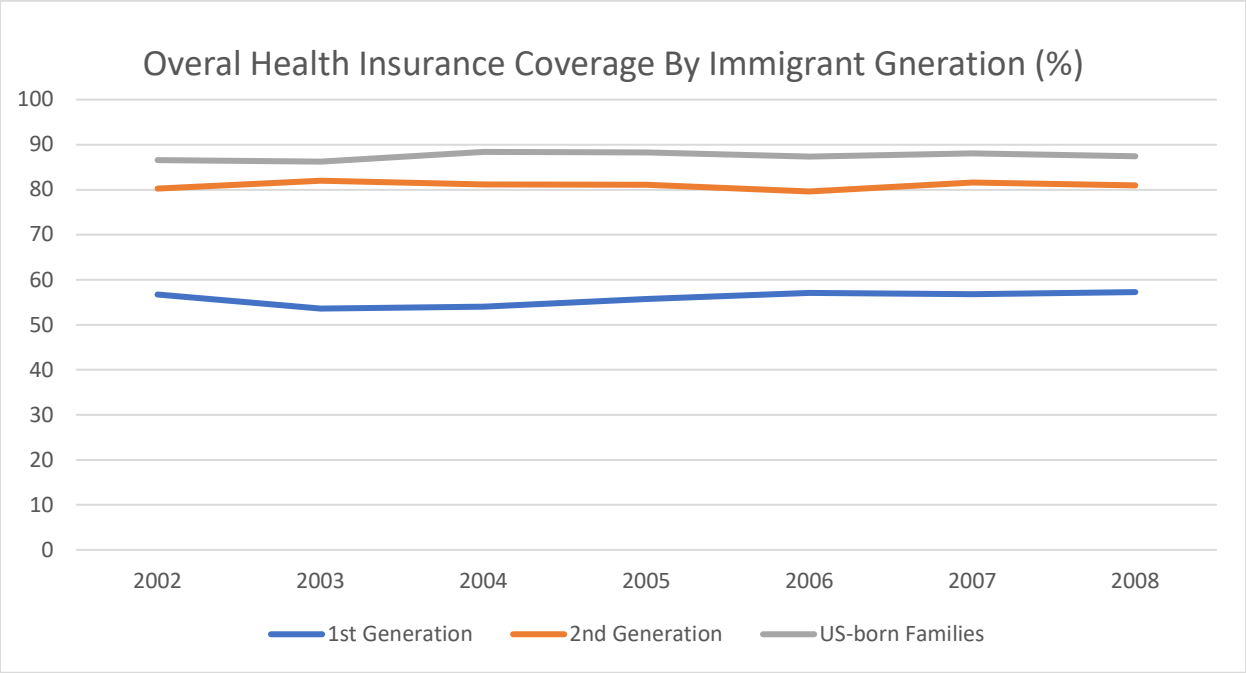

Figure 2. Rend in children's public health insurance coverage rates by immigrant generation, National Health Interview Survey, 2002-2008