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Birthweight of children of immigrants by maternal duration of residence in the United States

Julien O. Teitler [a,*], Nathan Hutto [a], Nancy E. Reichman [b]

[a] Columbia University, School of Social Work, 1255 Amsterdam Ave., New York, NY 10027, USA
[b] Robert Wood Johnson Medical School, Department of Pediatrics, 89 French St., Room 1348, New Brunswick, NJ 08908, USA

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ABSTRACT

A large literature on immigrant health in the U.S. has shown that immigrants tend to be healthier and live longer than both individuals who remain in their countries of origin and natives of their host countries who are of the same race or ethnicity. However, this immigrant health advantage appears to diminish with duration of residence in the U.S. Few studies of the effects of immigrants' exposure to the U.S. have focused on perinatal health. This study used three contemporary national datasets to describe patterns in infant birthweight by maternal duration of residence in the U.S. For both immigrants overall and Hispanic immigrants in particular, rates of low birthweight appeared to decline over the first few years in the U.S. and increase thereafter. This curvilinear association was robust across the three datasets and deviates somewhat from the prevailing notion that immigrant health declines monotonically over time. Additionally, we found no evidence that prenatal substance use increased with duration of residence in the U.S.

Introduction

A large literature on immigrant health in the U.S. has shown that immigrants tend to be healthier and live longer than both individuals who remain in their countries of origin and natives of their host countries who are of the same race or ethnicity (see Jasso, Massey, Rosenzweig, & Smith, 2004). However, this immigrant health advantage appears to diminish with duration of residence in the U.S. (e.g., Cho, Frisbie, Hummer, & Rogers, 2004; Goel, McCarthy, Phillips, & Wee, 2004; Uretsky & Mathiesen, 2007). Although the vast majority of studies investigating this issue have focused on U.S. populations, negative associations between duration of residence and health have also been found in Canada (e.g., McDonald & Kennedy, 2004; Newbold, 2005) and Australia (e.g., Chiswick, Lee, & Miller, 2008; Julian & Easthope, 1996).

Acculturation theory, which has dominated research on immigrant health trajectories, considers the interaction between one's culture of origin and that of the host country. Many scholars have described the acculturation process, noting that it is complex and not uniformly experienced (e.g., Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005; Portes & Rumbaut, 2001) and that it cannot be characterized by a single or simple measure (e.g., Berry, 2003). The process is assumed to be bi-directional, with no predetermined winner in the tension between the old and new cultures. Endpoints of acculturation can be the preservation of the culture of origin, acceptance of the new culture in lieu of the old, integration of the two cultures, or marginalization through rejection by members of either or both cultures. In practice, however, as evidenced by most indicators of acculturation used in the empirical literature (language acquisition, generational status, and age at immigration, all of which are highly associated with duration of residence in the host country), the process is assumed to follow a route of gradual acceptance of the new culture, with the protective effects of the country of origin dissipating over time (see Jasso et al., 2004). That is, the process is generally presumed to be monotonic and assimilative in nature.

Many studies of acculturation focus on individuals' health behaviors, finding that more acculturated immigrants engage in higher rates of drug use, alcohol abuse, cigarette smoking, and unhealthful eating patterns (see Lara et al., 2005). Others have considered pathways other than behavioral changes, hypothesizing that prolonged or cumulative exposure to discrimination or other potentially health-compromising social contexts takes a more direct toll on immigrants' health (Nazroo, 2001; Reijneveld, 1998; Singh & Siahpush, 2002; Uretsky & Mathiesen, 2007).

Studies on health declines among immigrants have focused primarily on adults, and those have focused primarily on Hispanics, who represent the largest immigrant subgroup in the U.S. Dey et al.

* Corresponding author. School of Social Work, 1255 Amsterdam Avenue Room 712, New York, NY 10027, USA. Tel.: +1 212 851 2376.
E-mail addresses: jot8@columbia.edu (J.O. Teitler), nathandavidhutto@gmail.com (N. Hutto), nancy.reichman@gmail.com (N.E. Reichman).

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(2006) reported that Hispanic immigrants living in the U.S. for fewer than five years have lower rates of obesity, hypertension, diabetes, and cardiovascular disease than Hispanic immigrants living in the U.S. for more than five years. Antecol and Bedard (2006) described similar patterns for self-reported general health and activity limitations among Hispanic immigrants, even when controlling for socioeconomic status; the patterns were less consistent among white immigrants and not apparent among black immigrants. Both of these studies used data from the National Health Interview Survey (NHIS), a large nationally representative study of the U.S. population. Kaestner, Pearson, Keene, and Geronimus (2009), using data from the National Health and Nutrition Examination Survey, found that 45–60 year old Mexican immigrants have lower allostatic load scores (biological markers of stress) upon arrival than U.S.-born Mexican Americans, non-Hispanic whites, and non-Hispanic blacks, and that this health advantage is attenuated with duration of residence in the U.S. (measured in 10 year increments).

Findings from the above studies and the broader literature are consistent with acculturation theory and suggest a monotonic association between duration of residence in the U.S. and poor health; that is, the longer immigrants have been in the host country (almost always the U.S., in studies to date), the worse their health. However, Jasso et al. (2004) uncovered a curvilinear association using the NHIS and considering self-rated health as well as seven different chronic conditions. Jasso and colleagues' finding, which is also consistent with acculturation theory in its general formulation, suggests that improvements in health occur among immigrants soon after arrival followed by steady deterioration after five years in the U.S. The authors found that the initial improvements in adult health do not appear to reflect language acquisition or changes in reference frames (i.e., initially comparing oneself to individuals in the country of origin but eventually using U.S. residents as the comparison).

Few studies of the effects of immigrants' exposure to the U.S. have focused on perinatal health. A simple look at U.S. natality statistics reveals clear evidence of the "epidemiologic paradox"—a term coined by Markides and Coreil (1986)—in the context of birth outcomes of foreign-born Hispanic (particularly Mexican) versus U.S.-born non-Hispanic white women. That is, birth outcomes of foreign-born Hispanic mothers are on par with, if not more favorable than, those of native-born non-Hispanic white mothers despite the relative socioeconomic disadvantages of the former as compared to the latter. Numerous studies have compared birth outcomes of foreign-born mothers to those of native-born mothers of the same race or ethnicity—arguably a more appropriate comparison—and have uniformly found the former to be more favorable than the latter (e.g., Cho & Hummer, 2001; David & Collins, 1997; Landale, Oropesa, & Gorman, 1999; Landale, Oropesa, Llanes, & Gorman, 1999; Singh & Yu, 1996).

As far as we know, only three studies to date have investigated associations between mothers' duration of residence and the health of their U.S.-born (or, in one case, Canadian-born) infants, despite the facts that: (1) some of the key behaviors thought to be affected by acculturation (e.g., diet and smoking) are important predictors of birth outcomes (in particular, birthweight), (2) the maternal-child link is potentially important for understanding patterns in immigrant health across generations, and (3) the share of children in the U.S. born to immigrant mothers is very large, with one quarter of births in the U.S. in 2008 taking place to women born outside of the 50 U.S. states or DC (Martin, Hamilton, Sutton, Ventura, Mathews, & Osterman, 2010).

Landale, Oropesa, and Gorman (2000), using pooled origin/destination data from the Puerto Rican Maternal and Infant Health Study, found that maternal duration of residence in the mainland U.S. is positively associated with infant mortality, controlling for an extensive set of individual and family characteristics. As such, their results are consistent with the general findings in the literature. While the focus on Puerto Ricans migrants is very interesting and important, the perinatal health profiles of this group stand in stark contrast to those of other Hispanics. In particular, even among those who self-report as white, Puerto Rican mothers have rates of low birthweight and infant mortality that are much higher than those of non-Hispanic whites and most other Hispanic subgroups (Reichman & Kenney, 1997). Therefore, findings vis-à-vis Puerto Ricans cannot be generalized to immigrants, Hispanic immigrants, or other Hispanic subgroups. Particularly relevant for the present study, the authors imposed a linear functional form on the association between duration of residence and infant mortality in their analyses (i.e., they included a continuous variable for years in U.S. in their model); as such, potential non-monotonic relationships between duration and infant mortality, such as those found by Jasso et al. (2004) for duration and adult health, may be obscured.

Urquia, Frank, Moineddin, and Glazier (2010) investigated the association between maternal duration of residence (in five year increments) and both preterm birth and small-for-gestational age using natality data from metropolitan areas of Ontario, Canada. They controlled for socioeconomic characteristics and found that duration of residence was independently associated with increases in preterm birth, but not in small-for-gestational age. Recent immigrants were at lower risk of preterm birth compared to a mostly Canadian-born population, but immigrants became at higher risk after 10 years of stay in Canada.

Ceballos and Palloni (2010), in a study of two urban community samples of Mexican-origin mothers, found a curvilinear association between duration and adverse birth outcome (defined as birthweight less than 2500 g *and* small-for-gestational age *and* less than 37 weeks gestation). Having spent 3 or fewer years or 13 or more years in the U.S. was associated with less favorable birth outcomes compared to having spent 4–12 years in the U.S. The authors were able to replicate the general finding using the National Survey of Family Growth (NSFG) Cycle V, for slightly different duration intervals (0–6 and 11+ years). While the study was based on clinic-based samples or retrospective reports of birth outcomes from the NSFG, used fairly crude duration intervals, and did not investigate duration effects specifically on birthweight, it is nevertheless informative and suggests that the association between duration in the U.S. and infant health is complex.

To date, no study has investigated associations between immigrant duration of residence in the U.S. and low birthweight using nationally representative data with fine-grained measures of duration of residence. The consideration of short duration intervals is critical given evidence that associations might not be monotonic. In this paper, we use three contemporary national datasets, two of which are nationally representative and the other of which is representative of births in large U.S. cities, to investigate associations between maternal duration of residence in the U.S. and their infants' birthweight. We investigate these associations for all immigrants as well as for Hispanic immigrants and when possible, Mexican immigrants. Disaggregating immigrant subgroups as much as possible is important, as there is evidence of heterogeneity in health behaviors within the U.S. immigrant population (e.g., Zsembik & Fennell, 2005).

We focus on the question of whether associations between duration and birthweight mirror those that have been found between duration and adult health. We also explore whether the associations between duration and birthweight are consistently negative as empirical research on acculturation has often assumed, or whether the relation is more complex, as is suggested by the findings of Jasso et al. (2004) for adult health in the U.S. Our goal is to describe patterns in birthweight by duration of residence rather than to uncover the mechanisms that explain those patterns. We