



The weight of inequalities: Duration of residence and offspring's birthweight among migrant mothers in Sweden



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ABSTRACT

In this study we assessed the effect duration of residence on the association between maternal origin and birthweight in Sweden. Considering sibling information, we also investigated how far the presence or lack of such an effect could be biased by the use of cross-sectional data, since there may be a selection among those mothers who decide to have a child soon after moving to the country (e.g. those with a more stable family situation). Using the Swedish Medical Birth Register for the period 1992–2012, we performed linear and multinomial regressions, multilevel linear regressions, and random effect meta-analysis. Offspring of foreign-born mothers were lighter on average (–120 g [–143,–60]) and had a higher risk of having low birthweight (RRR:1.70 [1.61,1.80]) compared to those with Swedish-born mothers. The variation of birthweight by duration of residence was small (less than 50 g) compared to the gradient found between countries grouped according to the human development index (HDI), where the difference between countries with low and very high HDI was of 105 g. Moreover, no clear pattern toward a convergence with the Swedish population was observed after nine years in the country, which was confirmed when we compared the between- and within-mother analyses by HDI categories. Overall, our results support the thesis that contextual early life conditions have an impact on adult health (reproductive health in this case) with consequences in the next generation that cannot be buffered by the situation experienced in the host country.

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1. Background

Studies on migration have shown that health outcomes vary by duration of residence in the host country (Antecol and Bedard, 2006; Norredam et al., 2014; Jatrana et al., 2014; Rivera et al., 2015; Urquia et al., 2010a; Lee et al., 2013; Sørbye et al., 2014; Teitler et al., 2015; Kwan and WC, 2007). In the absence of early-life forces, this evidence shows the plasticity of human nature under the influence of new social and natural environments. Evidence of effect modification by time spent in the host country is relevant for public health in order to define specific health care needs, but also for broader policy making, as it might serve to assess the health consequences of different political and social approaches toward migration.

In North America (Urquia et al., 2012; Teitler et al., 2012) the discussion regarding the role of the duration of residence revolves around the counter-intuitive evidence that newly arrived immigrants from developing countries tend to be healthier than the native population, a term coined the ‘healthy migrant paradox’ (Markides and Coreil, 1986). Furthermore, the suggestion that the health of migrants becomes similar to that of natives is implicitly interpreted as a natural process of becoming *indistinguishable* from the native population (i.e. the ‘convergence hypothesis’) (Antecol and Bedard, 2006), which may also lead to the conclusion that the origin plays a lesser role over time.

The effect of the duration of residence becomes a concern when immigrants’ health deteriorates to below the local population, as it signals the host environment as pathogenic (De Maio, 2010). This decline has been observed in many health conditions and illnesses and across several countries; for example, in relation to overweight/obesity (United States) (Antecol and Bedard, 2006), diabetes, breast cancer (Denmark) (Norredam et al., 2014), self-reported chronic conditions including cancer, chronic bronchitis,

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asthma, heart/coronary disease, high blood pressure, anxiety, circulatory conditions, arthritis and diabetes mellitus (Australia) (Jatrana et al., 2014), mental health (Spain) (Rivera et al., 2015), self-reported health (United States) (Lee et al., 2013), preterm (Canada) (Urquia et al., 2012), non-spontaneous preterm (Norway) (Sørbye et al., 2014), suicide (China) (Kwan and WC, 2007), psychotropic drug use (Sweden) (Brendler-Lindqvist et al., 2014), among others (De Maio, 2010). Exceptions to this pattern have also been documented, for example, in relation to tuberculosis, stroke, HIV/AIDS (Denmark) (Norredam et al., 2014), small-for-gestational age (Canada) (Urquia et al., 2010a) and acute myocardial infarction (Sweden) (Hedlund et al., 2007), for which no change with duration of residence has been observed.

Since becoming part of the host society is considered to be desirable (and it occurs with time), the fact that their health may be compromised by duration of residence has led scholars to define this apparent contradiction as ‘assimilation paradox’, ‘acculturation paradox’ (Urquia and Gagnon, 2011), ‘unhealthy assimilation’ (Antecol and Bedard, 2006) or ‘overshoot hypothesis’ (De Maio, 2010). Two main explanations have been put forward to explain the evidence that migrants’ health worsens over time. Firstly it has been argued that migrants adopt risky health-related behaviors (Antecol and Bedard, 2006; Bos et al., 2007; Pérez, 2002) and/or are exposed to discrimination (Vega and Amaro, 1994; Williams, 1999) with harmful consequences for their health status. Alternatively, health can decline over time as a consequence of an improvement in diagnosis due to a greater use of the health care system (Leclerc et al., 1994).

1.1. Duration of residence and birth outcomes

From a life course perspective, birth outcomes are of particular relevance since they inform about the health of the mother and the child, representing both reproductive outcomes of the former and predictors of the wellbeing of the latter (Rich-Edwards et al., 2002; Mishra et al., 2010; Kuh and Ben-Shlomo, 2004). Therefore, changes in birth outcomes by mother’s duration of residence could also have an impact on the health of the second generation.

Most studies looking at the association between duration of residence and health at birth have focused on outcomes derived from gestational age (mainly preterm). However, the patterns are not consistent across countries, which, in part, can be explained by the fact that they substantially vary in design, methods of analysis and/or period of study. For example, migrants in Canada showed a convergence pattern with the native population in relation to the risk of preterm births for up to ten years after arrival, but showed a higher risk there after (Urquia et al., 2010a). In Norway, duration of residence only modifies the risk of non-spontaneous preterm (Sørbye et al., 2014), showing a higher (and increasing) risk compared to those of the Norwegian-born population. In contrast, studies in Sweden showed that migrants arrive with higher risk/odds ratios (ORs) of preterm birth, but some do experience an initial improvement with the time spent in the country (Rasmussen and Claes, 1995; Khanolkar et al., 2015; Liu et al., 2014). Evidence of a moderate reduction of ORs for preterm birth was found in a study published in 1995 among migrants from Eastern Europe and Finland after 36 months of residence compared to Swedes (Rasmussen and Claes, 1995). A recent study showed that migrants who have been in Sweden for less than three years were at higher risk of delivering early preterm and post-term births compared to those with more than ten years (Khanolkar et al., 2015), but specific origins were not investigated. Moreover, war refugees with less than two years of residence in Sweden showed higher ORs of preterm and very preterm birth compared to those who spent two years of residence, however higher ORs of very preterm birth were

also found among those who had lived in the country for three to five years (Liu et al., 2014). These two latter studies (Khanolkar et al., 2015; Liu et al., 2014) did not use the native population as a reference category, which makes it difficult to test the convergence hypothesis.

In relation to the effect of maternal origin and duration of residence on offspring’s birthweight, two studies conducted in the United States showed a curvilinear association both in relation to birthweight (Teitler et al., 2012) and low birthweight (Teitler et al., 2012, 2015), with a systematic reduction of average birthweight (and an increase of low birthweight) during the first 11 years of residence that reverses afterwards. To the best of our knowledge, only one study in Sweden assessed the association between low birthweight and duration of residence (categorized as more-than or less-than 36 months) (Rasmussen and Claes, 1995) but no substantial changes were found. This result is consistent with a Canadian study that explored small-for-gestational-age and duration of residence (Urquia et al., 2010a).

1.2. Knowledge gaps and potential for improvements in the existing literature

Studies on the effect of duration of residence on migrant’s health have often overlooked birthweight, despite it having a number of methodological advantages compared to other outcomes. Birthweight is collected in population registers (which warrants representativeness) and consists of objective measures overcoming the limitations inherent to other health outcomes which strongly depend on the probability of their being diagnosed (i.e. through health care accessibility for chronic conditions) or on the accuracy of the estimation (i.e. gestational age). Nor is birthweight as culturally-dependent as other outcomes such as some mental health problems.

However, despite the above-mentioned strengths related to the outcome measure, there are also limitations associated to the study of birth outcomes in general that need to be addressed. Apart from the general drawback that affects all migration studies derived from under-reported out-migration, most studies on birth outcomes have been conducted using cross-sectional data, hence it is likely that compositional effects might dilute or intensify true duration effects (Vang et al., 2015). Cross-sectional data can lead to bias; for example, if there is a selection among those mothers who decide to have a child soon after moving to the country (e.g. those with a more stable family situation and/or socio-economic position) or among those who decide to stay longer (e.g. those with limited possibilities of returning). If we systematically compare differences in birthweight between different mothers without any attempt to evaluate their reproductive outcomes over time, we can over/underestimate the effect of the duration of residence. Previous demographic studies support this possibility as they show that the decision of being a mother depends on the place of origin and the reason for migration; work-related migrants tend to postpone reproduction more than those women who migrate for family reasons (Mussino and Strozza, 2012). Thus, differences by duration of residence would reflect compositional characteristics rather than true time effects.

A more general limitation also derives from the definition of the study population. Researchers have been encouraged to conceptualize the study population in line with the specific research question (Bradby, 2012). However, population-based research is largely constrained by the information available in the registers; therefore it is common that, depending on the national context, migration is approached via categories such as race and ethnicity (Hessol and Fuentes-Afflick, 2000), nationality (Speciale and Regidor, 2011) or country of birth (Juárez and Revuelta-Eugercios,

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