# Cultural persistence of health capital: evidence from European migrants

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Joan Costa-Font
Azusa Sato

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## Abstract

Culture is an under-studied determinant of health production and seldom measured. This paper empirically examines the persistence in the association between the health capital assessments of first and second-generation migrants with that of their ancestral countries. We draw on European data from 30 countries, including over 90 countries of birth and control for timing of migration, selective migration and other controls including citizenship and cultural proxies. Our results show robust evidence of cultural persistence of health assessments. Culture persists, rather than fades, and further, appears to strengthen over generations. We estimate a one standard deviation increase in ancestral health assessment increases first generation migrant’s health assessments by an average of 16%, and that of second generation migrants between 11% and 25%. Estimates are heterogeneous by gender (larger for males) and lineage (larger for paternal lineage).

JEL-Codes: I180, H230, Z130.

Keywords: assimilation, health, health assessments, cultural persistence, first generation migrant, second generation migrant.

*Joan Costa-Font*
*London School of Economics and Political Science (LSE)*
*London / United Kingdom*
*j.costa-font@lse.ac.uk*

*Azusa Sato*
*London School of Economics and Political Science (LSE)*
*London / United Kingdom*
*a.sato@lse.ac.uk*

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## 1. Introduction

Health status evaluations are employed as commonly used tools to assess cross-country health capital. Health assessments highly correlate with objective measures of health status (Bound, 1991), and have been used widely as a measure of health capital which is potentially less sensitive to genetics. Heiden (2015) shows that self-assessed health is correlated to historical, current, and future hospital records. However, such health assessments reflect, at least partially, cultural specific cues and judgements, and more generally, culturally specific reference points as culture contains potentially portable dimensions (e.g., beliefs and social norms, inertial health behaviour etc). To date, we know reasonably little about how culturally transmission of health capital takes place. Specifically, economics research has focused on documenting the effect of both language proficiency (Schachter *et al*, 2012) and generalised trust (Ljunge, 2014) on health. However, still we know little about the effect of culture on health. By culture we mean "differences in beliefs and preferences that vary systematically across groups of individuals separated by space" (Fernandez, 2008).

Without doubt, the most obvious way to estimate such cultural persistence is by drawing on large immigrant samples that are heterogeneous both in countries of ancestry and residence. If such information were available, it would be an ideal 'quasi-natural experiment'. This is even more so when examining second generation immigrants, given that they have been brought up under the institutions of their country of residence, and hence the effect of their ancestors culture can be isolated form that of the institutions of residence. This is especially the case after controlling for citizenship, as immigrant citizenship can explain differences in health outcomes and other wellbeing indicators. Hence, the association between health assessments and that of the individual's country of ancestry (or that of their

parents'), is akin to measuring *cultural persistence* (Fernandez and Fogli 2006; Luttmer and Singhal 2011). Documenting cultural persistence of health capital, especially when measured across generations, adds to the existing health economics literature which to date has focused on assimilation (Salant and Lauderdale, 2003). Assimilation studies typically face the problem of identifying the effect of local institutions as the country of destination is not established. Additionally, the assimilation literature has not reached consensus on whether 'health acculturation' actually takes place (Antecol and Bedard, 2006; Subedi and Rosenberg, 2014, Ljunge, 2016).

This paper investigates further the persistence in the portability of 'ancestor's culture' in explaining health capital. We estimate the association of health assessments of first generation migrants, and second generation migrants with those of their country of ancestry. Research on the cultural persistence of health capital goes against theories arguing that the transmission of human capital declines across generations (Becker and Tomes, 1986).

We take advantage of a rich data set containing data on worldwide (including European) migrants' health. Data from 30 different European member states are available, allowing us to control for compositional effects and heterogeneous origins[1]. Specifically, we examine the association between individual health assessments to the average health assessment of their country of origin for both first and second generation migrants over six waves of the European Social Survey (ESS). This allows us to identify the presence of cultural effects, taking into account a number of controls (e.g., citizenship, income etc) and immigrant's self-selection. Given that immigrants' own health assessments do not determine the mean health of the country of origin, the effect of average country of origin health assessment is not endogenous to the individual's assessment.

[1] As other studies have found (Ljunge, 2016), natives and immigrants' show similar characteristics in predicting health in such a heterogeneous dataset, with the exception of Muslim immigrants. We therefore control for religion.

In addition to estimating cultural persistence, we attempt to understand processes behind assimilation - which are often determined before adapting to host country values[2]. This refers to the effect of sample selection, given that migrants tend to differ from the rest of the population in key socio-economic dimensions. Paradoxically, immigrant health is often found to be better than natives at the point of immigration (Antecol and Bedard, 2005), hence assimilation to patterns of the country of residence cannot necessarily be assumed healthier or welfare improving. However, in the European context, this effect may be mitigated as populations are more homogenous and ethnic differences are less pronounced than in other parts of the world[3]. To control for potential selection problems, important health related characteristics of migrants need to be controlled for, to which we refer as 'wellbeing controls'. Another challenge is that migration is institutionally induced by different regulation, hence in addition to controlling for citizenship, we examine subsample of migrants from certain European countries.

Our identification strategy follows the the so-called 'epidemiological approach' (Fernandez and Fogli 2006; Luttmer and Singhal 2011) which allows us to isolate the effect of culture from institutions and address omitted variable bias (including biases from measures of health knowledge, parental health, and parental specific characteristics). Our contribution lies in measuring the persistence of assessments of ancestral paternal and maternal country of birth which avoids the problem of potential reverse causality, as the child's health evaluation cannot affect health evaluation in the father or mother's country of origin. Results are reported in standardised coefficients, to compare the mean across first and second generations.

[2] It is important to test whether selective migration and other economic factors explain assimilation.
[3] Assimilation is largely dependent on patterns of socialisation, to the extent that immigrants who network among themselves are shown to have reduced stress and improved self-esteem (Umberson and Montez 2010), but at the price of a slower rate of assimilation.

Focusing on other outcomes, earlier work explores beliefs across first and second generation immigrants. Alba and Nee, (1997 and Antecol (2000) find that cultural effects persist into the second generation. Similarly, Borjas (1992) finds that cultural persistence is strikingly higher for the second generation than for any further generation of immigrants. Lazear (1999) makes the case that the smaller the minority group the more likely it is an individual to assimilate Our empirical strategy will address the issues raised in previous research by examining the effect of time in the country of residence and minority status. Our results show very strong evidence of cultural persistence in the evaluation of health status. A one unit change in migrants' self-assessed health increases one's own self assessed health by 0.36 scale units (16%) irrespective of gender. The effect increases to 0.45 (or an average of 25%) on maternal lineage and 0.57 scale units (or an average of 25%) on paternal lineage. However, for second generation migrants, the effect is 0.24 scale units (or 11% on average) among maternal lineage and 0.32 scale units (or 14%) among paternal lineage. We run a number of robustness checks including potential differential effects by gender, the potential selection effect of migrants to EU countries, or those born in EU countries, and current residence location.

The structure of the paper is as follows. The next section provides the background. Section three addresses data and methods. Section four contains the results, followed by robustness checks and the final section concludes.

## 2. Migration and Culture

Migration is not a random process, but a costly one, and in many cases only healthy people are able to migrate. This gives rise to the so-called 'healthy immigrant effect', which argues that on average, migrants possess better health than native counterparts upon arrival (Antecol and Bedard, 2005, 2006, Palloni and Arias 2004). However, research outside the United States, and in Europe (where migrants move from and to many different countries) shows that migrant health does not differ much from that of natives, apart from Muslim migrants (Ljunge, 2016).

One explanation for the healthy dividend of migrants is argued to stem from common beliefs, which economics labels as 'culture'. Owusu-Daaku and Smith (2005) show that Ghanaian women who have moved to the UK uphold Ghanaian perspectives about health and illness while adapting to the British health system. That is, migrants come with 'protective cultural factors' towards healthier lifestyles (Scribner 1996). Consistently, some evidence show that a migrant's health advantage declines with time spent in-country (Deri 2003). Antecol and Bedard (2005) show that immigrants to the US are less likely to report poor health, however, assimilation to poor health (as opposed to good or average health) takes place within ten years of arrival. In the US the health advantage for Latin American populations declines the longer they stay in the country, a sign of unhealthy adaptation to increased stress (Kaestner et al. 2009).

Yet,other evidence finds that immigrants become healthier the longer they remain in the country (Jasso et. al. 2004). Given this mixed evidence, it is difficult to predict the direction of change in immigrant assessments of health capital over time that results from changes in circumstance, including health care access. This is explained by the idea that exposure to a new environment can cause immigrants to adopt native-born behaviours (such as, diet and exercise), although some evidence also shows that health advantages are lost in

childhood (Hamilton et al, 2011), and many health conditions worsen across generations (Mendoza 2009). Hence, an important gap in the literature is in understanding persistence in health capital assessments across generations. Similar studies have been carried out for other outcomes. For example, Luttmer and Singhal (2011) argue that culture is a strong determinant of redistribution preferences. By comparing immigrants' redistributive preferences with the average preferences of people in their birth countries, they find that immigrants from countries indicating high levels of preference of redistribution are more likely to vote for pro-redistributive parties.

## 3. Data and Empirical Strategy

### *3.1 Data*

We draw upon data from the European Social Survey, Waves 1-6, representing every two years between 2002 and 2012 inclusive. All datasets across waves were first merged and variables made consistent. The data includes 30 participating countries and the survey contains information about the respondent's country of birth and that of his/her father and mother. This allows us to collect information on over 90 countries and accordingly, individual level data can be matched with health measures constructed at the country level from the World Values Survey. Similarly, we can control for country of origin and residence country income (GDP per capita), mainly obtained from the World Bank database[4]. This strategy has been previously used by Lutmer and Singhal (2011) to study preference for redistribution. In our case, we have data on health assessment for all waves such that we are able to take advantage of variation in health assessments over time. However, unlike redistributive preferences, health measures are less reliant on changes in context (e.g., migration) and possibly more dependent on changes in individual specific circumstances.

[4] Available online at http://www.europeansocialsurvey.org. Other sources of GDP per capita are available form IMF and World Bank.

*Dependent variables*: we use self-reported health (subjective, measured on 5 levels (very good, good, fair, bad, very bad)). The question is asked as follows: "*How is your health in general?" Would you say it is,..* (See Table A1 in the Appendix).

*Independent variables*: we use mean values of all dependent variables for the following: individual's country of birth; father's country of birth; mother's country of birth and parents' country of birth (where applicable, using values for where parents were born in the same country). The baseline specification includes population weights and wave controls but no other controls. Then we have include controls that we classify as those proxying for welfare (whether hampered in daily activities by illness, disability, infirmary or mental problem); level of happiness; opinion on state of health services in country nowadays; whether feel discriminated; socioeconomic and demographic status (gender, age, and household size) as well as religious denomination which has been shown to explain some health effects of migration in Europe (Ljunge, 2016). Our data contains records on how long individuals have lived in-country and whether they belong to a minority ethnic group in-country; alongside educational attainment, we include main occupational activity and household net income quintile. Finally, to control for institutions, we include the opinion on state of health services in their country of origin and their feeling about household's income nowadays as well as citizenship information. Further details of all variables are available in Appendix 1.

From our master dataset, we have created two samples: one for the first generation (defined as people born in one country and moved to another) and another for second generation (defined as children of first generation immigrants – where parents are not born in the same country as the child).

*3.2 Empirical Strategy*

The broad range of immigrants from various countries in the ESS reduces the concern that estimates are driven by the effect of small number of ancestral backgrounds. We consider a first generation immigrant the individuals that reside in a different country than that of birth. A second generation migrant refers tpo the children of a first generation migrants, based on their maternal or paternal lineage, or both. We present the summary statistics in Table A1. As in other studies using the same data (Ljunge, 2016) we find that immigrants are similar to the general population on observable variables, with some differences in religion and education, which we control for along with a number of other controls.

Specifically, we examine the association between measures of health of immigrants and that of their country of origin. We rely on the following specification that measure cultural acculturation of first generation migrants:

$$H_{ijt} = \rho \bar{H}_{jt} + \varphi X_{ijt} + \gamma_{jt} + \varepsilon_{ij} \qquad (1)$$

where $H_{ijt}$ of an individual i residing in country j's health assessment, $\bar{H}_{jt}$ refers to the ancestral country j's health assessment, and $X_{it}$ refers to individual specific controls that could upwardly bias the the effect of cultural persistence, specifically $X_{ik} = \{W_{it}|S_{it}\}$ where $W_{it}$ indicates proxy measures for welfare and institutional controls, $S_{it}$ is a vector of an immigrant i's socioeconomic and demographic status. We include a parameter $\gamma_{jt}$ which refers to a country-by-year fixed effect to account for the institutional setting and any other unobserved characteristics whether time invariant or country specific. Finally, $\varepsilon_{ij}$ can stand depending on the specification as picking indicates random shocks, which may include country of origin fixed effects. All standard errors are clustered by the individual's country of origin to account for the arbitrary correlations of error terms among individuals from same

country of origin. We have estimated linear probability models but the results are replicated using both ordered probit and logit models. We have standardised the regression parameters to allow for comparing effects' sizes and interpreting coefficients as 'the effect of one standard deviation on health assessments'. Given that the variation on immigrant composition in the 30 different countries examined is unlikely to be manipulated in manner related to individual characteristics, we believe our estimates have a causal interpretation.

These regressions are regarded as reduced form equations where $\rho$ measures cultural persistence, accounting for a number of other factors influencing assimilation, such as the time in the country. If $\rho$ was close to zero, this would indicate full assimilation. However, one of the limitations of such a strategy is that migrants have been raised under the institutions of the country of origin, and hence inevitably, $\rho$ will pick up institutional effects and not the cultural effect alone. A common way to control for local institutions, in addition to controls, includes focusing on second generation migrants. In so doing, cultural transmission results from the parental transmission of preferences (from parents to children). We run two different specifications, one for the paternal lineage and one for maternal lineage. In addition to this we also run one regression where both parents are from the same country (and use father's country to cluster).

In robustness checks, we restricted our analysis of culture to migrants from a country other than where the survey was undertaken. This way we can precisely estimate the effect for the country of origin of migrants. Further, given that mobility restrictions within Europe are less stringent than between Europe and other parts of the world, and rights and regulations differ, we take a sample of migrants who are just from Europe to overcome potential sources of unobserved heterogeneity that could not be entirely controlled for with destination country fixed effects.

## 4. Results

### 4.1 Descriptive Evidence

Figure 1 reports the association between the first generation's assessed health capital and the average health capital in their country of origin. We show average health assessments and a circle represents the standard deviation of each measure. We show the fitted values of an association between the two measures. For the first generation there is a higher concertation of values around the same area, but this is not the case among second generations. Importantly, the fitted values indicate a steep and positive association between migrants' health assessments and that of their ancestral countries. Further, we find that such associations are stronger for second generation migrants.

**[Insert Figure 1 about here]**

### *4.2 Assimilation*

In Table 1 we begin by examining the association of individual health assessments and that of their countries of ancestry for first generation migrants only. We have examined first a sample without controls, and then a smaller sample that includes a number of controls. Then we have included interactions effects with time in the country since arrival consistently with the literature by using two three dummy variables, whether individuals have spent less than 10 years in the country, between 10 and 20 years ($T10_t$ ) and more than 20 ($T20_t$ ). For all samples examined we find evidence of very strong cultural persistence of migrants and that migrants bring with them some bias from their original institutional environment[5]. Once we control for welfare controls, the coefficient halves to 0.43, and when socio-economic and demographic controls are included (our preferred specification) the coefficient drops to 0.36.

[5] For example, individuals' attitudes towards health systems in terms of trust or cultural differences

Importantly, the results are the same with and without clustering per country of origin. However, the most important finding of Table 1 is that unlike a standard cultural assimilation model, we find that time since arrival in the country increases the association with the culture of the country of ancestry. Up to ten years in the country increases cultural attachment to the country of ancestry by 0.2 scale units and the effect for those staying beyond ten years is on average 0.1 scale units. However, as suggested by some literature, minority groups are more likely to assimilate – as indicated by the corresponding coefficient.

**[Insert Table 1 about here]**

*4.2 Cultural Effects: Second Generation*

Table 2 reports the same estimates as for Table 1 but for second generation migrants (ie children of migrants). Again, as with Table 1, we provide the estimates with and without controls, and then the interaction with time of residence in the country, given that some arrived with their parents. Importantly, we find that cultural persistence is higher for second generation migrants when measured along paternal lineage. That is, the association is higher for paternal country of ancestry (0.44 scale units) than for maternal country of ancestry (0.33 scale unit). The latter results do not change when time in the country and minority controls are added. Consistently with Table, 1, we find that spending up to 20 years or more in the country increases cultural association with ancestral country's health, irrespective of lineage.

**[Insert Table 2 about here]**

*4.4 Gender Specific Effects*

Next in Table 3, results for both first and second generations, split by males and females, are presented. The literature has shown that assimilation effects can differ across men and women. Much like earlier results, we see that associations are still very strong and moreover,

the size of coefficients does not differ significantly when comparing like for like. Our results show very strong evidence of cultural persistence in the evaluation of health status. A change in one standard deviation in migrants' self-assessed health increases one's own self assessed health by 0.36 (16%) irrespective of gender. The effect increases to 0.45 (or an average of 25%) on maternal lineage) and 0.57 (or an average of 25%) on paternal lineage among men. However, among women the effect is 0.24 (or 11% on average among maternal lineage) and 0.32 (or 14% among paternal lineage) for second generation migrants.

**[Insert Table 3 about here]**

## 5. Robustness checks

We run similar regressions on sub samples of the dataset to check robustness of results. Specifically, we check for potential selection effects using subsamples of migrants to EU countries, those born in EU countries, and current residence location. The results are shown in Table 4. The rationale for doing this is to test whether individuals in different parts of Europe hold different cultural norms and beliefs. Again, across all regressions, the notion that current health is influenced by culture is strong. When we focus on individuals born in the EU (and hence those who are more likely to be comparable in terms of rights and institutions), we find that cultural persistence increases for second generations from 0.27 scale points to 0.44 and 0.34 for paternal and maternal lineage respectively. In contrast we find no strengthening (though not fading) cultural persistence when we restrict our sample to those residing in the EU.

We ran other robustness checks (unreported), including splitting the sample into those who were not born in Southern Europe[6] and those who were not born in East or Central Europe. We use these samples because one could argue that long lasting genetic triggers may be location specific in Europe, and choose to present results for those 'not born' rather than 'born' in these areas due to limited sample size. Once again, all results are significant, with first generation coefficients being 0.432 for non-southerners and 0.516 for non-easterners. For the second generation, parents' country has a large and significant effect irrespective of lineage.

## 6. Conclusion

Drawn upon data containing samples of first and second-generation immigrants residing in 30 different European member states and form more than 90 countries of ancestry, we measure the cultural persistence of health capital assessments. This complements previous work, which has mainly compared health trajectories to destination country counterfactuals. Without looking at the outcomes, and specifically the health evaluations of the sending country, we get an incomplete and potentially distorted view of immigrant adaptation and intergenerational "assimilation", which we denote as 'cultural persistence'.

Our findings suggest robust evidence of cultural persistence, an effect which increases for second generation migrants. In addition, we find that time in country of residence strengthens cultural association with the country of ancestry consistently with previous literature eon cultural assimilation. The data has allowed us to control for compositional effects, selection

[6] Country divisions were taken from the UN classification system. Non South means everyone not born in Albania, Bosnia and Herzegovnia, Serbia and Montenegro, Spain, Gibraltar, Greece, Italy, Macedonia, Montserrat, Malta, Portugal, and San Marino. Non Central and Eastern Europe implies everyone not born in Belarus, Cyprus, Czech Republic, Georgia, Croatia, Hungary, Kosovo, Moldova, Poland, Romania, Russia, Slovakia, and Ukraine.

and a number of other potential drivers that pick up the effect of institutions. Our strategy follows that of Luttmer and Singhal (2011), and resulting estimates extend those of Ljunge (2014).

Specifically, we show that there might be important intergenerational persistence in health which does not decrease after one generation. Of course, we do not observe a third generation to be able to tests for a longer run effect. We think our results can be explained by strengthened intergenerational learning mechanisms beyond that of parents. Indeed, migrant parents health assessments, who have chosen to settle in a country, might assimilate to natives more than their children who have not made the choice themselves. Another explanation lies in the potential effects of grandparents and other ancestors.

These results can lead to different policy implications including the policy role of social norms in influencing health production, and more generally in building health capital in light of culture, which has been traditionally ignored in health production models.

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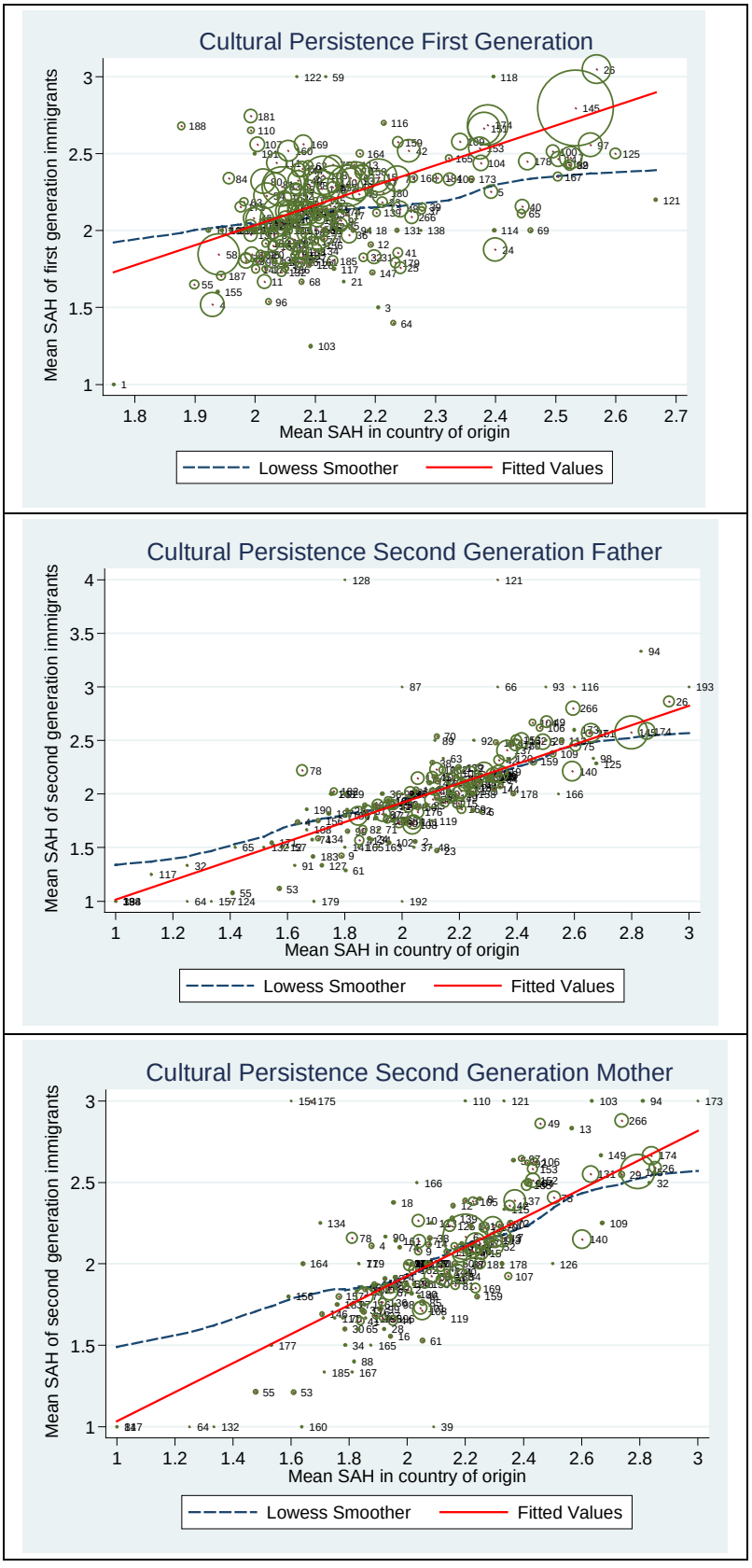
**Figure 1. Cultural Persistence of Health Capital – Correlation of SAH between Country of Origin and Resident of- First and Second (Paternal and Maternal Lineage) Genenration Migrants**



Note: This figure plots corrlelations between country of residence migrants' health and that of their country of origin for first genenration migrants, and that of the country of origin of the mother and father among second genenration migrants.The plot contains in cricles the standard error of the estimates.

**Table 1 Cultural Persistence of Health Status ($\rho$)**

| | (1) | (2) | (3) |
|---|---|---|---|
| VARIABLES | | | |
| $\rho$ | 0.575*** | 0.365*** | 0.336*** |
| | (0.0306) | (0.0372) | (0.0394) |
| $\rho$ x$T20_t$ | | | 0.110 |
| | | | (0.0674) |
| $\rho$ x$T10_t$ | | | 0.199*** |
| | | | (0.0663) |
| $\rho_t$x$M_t$ | | | -0.03*** |
| | | | (0.0118) |
| Welfare | Yes | Yes | Yes |
| Socio-economic | No | Yes | Yes |
| Demographic | No | Yes | Yes |
| Cluster by country of origin | Yes | Yes | Yes |
| Constant | 2.590*** | 2.704*** | 2.772*** |
| | (0.0924) | (0.242) | (0.241) |
| Observations | 23,065 | 17,340 | 17,340 |
| R-squared | 0.411 | 0.481 | 0.482 |

Notes: All estimates include pweights and wave controls (essround). $T_t$ refers to time in the country and $M_t$ refers to belonging to the largest minority group. (1) Contains no controls. (2) Contains controls proxying for welfare (hlthhmp (whether hampered in daily activities by illness, disability, infirmary or mental problem; satisfaction with health services in country nowadays (stfhlth)); whether feel discriminated (dscrntn); socioeconomic and demographic status (rlgdnm (religious denomination); how long have lived in country (livecntr); whether belong to minority ethnic group in country (blgetmg); number of people in household (hhmmb); gender (gndr); marital status(marital); age group (age_gr); number of years of education (eduyrs_gr); main occupational activity (mnactic); household net income quintile (quintile); opinion on state of health services in their country of origin (trust_hs); feeling about household's income nowadays (hincfel); whether citizen of country (ctzcntr); country variable; country income quintile (country quintile). Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

**Table 2. Cultural persistence of Health Status: Paternal and Maternal Lineage (OLS estimates)**

| **Paternal Lineage** | (1) | (2) | (3) |
|---|---|---|---|
| $\rho$ | 0.437*** | 0.440*** | 0.440*** |
| | (0.0545) | (0.0540) | (0.0515) |
| $\rho$ x$T20_t$ | | 0.304*** | 0.304*** |
| | | (0.0683) | (0.0604) |
| $\rho$ x$T10_t$ | | 0.251 | 0.251 |
| | | (0.221) | (0.202) |
| $\rho$ x$M_t$ | | -0.0284 | -0.0284 |
| | | (0.0318) | (0.0318) |
| Constant | 2.584*** | 2.473*** | 2.473*** |
| | (0.340) | (0.341) | (0.475) |
| Observations | 8,156 | 8,156 | 8,156 |
| R-squared | 0.488 | 0.491 | 0.491 |
| **Maternal Lineage** | (6) | (7) | (8) |
| $\rho$ | 0.330*** | 0.330*** | 0.330*** |
| | (0.0556) | (0.0554) | (0.0582) |
| $\rho$ x$T20_t$ | (0.0598) | (0.0660) | 0.288*** |
| | | 0.288*** | (0.0564) |
| $\rho$ x$T10_t$ | | (0.0687) | 0.246 |
| | | 0.246 | (0.217) |
| $\rho$ x$M_t$ | | | -0.0226 |
| | | | (0.0323) |
| Constant | 2.919*** | 2.817*** | 2.817*** |
| | (0.336) | (0.338) | (0.357) |
| Welfare | Yes | Yes | Yes |
| Socio-economic | No | Yes | Yes |
| Demographic | No | Yes | Yes |
| Cluster by country of origin | No | No | No |
| Observations | 8,354 | 8,354 | 8,354 |
| R-squared | 0.483 | 0.486 | 0.486 |

Notes: All estimates include pweights and wave controls (essround). $T_t$ refers to time in the country and $M_t$ refers to belonging to the largest minority group. Controls includes variables proxying for welfare (hlthhmp (whether hampered in daily activities by illness, disability, infirmary or mental problem; satisfaction with health services in country nowadays (stfhlth)); whether feel discriminated (dscrntn); socioeconomic and demographic status (rlgdnm (religious denomination); how long have lived in country (livecntr); whether belong to minority ethnic group in country (blgetmg); number of people in household (hhmmb); gender (gndr); marital status(marital); age group (age_gr); number of years of education (eduyrs_gr); main occupational activity (mnactic); household net income quintile (quintile); opinion on state of health services in their country of origin (trust_hs); feeling about household's income nowadays (hincfel); whether citizen of country (ctzcntr); country variable; country income quintile (country quintile). Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

**Table 3. Cultural Persistence of Health Evaluations by gender**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | **First Generation** | | **Second Generation Paternal Lineage** | | **Second Generation Maternal Lineage** | |
| | Male | Female | Male | Female | Male | Female |
| $\rho$ | 0.368*** | 0.358*** | 0.445*** | 0.242*** | 0.577*** | 0.319*** |
| | (0.0401) | (0.0446) | (0.0783) | (0.0770) | (0.0730) | (0.0770) |
| Welfare | Yes | Yes | Yes | Yes | Yes | Yes |
| Socio-economic | Yes | Yes | Yes | Yes | Yes | Yes |
| Demographic | Yes | Yes | Yes | Yes | Yes | Yes |
| Cluster by country of origin | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 2.457*** | 3.016*** | 2.335*** | 3.521*** | 1.869*** | 3.287*** |
| | (0.342) | (0.278) | (0.425) | (0.462) | (0.410) | (0.468) |
| Observations | 7,758 | 9,582 | 3,802 | 4,552 | 3,711 | 4,445 |
| R-squared | 0.463 | 0.493 | 0.465 | 0.508 | 0.475 | 0.509 |

Notes: All estimates include pweights and wave controls (essround). Contains controls proxying for welfare (hlthhmp (whether hampered in daily activities by illness, disability, infirmary or mental problem; satisfaction with health services in country nowadays (stfhlth)); whether feel discriminated (dscrntn); socioeconomic and demographic status (rlgdnm (religious denomination); how long have lived in country (livecntr); whether belong to minority ethnic group in country (blgetmg); number of people in household (hhmmb); gender (gndr); marital status(marital); age group (age_gr); number of years of education (eduyrs_gr); main occupational activity (mnactic); household net income quintile (quintile); opinion on state of health services in their country of origin (trust_hs); feeling about household's income nowadays (hincfel); whether citizen of country (ctzcntr); country variable; country income quintile (country quintile). Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

**Table 4. Cultural Persistence of Health Evaluations by EU birth and EU residence**

| | Born in the European Union | | | Residence in the European union | | |
|---|---|---|---|---|---|---|
| | First Gen | Second Gen Maternal | Second Gen Paternal | First Gen | Second Gen Maternal | Second Gen Paternal |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $\rho$ | 0.270*** | | | 0.400*** | | |
| | (0.0508) | | | (0.0320) | | |
| $\rho$ _mother lineage | | 0.444*** | | | 0.395*** | |
| | | (0.0726) | | | (0.0628) | |
| $\rho$ _father lineage | | | 0.346*** | | | 0.410*** |
| | | | (0.0674) | | | (0.0585) |
| Welfare | Yes | Yes | Yes | Yes | Yes | Yes |
| Socio-economic | Yes | Yes | Yes | Yes | Yes | Yes |
| Demographic | Yes | Yes | Yes | Yes | Yes | Yes |
| Cluster by country of origin | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 3.240*** | 2.755*** | 2.870*** | 2.623*** | 2.794*** | 2.651*** |
| | (0.339) | (0.454) | (0.465) | (0.223) | (0.396) | (0.399) |
| Observations | 8,074 | 5,094 | 4,956 | 14,154 | 6,244 | 6,109 |
| R-squared | 0.475 | 0.430 | 0.428 | 0.409 | 0.411 | 0.415 |

Notes: All estimates include pweights and wave controls (essround). Contains controls proxying for welfare (hlthhmp (whether hampered in daily activities by illness, disability, infirmary or mental problem; satisfaction with health services in country nowadays (stfhlth)); whether feel discriminated (dscrntn); socioeconomic and demographic status (rlgdnm (religious denomination); how long have lived in country (livecntr); whether belong to minority ethnic group in country (blgetmg); number of people in household (hhmmb); gender (gndr); marital status(marital); age group (age_gr); number of years of education (eduyrs_gr); main occupational activity (mnactic); household net income quintile (quintile); opinion on state of health services in their country of origin (trust_hs); feeling about household's income nowadays (hincfel); whether citizen of country (ctzcntr); country variable; country income quintile (country quintile). Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

# Appendix

## Table A1 Summary Table

| Variable name | Definition | Unit and meaning | Mean | Standard deviation |
|---|---|---|---|---|
| *Dependent variables* | | | | |
| Health | Subjective general health | 1 (very good) -5 (very bad) | 2.251 | (0.937) |
| Health_migrant | Subjective general health in country of birth | | 2.251 | (0.284) |
| Health_ fathers lineage | Subjective general health in father's country of birth | | 2.252 | (0.288) |
| Health_ mothers lineage | Subjective general health in mother's country of birth | | 2.253 | (0.270) |
| *Welfare controls* | | | | |
| hlthhmp | whether hampered in daily activities by illness, disability, infirmary or mental problem | 1 Yes a lot<br>2 Yes to some extent<br>3 No | 2.686 | (0.582) |
| stfhlth | opinion on state of health services in country nowadays | 0 (extremely bad) – 10 (extremely good) | 5.174 | (2.602) |
| dscrntn | Whether feel discriminated on grounds of own nationality | 0 (no); 1 (yes) | 0.013 | (0.114) |
| *Sociodemographic controls* | | | | |
| rlgdnm | religious denomination | 1 Roman Catholic<br>2 Protestant<br>3 Eastern Orthodox<br>4 Other Christian<br>5 Jewish<br>6 Islam<br>7 Eastern religion<br>8 Other non Christian | NA | NA |
| timeincntry | length of time in country | 1 <1 year<br>2 1-5 years<br>3 5-10 years<br>4 10-20 | 4.799 | (0.616) |

| | | | | |
|---|---|---|---|---|
| | | years<br>5 20 years+ | | |
| blgetmg | whether belong to minority ethnic group in country | 0 no<br>1 yes | 0.058 | (0.235) |
| hhmmb | number of people in household | 0 1-4<br>1 5-8<br>2 9-12<br>3 13-24 | 0.123 | (0.340) |
| gndr | gender | 1 Male<br>2 Female | 1.538 | (0.498) |
| Marital | Marital status | 1 married<br>2 separated<br>3 divorced<br>4 widowed<br>5 never married | NA | NA |
| age_gr | Age group | 1 10-20<br>2 20-30<br>3 30-40<br>4 40-50<br>5 50-60<br>6 60+ | 3.692 | (1.706) |
| eduyrs_gr | Education group | 0 none<br>1 1-5 years<br>2 5-10 years<br>3 10-15 years<br>4 15+ | 1.807 | (0.557) |
| mnactic | main occupational activity | 1 paid work<br>2 education<br>3 unemployed, looking<br>4 unemployed, not looking<br>5 permanently sick or disabled<br>6 retired<br>7 community or military service<br>8 housework<br>9 other | NA | NA |
| quintile | household net income category, quintiles | 1 (lowest group)-5 (highest group) | 2.817 | (1.496) |

| | | | | |
|---|---|---|---|---|
| hincfel | feeling about household's income nowadays | 1 living comfortably on present income<br>2 coping on present income<br>3 difficult on present income<br>4 very difficult on present income | 2.105 | (0.898) |
| ctzcnt | Whether individual is citizen of the country | 0 no; 1 yes | 0.959 | (0.196) |
| *Other controls* | | | | |
| Trusths_gr | trust in health system back in their original country | Mean stfhlth by country of birth, grouped into 3 (0 bad, 1 ok, 2 good) | 1.012 | (0.659) |

*bold indicates omitted category