# Micro- and Macro Determinants of Self-Assessed-Health-Status of Immigrants in Europe

Amelie Constant

George Washington University, Washington

Temple University

IZA, Bonn

Teresa García-Muñoz

Department of Quantitative Methods

University of Granada, Spain

Shoshana Neuman*

Department of Economics

Bar-Ilan University, Israel

CEPR, London

IZA, Bonn

Tzahi Neuman

Fox Chase Cancer Center

Philadelphia, PA, USA

On leave from:

Hadassah-Hebrew University Medical Center

Jerusalem, Israel

* Corresponding author. Email: shoshana.neuman@biu.ac.il

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## Abstract

The combination of three factors motivated this study: (i) extensive evidence that subjective-health is a most reliable estimate of the individual's health-status; (ii) the constant growing share of immigrants in Europe (72 million in 2013) that calls for a better understanding of immigrants' behavior/attitudes/health in order to better cater to their needs and integration. To-date, there is limited research on immigrants' health-status; and (iii) the availability of the incredibly rich Survey of Health Aging and Retirement Europe (SHARE) that covers most European countries and facilitates the exploration of the full spectrum of self-assessed-health-status (SAHS), for native-born and immigrants. It is a multidisciplinary and cross-national panel data set of micro data on health, socio-economic status and social and family networks of more than 50,000 individuals aged 50 or over. The SHARE data are supplemented by country-specific macro data for both the 22 countries of origin and the 16 host countries. Improved econometric methods and software (e.g., a unique combination of POLS and Multilevel Analysis, suggested by the authors) lead to a careful analysis and reliable results.

The main findings are: (a) during the first decade after arrival in the host countries, immigrants report higher levels of subjective health compared to their native-born counterparts. As time since migration passes by, reported subjective-health decreases and eventually it is below the reported levels of the natives; (b) the level of development of both the country of origin and the host country (measured by the logarithm of per-capita GDP) affect positively the individual's SAHS (everything else being equal). The effect of the current country of residence is much more pronounced; and (c) it appears that positive and negative deviations (of the host country from the country of origin) have different impacts on individual SAHSs: an increase in a positive deviation (the country of origin is more developed compared to the host country – a 'loss' for the immigrating individual) leads to a decrease in the immigrant's SAHS, while an increase in the absolute negative deviation (a 'gain' for the immigrating person) leads to an increase in the immigrant's SAHS. These differential effects can be explained as some variant of the Loss-Aversion Theory. Following our findings, policy implications and venues for future research are suggested.



Keywords: self-assessed-health-status, immigration, Europe, country of origin, multilevel regression

JEL classifications: C22, J11, J12, J14, O12, O15, O52

## Introduction and motivation

The combination of three factors motivated this study: (i) extensive evidence that subjective-health is a most reliable estimate of the individual's health-status; (ii) the constant growing share of immigrants in Europe that calls for a better understanding of immigrants' behavior/attitudes/health in order to better cater to their needs and integration. To-date, there is limited research on immigrants' health-status; and (iii) the availability of incredibly rich Survey of Health Aging and Retirement Europe (SHARE) that covers most European countries and facilitates the exploration of the full spectrum of self-assessed-health-status (SAHS), by providing individual micro data for 16 countries (Daniel McFadden concluded that "SHARE has become a world-class example of research infrastructure"). The SHARE data base will be supplemented by country-specific macro data (for the sending- and the receiving-country). Improved econometric methods and software (e.g., POLS and Multilevel Analysis) lead to a more careful analysis and reliable results.

(i) The 'internal', view expressed by the 'self-assessed-health-status', has increasingly become a common measure of health in empirical research (e.g., Deaton and Paxson, 1998; Kennedy et al., 1998; Smith, 1999). A person's own understanding of her/ his health is the 'internal' view of health, as opposed to 'external' views that are based on observations of doctors or pathologists (Sen, 2002). The external view of health has come under considerable criticism, particularly from anthropological perspectives, for taking a distanced and less sensitive view of illness and health (Kleinman, 1988, 1995). Moreover, the belief that the individual is the best evaluator of her/his health status was supported by the findings of numerous studies, which indicated that self-ratings of health are good predictors of mortality and morbidity even more than medical records (Mossey and Shapiro, 1982; Idler and Benyamini, 1997; Benyamini and Idler, 1999; Ferraro and Kelley-Moore, 2001; Wang at al., 2001; van Doorslaer and Gerdtham, 2003; Nagarajan and Pushpanjali, 2008; Parissis et al., 2009; and Cesari et al., 2009). Over 200 studies have reported robust relationships between self-assessments-of-heath with mortality and morbidity (Mora et al., 2008). The respondents in the above cited sample surveys are

heterogeneous in terms of: country of residence, socio-economic status, race, ethnicity, education, preventive practices, and health conditions – indicating the universality of the phenomenon. Accordingly, questions on subjective health were recently introduced in questionnaires used within the social sciences and the medical professions. The core variable – self-assessed-health-status (SAHS) - is evaluated by the respondents. Respondents are asked to assess their health-status by rating their overall health on a scale with 4-10 categories, ranging from 'excellent' to 'very poor', or some variant.[1] In the SHARE questionnaire (see below the description of the SHARE survey) the question is: "On a scale from 1 to 5, where 1 describes the worst imaginable condition and 5 the best imaginable condition, how do you rate your health in general?"[2] .

The studies cited above also looked into the determinants of subjective-health, which included medical measures as well as socio-economic factors (e.g., education, wealth, employment, age, marital-status). Country-specific macro-economic measures have also been included in an attempt to better understand population SAHSs, with clear evidence that aggregate country SAHSs are affected by macros like: per-capita GDP, expenditures on health, Human Development Index (HDI), share of obese people, share of active smokers (Garcia-Muñoz, Neuman and Neuman, 2014a, 2014b).[3] It follows that the country macros serve as some reference point when evaluation of individual SAHS takes place – ceteris paribus, higher levels of 'positive' macro measures (for instance: GDP, HDI) lead to more favorable individual SAHSs, while larger 'negative' macros (obesity, smoking) result in lower individual SAHSs.[4]

[1] The subjective view of the respondent's health-status follows many studies on subjective well-being (SWB). For instance: In the World Value Survey the question is "Taking all things together, would you say you are: very happy; quite happy; not happy; not at all happy" (the economics literature tends to relate to 'well-being', 'happiness' and 'life satisfaction' largely interchangeably, whereas the psychology literature distinguishes between these 3 concepts). The holistic view of well-being replaced the old use of income as a sole indicator of the individual's well-being.

[2] In some waves of the SHARE survey (i.e., the 2006 wave) the categories range from 0 to 10 (11categories). In the most recent 2011 wave, which is used for this study, the range is 1-5.

[3] In the same line, it was found that well-being of countries is affected by macros like: GDP, inflation, unemployment, inequality (Di Tella et al., 2001, 2003;Wolfers, 2003)

[4] Another possibility is that the macros are proxy variables for country-level conditions that affect the individual SAHS. For instance: higher levels of per-capita GDP or of HDI could indicate better nutrition, higher quality of health-services etc.

(ii) Migrants offer an interesting case-study because they are confronted with (at least) two reference-points, namely their countries of origin and the host countries. The effects of country-specific macroeconomic factors of both the countries of origin and the receiving countries were already explored in two other contexts (a) the well-being of immigrants, and also (b) the intensity of their religious performance: (a) Akay, Bargain and Zimmermann (2013) examined whether the subjective well-being of migrants in Germany is responsive to fluctuations in macroeconomic conditions in their countries of origin and in the regions where they live in Germany. Using the data of the German Socio Economic Panel for 1984-2009, they found that while immigrants in Germany are positively affected by the performances of the region in which they live (the local macros), they are negatively affected by macros of their countries of origin (migrants' well-being responds negatively to increases in GDP and positively to increases in unemployment in the country of origin). These results are robust for migrants in Germany. It will be interesting to validate the results for other countries as well; (b) In a similar vein, Aleksynska and Chiswick (2013) investigated the effects of local and home-land macros on religiosity of immigrants who arrived in Europe. Employing the European Social Survey (ESS) data base for the statistical analysis, they concluded that both origin and destination country characteristics (such as: economic development, religious pluralism and religious attitudes), are important predictors of religiosity of immigrants. In our study we focus on subjective-health (SAHS) of immigrants, with the attempt to use macroeconomic measures of both the local and origin countries as predictors of immigrants' SAHS.

Immigrants are becoming a significant factor in many countries. The global phenomenon of the constantly growing number of immigrants, in particular in Europe (and in the United States, and more recently in Asia), calls for more extensive research on immigrants' economic/social/religious behavior. The United Nations reports that in 2013, 232 million people, constituting 3.2 percent of the world population, were migrants who lived and worked in a country in which they were not born. Even more impressive is the growth rate of the number of migrants: within about two decades (between 1990 and 2013) the total number of migrants increased by 49.2 percent (from 155.5 in 1990 to 232 in 2013). The most recent data show that *in 2013 Europe hosted 72 million migrants,* constituting a share of 31 percent of the world migrants' stock. Country-level data indicate that five European

countries are within the list of the ten largest immigrant absorbing countries: Russia with 11 million immigrants, Germany – 9.8 million, France - 7.4 million, Britain – 7.8 million and Spain – 6.5 million (United Nations, 2013).[5] Europe has changed its immigration status from a 'sending' to a 'receiving' society.[6]

More detailed country-specific information can be gained from Table 1, which presents the sizes (in 1,000s) and the shares of foreign-born populations in Europe for the year 2010.

**Table 1: Foreign-born populations in European countries, 2010**

| Country | Number of foreign born (1,000s) | Share of foreign born (% in total population) | Share of born in non-European countries (% in total population) |
|---|---|---|---|
| Austria | 1,276.0 | 15.2 | 9.1 |
| Belgium | 1,503.8 | 13.9 | 7.0 |
| Cyprus | 150.7 | 18.8 | 13.5 |
| The Czech Rep. | 398.5 | 3.8 | 2.6 |
| Denmark | 500.8 | 9.0 | 6.3 |
| Estonia | 217.9 | 16.3 | 15.0 |
| Finland | 228.5 | 4.3 | 2.8 |
| France | 7,196.5 | 11.1 | 7.8 |
| Germany | 9,812.3 | 12.0 | 7.8 |
| Greece | 125.6 | 11.1 | 8.3 |

[5] The other five are: The United States – 45.8 million, Saudi-Arabia – 9.1 million, the Union of Gulf Countries – 7.8 million, Canada – 7.3 million and Australia – 5.6 million (United Nations, 2013).

[6] Immigration flows into Western Europe came for several sources: immigrants from the former colonies of European countries (in North and West Africa, and South and Southeast Asia) arrived in France, England and the Netherlands; migrant labor from the less developed Southern European countries (Italy, Spain, Portugal, Greece, Yugoslavia, and Turkey) were attracted by "guest-workers" programs; refugees, asylum seekers and illegal migrants fled (and are still fleeing) from less privileged regions that suffer from famines, wars and political violence; and immigrants from the Former Soviet Union and Eastern Europe left their native countries when the gates opened after the collapse of communism in 1989. The heterogeneity of the countries of origin led to large variations in the educational attainments and wages of immigrants in Europe: immigrants from non-OECD countries have lower educational levels and wages, particularly when compared to natives and immigrants from the EU15 countries (Dustmann and Frattini, 2011).

| Country | Number of foreign born (1,000s) | Share of foreign born (% in total population) | Share of born in non-European countries (% in total population) |
|---|---|---|---|
| Hungary | 436.6 | 4.4 | 1.4 |
| Iceland | 35.1 | 11.0 | 3.7 |
| Ireland | 565.6 | 12.7 | 2.9 |
| Italy | 4,798.7 | 8.0 | 5.3 |
| Latvia | 343.3 | 15.3 | 13.6 |
| Luxembourg | 163.1 | 32.5 | 5.6 |
| The Netherlands | 1,832.5 | 11.1 | 8.5 |
| Norway | 524.6 | 10.8 | 6.5 |
| Poland | 456.4 | 1.2 | 0.7 |
| Portugal | 793.1 | 7.5 | 5.7 |
| Slovakia | 50.4 | 0.9 | 0.4 |
| Slovenia | 253.8 | 12.4 | 11.0 |
| Spain | 6,442.8 | 14.0 | 8.9 |
| Sweden | 1,337.2 | 14.3 | 9.2 |
| UK | 7,012.4 | 11.3 | 7.7 |

Source: Eurostat (online data access: tps00178, migr_pop3ctb)
Notes: Data are not available for Bulgaria, Croatia, Switzerland and Ukraine. The Slovakian data are for the year 2009. The Belgian data are provisional.

As Table 1 indicates, immigrants comprise more than 10 percent of the local population in a large number of European countries. At the top ranks we find Luxembourg (32.5 percent of the population are immigrants), Cyprus (18.8 percent) and Estonia (16.3 percent). The share of immigrants is below 5 percent in only a few countries (Slovakia ranks last with immigrants comprising only 0.9 percent of the total population). The majority of immigrants were born in non-European countries. Moreover, given that most European countries were facing during the last decades a dramatic drop in fertility within the native

populations[7], combined with figures of significantly higher fertility rates among immigrants in Europe[8], leads to the forecast of growing shares of immigrants. The religious landscape in Europe is also expected to change, due to the large share of Moslem immigrants. According to the Pew Research Center (2011), the Moslem share in the European population (as a whole) is expected to grow by nearly one-third over the next 20 years, rising from 6% of the region's population, in 2010, to 8% in 2030.[9]

Against the background of the growing share of immigrants within the European populations, a better understanding of the various aspects of immigrants' behavior (including health) is therefore essential in order to derive policies that will ensure their well-being and successful integration. There is already a large body of research that examined aspects of immigrants' health. The literature suggests that immigrants are often healthier than natives in the host countries and also compared to non-migrators remaining in their countries of origin (e.g., Antecol and Bedard, 2006; Kennedy, McDonald and Biddle, 2006). There is also a consistent finding that immigrants who tend to be healthier upon arrival in the receiving countries, eventually assimilate to the less healthy patterns in their host countries ("the healthy immigrant effect", see for instance, Antecol and Bedard, 2006; Kennedy, McDonald and Biddle, 2006; Averett, Argys and Kohn, 2012). Many of these studies focus on weight-related health outcomes, noting that immigrants (shortly after

[7] Eurostat data show that, the number of live births in Europe in 1970 was 7.15 million babies, while in 2010 this figure decreased to 5.36 million. The most pronounced changes in the average number of live births per woman are evidenced in the European Catholic countries: Ireland (from 3.8 in the early 1970s, down to 2.1 in 2010), Spain (from 2.2 in the early 1980s to 1.4 in 2010), Portugal (from 3.0 in the early 1970s to 1.4 in 2010), Italy (from 2.4 in 1970 to 1.4 in 2009), and Poland (from 2.1 in 1990 to 1.4 in 2010).

[8] An examination of national country measures shows that: in Spain, in 2009, the number of births per 1000 women in fertility age, was 9.7 within the Spanish native population, compared to 17.8 within the foreign population (National Institute for Statistics-INE, Spain); in the UK, in 2010, the Total Fertility Rate (TFR) of UK-born mothers was 1.88, versus 2.45 for non-UK-born mothers (Office for National Statistics-ONS, UK); in Sweden, in 2010, TFR for Swedish mothers was 1.8, compared to 2.3 for foreign mothers (Statistics Sweden); in Switzerland, in 2010, TRF measures were 1.4 and 1.9 for Swiss and foreign-born mothers, respectively (Swiss Statistical Office); and, in Italy, in 2010, the average number of children was 1.3 for Italian mothers compared to 2.1 for foreign-born mothers (National Institute for Statistics-ISTAT, Italy).

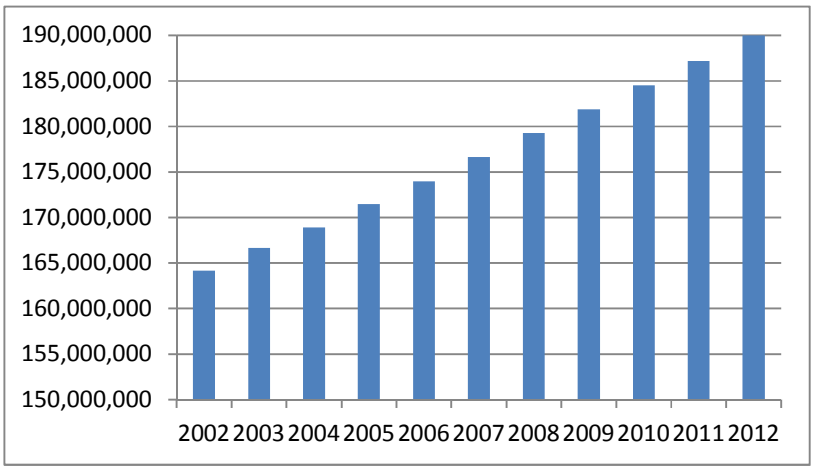
[9] This prediction is further developed in Goujon et al. (2006). They consider relative fertility, migration, and intergenerational religious transmission and offer projections for the future religious composition of Austria (in 2051), claiming that by 2051 Moslems will compose 14%-26% of the Austrian population. Moreover, if current fertility trends will not change, Islam could represent in 2051 the major religion of those below 15 years of age. These projections are based on an assumption of an annual inflow of 20,000 Moslem immigrants. In other European countries that have more significant inflows of immigrants from Moslem countries (e.g. Germany, Spain), the changes in the share of immigrants and in the religious composition of the country could be accelerated and more dramatic.

arrival) are less likely to be obese compared to their native-born counterparts (McDonald and Kennedy, 2005; Kirchengast and Schobert, 2006). In our study we relate to the much broader notion of health, namely, the self-assessed health-status, and focus on the supplementary effects of country-specific macro variables within the immigrant's two reference points – the receiving and the sending countries – beyond and above the micro medical and socio-economic determinants of SAHS.

(iii) The very rich Survey of Health Aging and Retirement Europe (SHARE) data base is an ideal data set for the exploration of the full spectrum of factors behind the SAHS (of natives and of immigrants). It is a multidisciplinary and cross-national panel data set of micro data on health, socio-economic status and social and family networks of more than 50,000 individuals aged 50 or over. They are a balanced representation of the various regions in Europe, ranging from Scandinavian countries (Denmark and Sweden), through Central Europe (Austria, France, Germany, Switzerland, Belgium, the Czech Republic and the Netherlands) and Eastern Europe (Poland, Hungary, the Slovak Republic and Estonia), to the South (Spain, Italy and Portugal).

Health starts to deteriorate around the age of 50. It is therefore natural to examine the determinants of SAHS using samples from the population aged 50 or above. Moreover, the share of this sub-population is constantly growing in virtually all countries (see Figure 1) and catering to its health needs, is of great socio-political importance.

**Figure 1: Size of population aged 50 and over, Europe**




Source: Eurostat (2013)

The empirical analysis includes two strata: (1) estimation of SAHS equations, using a large set of personal medical and socio-economic characteristics as explanatory variables, controlling for random country effects. *Multilevel Regression Analysis* is used for estimation. This method is designed for clustered/nested observations (e.g., a group of individuals/observations in each country in the sample) and allows for the inclusion of country-specific macros (e.g., country-specific levels of the logarithm of per-capita GDP), in addition to country random effects. As we focus on immigrants' SAHS, the equation includes dummy variables for immigrants (individuals who were not born in the current country of residence), with a distinction between different duration periods since migration (10 years or less; 11-to-20 years; 21 years or more). In a second Model, per-capita GDP (logarithm) in the country of residence, is also added as an explanatory variable; (2) estimation of separate SAHS equations for the immigrants' sample (with the same set of micro medical and socio-economic variables). Three Models are estimated: In the first one, per-capita GDP (logarithm) in the country of residence, is also added as an explanatory variable controlling for random country-effects of the host countries; As our main focus here are the macro effects of the host versus the sending countries. The logarithm of per-capita GDP of the host countries and the countries of origin are both included in a second model (controlling of random-effects of the two sets of countries). The respective coefficients indicate whether the GDPs of the two reference points have similar or different effects (in terms of sign and magnitude) on the immigrant's evaluation of her/his health-status; Additionally, the effects of differences between these macros are analyzed in a third model, distinguishing between positive and negative differences, and thus allowing for asymmetry.

The next section presents the empirical analysis and findings and the last section offers concluding remarks and policy implications.

## Empirical analysis

### *The data set*

Share is a collaborative effort of more than 150 researchers world-wide, organized in multidisciplinary national teams and cross-national working groups. A scientific

monitoring board and a network of advisors help to maintain and improve the project's scientific standards. The main funding comes from the European Commission (5th, 6th and 7th framework programs). It will constitute a longitudinal data base. Three waves have been completed already – in 2004, 2007 and 2011.

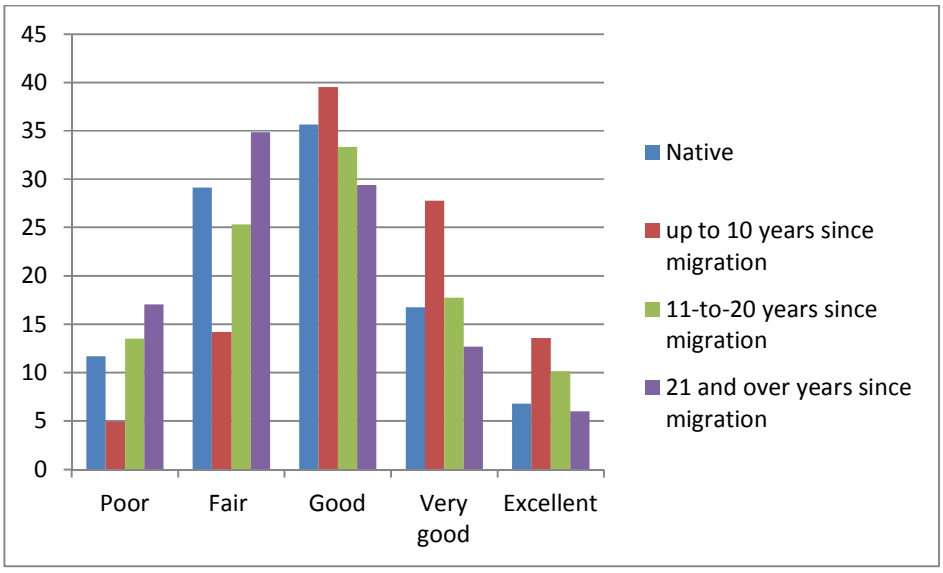
Data collected include health variables (e.g. self-reported health, health conditions, physical and cognitive functioning, health behavior, use of health-care facilities); bio-markers (e.g. grip strength, body-mass index); psychological variables (e.g. psychological health, well-being, life satisfaction); economic variables (e.g. current work activity, job characteristics, opportunities to work past retirement age, sources and composition of current income, wealth and consumption, health insurance, housing, education); and social variables (e.g. marital variables, immigration status, years since migration, country of origin of migrants, assistance within families, transfers of income and assets, social networks, volunteer activities).

The SHARE data base will facilitate our goal of exploring the various determinants of SAHS, as well as the country-specific effects. For immigrants, the effects of the two reference countries will be explored (the country of origin, and the receiving country).

*SAHS of natives and immigrants – descriptive statistics*

Figure 2 presents the distribution of *raw* (not controlled for differences in medical and socio-economic characteristics) SAHS levels for native-born individuals, along with immigrants at the three levels of duration since migration (up to 10; 11-20; 21 and over).

**Figure 2: Distribution of raw SAHS levels**




As is evident from the graph, during the first decade after arrival in the host countries, immigrants report higher levels of subjective health compared to their native-born counterparts: lower relative frequencies for the 'poor' and 'fair' categories and larger frequencies for the 'good', 'very good' and 'excellent' categories. For instance: an 'excellent' health-status is reported by about 6 percent of the native-born, compared to about 14 percent of immigrants who stay 10 years or less in the host country . As time since migration passes by, reported subjective-health decreases and eventually it is below the reported levels of the natives.

*Estimation of SAHS equations - Econometric considerations*

The dependent variable is the respondent's subjective assessment of her/his health-status, ranging from 1 (worst imaginable condition) to 5 (best imaginable condition).

Since reported subjective-health is intrinsically ordinal (with 5 values of 1-5), the natural way to estimate a SAHS equation is by using Ordered Logit or Ordered Probit. Interpretation of the regression coefficients of this type of estimation is difficult and not intuitive. Van Praag and Ferrer-i-Carbonell (2008) suggested a modification of the standard Ordered Logit/Probit models labeled Probit-Adapted OLS (POLS): the ordered dependent variable is "roughly" cardinalized by, first, calculating the relative frequencies of its different outcome categories, and then placing these frequencies into a standard normal

distribution function. Consequently, the newly defined dependent variable takes the conditional mean of a standard normally-distributed continuous variable. OLS is then used for estimation. We further modify the POLS method by using Multilevel Regression Analysis instead of simple OLS.

Multilevel modeling is a generalization of regression methods especially suitable when observations are clustered/nested (e.g., individuals in each country), as in our case. Multilevel regression models are superior to OLS models as they allow controlling for group (country) random-effects. Traditional (OLS) regression models also allow controlling for group effects, by including dummy variables for countries (Fixed-Effects Models). But in this case it is not possible to also include country-level macro variables (collinearity). *We combine POLS and Multilevel estimation models*: POLS is used for the redefinition of the dependent categorical variable, and Multilevel regression facilitates the inclusion of country random-effects along with country-specific macro variables.

1. *SAHS equation – sample of natives and immigrants*

Table 2 presents a SAHS equation for the whole sample of natives and immigrants. Multilevel regression analysis is used for estimation. As noted above, this regression method allows for controlling for country effects and for the inclusion of country-level variables, at same time. A Likelihood Test comparing OLS and multilevel regressions was conducted indicating that multilevel regression improves OLS ($\chi^2(1)=3668.4$; p-value=0.000). The equation includes a battery of medical and socio-economic explanatory variables (see Appendix A.1 for definitions, and Garcia-Munoz, Neuman and Neuman, 2014a, and 2014b, for description of effects) and our core variables that relate to the immigration status: immigrants who arrived in the current country of residence 10 or less years ago, 11-to-20 years ago, and more than 20 years ago. In model 2 we added the logarithm of per-capita GDP (in the country of residence). As is evident from Table 2, the net effect of the immigration status is not uniform and depends on duration in the receiving country: Immigrants who stay in the country a decade or less seem to report significantly

higher levels of SAHS compared to native-born (everything else being equal). During the second decade of stay the immigrant-native difference becomes negative, and after two decades the immigrants are fully integrated in the subjective-health sense, reporting similar levels as native-born individuals. These findings are in line with findings of studies who examined the effect of immigration status on obesity (McDonald and Kennedy, 2005; Kirchengast and Schobert, 2006).

In Model 2 the host country's per-capita GDP (logarithm) is added as an explanatory variable. The positive significant coefficient indicates that individuals residing in more developed countries (higher GDP per-capita) report higher levels of SAHS (everything else being equal). This positive effect could stem from omitted variables (e.g., nutrition, quality of health-services) that are correlated with GDP and are therefore captured by the GDP variable. Another option is that a more positive reference-point (higher country-GDP) per-se leads to an increase in the subjectively-reported SAHS.

**Table 2: Determinants of SAHS, Whole Sample, Multilevel Regression, SHARE 2011**

| Variables | Model 1<br>Coefficients (t-statistics) | Model 2<br>Coefficients (t-statistics) |
|---|---|---|
| (i) Immigrant status | | |
| Up to 10 years since migration | 0.120 (2.236)** | 0.120 (2.228)** |
| 11 –to- 20 years since migration | -0.107 (-2.365)** | -0.108 (-2.385)** |
| 21 or more years since migration | -0.003 (-0.269) | -0.004 (-0.346) |
| (ii) Country of residence variables | | |
| Logarithm of per capita GDP | - | 0.289 (6.773)*** |
| (iii) Socio-economic personal variables | | |
| Male | -0.066 (-10.312)*** | -0.066 (-10.300)*** |
| Age (years) | | |
| 50-60 | Ref. | Ref. |
| 61-70 | -0.006 (-0.804) | -0.006 (-0.824) |
| 71-80 | -0.039 (-4.378)*** | -0.039 (-4.425)*** |
| 81-90 | -0.058 (-4.587)*** | -0.058 (-4.630)*** |
| over 90 | 0.069 (2.030)** | 0.069 (2.014)** |
| Education | | |
| More than 12 years of schooling | 0.115 (16.629)*** | 0.115 (16.616)*** |
| Marital status | | |
| Single/Divorced/Separated | Ref. | Ref. |
| Married | 0.025 (3.012)*** | 0.025 (3.028)*** |
| Widowed | 0.025 (2.163)** | 0.025 (2.185)** |
| Number of children in household | 0.008 (1.698)* | 0.008 (1.739)* |
| (iv) Personal medical variables | | |
| Drug use | -0.072 (-25.973)*** | -0.072 (-25.957)*** |
| Health conditions – diagnosed with: | | |
| Heart problems | -0.097 (-10.287)*** | -0.097 (-10.290)*** |

| Variables | Model 1<br>Coefficients (t-statistics) | Model 2<br>Coefficients (t-statistics) |
|---|---|---|
| Hypertension | -0.029 (-4.274)*** | -0.029 (-4.273)*** |
| Cerebral vascular disease | -0.102 (-6.763)*** | -0.103 (-6.768)*** |
| Diabetes | -0.106 (-10.949)*** | -0.106 (-10.954)*** |
| Chronic lung disease | -0.123 (-10.022)*** | -0.123 (-10.033)*** |
| Arthritis | -0.158 (-20.650)*** | -0.157 (-20.607)*** |
| Osteoporosis | -0.082 (-3.245)*** | -0.083 (-3.255)*** |
| Cancer | -0.269 (-20.467)*** | -0.269 (-20.480)*** |
| Number of medical symptoms | -0.100 (-43.725)*** | -0.100 (-43.742)*** |
| Medical consultation (number) | -0.010 (-29.913)*** | -0.010 (-29.896)*** |
| Hospitalization (dummy) | -0.154 (-17.881)*** | -0.154 (-17.886)*** |
| Quality of eyesight (range of 1-5) | 0.141 (42.096)*** | 0.141 (42.036)*** |
| Alcohol consumption | 0.043 (5.580)*** | 0.043 (5.576)*** |
| Obesity (BMI>30) | -0.076 (-10.283)*** | -0.076 (-10.273)*** |
| ADL | -0.029 (-11.232)*** | -0.029 (-11.241)*** |
| IADL | -0.024 (-9.087)*** | -0.024 (-9.086)*** |
| Cognitive skills: remembered animals | 0.010 (23.281)*** | 0.010 (23.231)*** |
| Sample Size | 51,383 | 51,383 |
| AIC | 103432 | 103413 |
| BIC | 103724 | 103714 |

* significant at 0.10; ** significant at 0.05; ***significant at 0.01

Notes: For definition and description of variables, see Appendix Table A.1; The dependent variable is 'cardinalized' using the POLS procedure (and then using multilevel regression instead of OLS); Country random-effects (16 countries) are included.

*2. SAHS equation – sample of immigrants*

Table 3 presents SAHS equations for the immigrants' sample. We use multilevel regressions, grouping by receiving countries (16 countries). In Model 2, that introduces

macros of both the sending and the receiving countries, origin-country effects (22 countries) are also added, as well as their per-capita GDP (logarithm). In order to get more insight into the differential effects of the level of development of the sending and receiving countries, we define in Model 3, differences between the logarithm of home- and host country per-capita GDPs and create these two variables: Positive difference between origin- and receiving country GDPs (country of origin more developed) and negative difference between origin- and receiving country GDPs (home country less developed). The first one is equal to the difference between the logarithms of GDP in origin and receiving countries, if this difference is positive, and zero otherwise. The second one is equal to the *absolute* value of the difference between origin- and host country GDPs (logarithm) if this difference is negative, otherwise it is equal zero. Different coefficients of these two variables indicate asymmetry in the effects of positive and negative deviations.

**Table 3: Determinants of SAHS, Immigrants' Sample, Multilevel Reg., SHARE 2011**

| Variables | | Model 1 Coefficients (t-statistics) | Model 2 Coefficients (t-statistics) | Model 3 Coefficients (t-statistics) |
|---|---|---|---|---|
| (i) Immigrant status | | | | |
| 11 –to- 20 years since migration | | -0.208*** | -0.201*** | -0.200*** |
| | | (-2.996) | (-2.853) | (-2.844) |
| 21 and over years since migration | | -0.129** | -0.128** | -0.127** |
| | | (-2.297) | (-2.285) | (-2.268) |
| (ii) Country variables | | | | |
| Logarithm of per capita GDP (host country) | | - | 0.244*** | - |
| | | | (3.260) | |
| Logarithm of per capita GDP (country of origin) | | - | 0.021* | 0.268*** |
| | | | (1.732) | (3.608) |
| Positive difference between origin and host GDPs | | - | - | -0.202** |
| | | | | (-2.036) |
| Negative difference between origin and host GDPs | | - | - | 0.250*** |
| | | | | (3.347) |
| (iii) Socio-economic personal variables | | | | |
| Male | | -0.080*** | -0.078*** | -0.078*** |
| | | (-3.690) | (-3.576) | (-3.585) |
| Age (years) | | | | |
| | 50-60 | Ref. | Ref. | Ref. |
| | 61-70 | 0.024 | 0.019 | 0.018 |
| | | (0.928) | (0.726) | (0.694) |
| | 71-80 | 0.038 | 0.031 | 0.032 |
| | | (1.284) | (1.060) | (1.066) |

| Variables | Model 1 Coefficients (t-statistics) | Model 2 Coefficients (t-statistics) | Model 3 Coefficients (t-statistics) |
|---|---|---|---|
| 81-90 | 0.052 | 0.043 | 0.043 |
| | (1.219) | (1.010) | (1.007) |
| over 90 | 0.278* | 0.268* | 0.264* |
| | (1.840) | (1.772) | (1.743) |
| Education | | | |
| More than 12 years of schooling | 0.109*** | 0.109*** | 0.108*** |
| | (4.970) | (4.955) | (4.919) |
| Marital status | | | |
| Single/Divorced/Separated | Ref. | Ref. | Ref. |
| Married | 0.026 | 0.026 | 0.027 |
| | (0.972) | (0.967) | (0.981) |
| Widowed | 0.014 | 0.014 | 0.014 |
| | (0.392) | (0.377) | (0.381) |
| Number of children in household | 0.030* | 0.033** | 0.033** |
| | (2.038) | (2.253) | (2.225) |
| (iv) Personal medical variables | | | |
| Drug use | -0.081*** | -0.081*** | -0.081*** |
| | (-8.996) | (-9.035) | (-9.031) |
| Health conditions – diagnosed with: | | | |
| Heart problems | -0.066** | -0.066** | -0.066** |
| | (-2.228) | (-2.221) | (-2.227) |
| Hypertension | -0.039* | -0.040* | -0.041* |
| | (-1.720) | (-1.757) | (-1.772) |
| Cerebral vascular disease | 0.013 | 0.012 | 0.011 |
| | (0.291) | (0.256) | (0.251) |
| Diabetes | -0.159*** | -0.157*** | -0.157*** |
| | (-5.058) | (-5.002) | (-5.009) |
| Chronic lung disease | -0.147*** | -0.148*** | -0.148*** |
| | (-3.894) | (-3.925) | (-3.928) |
| Arthritis | -0.125*** | -0.123*** | -0.122*** |
| | (-5.110) | (-5.010) | (-4.994) |
| Osteoporosis | -0.208** | -0.216*** | -0.216*** |
| | (-2.372) | (-2.467) | (-2.463) |
| Cancer | -0.164*** | -0.165*** | -0.164*** |
| | (-3.863) | (-3.873) | (-3.866) |
| Number of medical symptoms | -0.083*** | -0.083*** | -0.083*** |
| | (-11.384) | (-11.378) | (-11.376) |
| Medical consultation (number) | -0.010*** | -0.010*** | -0.010*** |
| | (-8.749) | (-8.657) | (-8.665) |
| Hospitalization (dummy) | -0.091*** | -0.092*** | -0.092*** |
| | (-3.224) | (-3.273) | (-3.268) |
| Quality of eyesight (range of 1-50) | 0.154*** | 0.153*** | 0.153*** |
| | (13.163) | (13.021) | (13.016) |
| Alcohol consumption | 0.067** | 0.064** | 0.064** |
| | (2.320) | (2.188) | (2.215) |
| Obesity (BMI>30) | -0.072** | -0.071** | -0.071** |

| Variables | Model 1 Coefficients (t-statistics) | Model 2 Coefficients (t-statistics) | Model 3 Coefficients (t-statistics) |
|---|---|---|---|
| | (-2.916) | (-2.873) | (-2.862) |
| ADL | -0.027*** | -0.028*** | -0.028*** |
| | (-3.399) | (-3.477) | (-3.479) |
| IADL | -0.029*** | -0.028*** | -0.028*** |
| | (-3.478) | (-3.455) | (-3.445) |
| Cognitive skills: remembered animals | 0.015*** | 0.015*** | 0.015*** |
| | (10.274) | (9.969) | (9.975) |
| Sample Size | 4,514 | 4,514 | 4,514 |
| AIC | 9119 | 9111 | 9113 |
| BIC | 9324 | 9329 | 9338 |

* significant at 0.10; ** significant at 0.05; ***significant at 0.01

Notes: For definition and description of variables, see Appendix Table A.1; The dependent variable is 'cardinalized' using the POLS procedure (and then using multilevel regression instead of OLS); Country random-effects (16 countries) are included in all Models; Country-of-origin random-effects (22 countries) are added to Models 2 and 3.

As Table 3 clearly indicates, immigrants who arrived in the current country of residence *more* than 10 years ago report significantly lower levels of SAHS compared to immigrants who arrived 10 or less years ago (the reference group).

The GDP of the two reference countries, the country of origin and the current host country, have positive significant effects on SAHS, but the host country's GDP seems to have a much more pronounced effect. Interestingly, Akay, Bargain and Zimmermann (3013) who studied the effects of the countries of origin on the subjective-well-being of immigrants in Germany, found that the GDP of the country of origin has a negative effect on their current well-being. The different results could stem from the different variables/aspects that are studied, subjective-health versus subjective well-being, and/or different mechanisms of effect: living in a more developed country (before migration) could result in better health later on in life (due to better nutrition, vaccination, preventive health systems etc.). This is not relevant in the case of well-being, where the GDP of the country of origin serves (most probably) only a psychological reference point: leaving a more developed country of origin leads to less satisfaction in the receiving country.

Model 3 adds more insight on the differential effects of the sending and receiving countries, by splitting the differences between the GDPs of the sending and receiving countries into positive and negative differences, allowing for asymmetry around the no-difference point. This is done by using variables of positive deviations (between home- and host countries) and absolute negative deviations, in addition to the home country GDP. As the results indicate, an increase in a positive deviation leads to a decrease in the immigrant's SAHS, while an increase in the absolute negative deviation leads to an increase in the immigrant's SAHS. It therefore appears that positive and negative deviations have different impacts on individual SAHSs (see discussion in next section).

**Concluding remarks and policy implications** (still needs more input…)

a. Our results are in line with findings of other papers in the health literature and indicate that upon arrival in the host country immigrants tend to be healthier (less obese) than their native-born counterparts, but they gradually assimilate and at some stage their health-status becomes even poorer than to that of the natives. The more novel finding relates to the macro effects of the development levels of both the country of origin and the host country – the GDPs of the two reference countries have positive effects on the individual's perceived-health (SAHS). However the effect of the host country's GDP is much more pronounced. The use of a (unique) combination of POLS and Multilevel Regression warrants reliable results.
b. It appears that positive and negative deviations have different impacts on individual SAHSs. These differential effects can be explained as some variant of the Loss-Aversion Theory: A larger positive deviation means that the immigrant suffered from some 'loss' when he left his country of origin and immigrated to a less developed country. A negative deviation represents a 'gain' for the immigrant. The Loss-Aversion Theory (e.g., Kahneman and Tversky, 1979) claims that 'losses' are valued more than same-size 'gains', and this is precisely what our results indicate.
c. The SHARE data set that is used for the empirical examination includes individuals aged 50 and over. Thus, the results presented above apply to this age group and can not be generalized without further investigation that will employ broader age groups. However, the older age group is more relevant when health is evaluated and

examined for its determinants. Around this age health starts to deteriorate and policies/budgets/programs that aim at catering to residents' (including immigrants') health needs become more important and urgent.

d. Our results indicate that the immigration status (and duration) and macros of the sending- and receiving countries have significant effects on the individual's SAHS. However, the mechanisms still need to be explored. The mechanism is most probably determined by the nature of the variable under discussion (e.g., health versus well-being). This could explain why GDP of country of origin affects positively health and negatively well-being (Akay, Bargain and Zimmermann, 2013). In order to gain more (indirect) insight and to be able to better understand the mechanism, other macros can be examined, e.g.: the Human Development Index, country expenditures on health and education, income inequality, unemployment. A comparison of effects of this battery of macros could lead to some speculation about the mechanism.

e.

f.

g.

**References**

Akay, A, Bargain, O, and Zimmermann K.F. (2013), "Home Sweet Home? Macroeconomic Conditions in Home Countries and the Well-Being of Migrants", *IZA Discussion Paper No. 7862*. Bonn.

Aleksynska, M. and Chiswick, B.R. (2011), "Religiosity and Migration: Travel into One's Self versus Travel across Cultures", *IZA Discussion Paper No. 5724.* Bonn.

Antecol, H. and Bedard, K. (2006), "Unhealthy Assimilation: Why Do Immigrants Converge to American Health Status Levels?" *Demography* 43(2):337-360.

Averett, S.L., Argys, L.M. and Kohn, J.L. (2012), "Immigration, Obesity and Labor Market Outcomes in the UK", *IZA Discussion Paper No. 6454.* Bonn.

Benyamini, Y. and Idler E.L. (1999), "Community Studies Reporting Association between Self-Rated Health and Mortality: Additional Studies, 1995-1998", *Research on Aging* 21: 392-401.

Cesari, M., Pahor, M., Marzetti, E., Zamboni, V., Colloca, G., Tosato, M., Patel, K.V., Tovar, J.J. and Markides K. (2009), "Self-Assessed Health Status, Walking Speed and Mortality in Older Mexican-Americans", *Gerontology* 55(2): 194-201.

Deaton, A. and Paxson, C.H. (1998), "Aging and Inequality in Income and Health", *American Economic Review, Papers and Proceedings* 88: 248-253.

Di Tella, R., MacCulloch, R. and Oswald, A. (2001) "Preferences over Inflation and Unemployment. Evidence from Surveys of Happiness", *The American Economic Review* 91(1): 335–341.

Di Tella, R., MacCulloch, R. and Oswald, A. (2003) "The Macroeconomics of Happiness", *Review of Economics and Statistics* 85(4): 809-827.

Dustmann C. and Frattini T. (2011), "Immigration: The European Experience" *IZA Discussion Paper No. 6261*. Bonn.

Eurostat (2013), *Population on January 1st 2013, by Five-Year Age Groups and Sex*. Can be accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home.

Ferraro, K.F. and Kelley-Moore, J.A. (2001), "Self-Rated Health and Mortality among Black and White Adults: Examining the Dynamic Evaluation Thesis", *Journals of Gerontology: Psychological and Social Sciences* 56B: S195-S205.

García-Muñoz, T., Neuman, S. and Neuman T. (2014a), "Subjective Health Status of the Older Populations: Is it Related to Country-Specific Economic Development Measures?" *Working Paper 2014-02,* Department of Economics, Bar-Ilan University.

García-Muñoz, T., Neuman, S. and Neuman T. (2014b), "Health Risk Factors among the Older European Populations: Personal and Aggregate Country Effects", Bar-Ilan University, *mimeo.*

Idler, E.L. and Benyamini, Y. (1997), “Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies”, *Journal of Health and Social Behavior* 38(1): 21-37.

Goujon, A., Skirbekk, V., Fliegenschnee, K. and P. Strzelecki (2006), "New Times, Old Beliefs: Projecting the Future Size of Religions in Austria", *Working Paper 01/2006.* Vienna Institute of Demography.

Kahneman, D. and Tversky, A. (1979), "Prospect Theory: An Analysis of Decision Under Risk", *Econometrica* 47: 263-291.

Kennedy, B.P., Kawachi, I., Glass, R. and Prothrow-Stith, D. (1998), “Income Distribution, Socio-Economic Status, and Self-Rated Health in the United States: Multilevel Analysis”, *British Medical Journal* 317: 917-921.

Kennedy, S., McDonald, J. and Biddle, N. (2006), "The Healthy Immigrant Effect and Immigrant Selection: Evidence from Four Countries", *SEDAP Research Paper No. 164*. Available at http://socserv.mcmaster.ca/sedap/p/sedap164.pd

Kleinman, A. (1988), *The Illness Narrative: Suffering, Healing and the Human Condition.* New-York: Basic Books.

Kleinman, A. (1995), *Writing at the Margin: Discourse between Anthropology and Medicine*. Berkeley: University of California Press.

Kirchengast, S. and Schobert, E. (2006), "Being an Immigrant: A Risk Factor for Developing Overweight and Obesity during Childhood and Adolescence?" *Journal of Biosocial Science* 38: 65-705.

McDonald J.T. and Kennedy, S. (2005), "Is Migration to Canada Associated with Unhealthy Weight Gain? Overweight and Obesity among Canada's Immigrants", *Social Science and Medicine* 1: 2469-2481.

Mora, P.A., Di'Bonaventura, M.D., Idler, E., Leventhal, E. and Leventhal, H. (2008), “Psychological Factors Influencing Self-Assessments of Health: Toward an Understanding of the Mechanisms Underlying How People Rate Their Own Health”, *Annals of Behavioral Medicine* 36: 292-303.

Mossey, J.M. and Shapiro, E. (1982), "Self-Rated Health: A Predictor of Mortality among the Elderly", *American Journal of Public Health* 72(8): 800-808.

Nagarajan, S. and Pushpanjali, K. (2008), "Self-Assessed and Clinically Diagnosed Periodontal Health Status among Patients Visiting the Outpatient Department of a Dental School in Bangalore, India", *Indian Journal of Dental Research* 19(3): 243-246.

Pew Research Center Report (2011), *The Future of the Global Moslem Population: Projections for 2010-2030*. Washington.

Parissis, J.T., Nikolaou, M., Farmakis, D., Paraskevaidis, I.A., Bistola, V., Venetsanou, K., Katsaras, D., Filippatos, G. and Kremastinos, D.T. (2009), "Self-Assessment of Health Status is Associated with Inflammatory Activation and Predicts Long-Term Outcomes in Chronic Heart Failure", *European Journal of Heart Failure* 11(2): 163-169.

Sen, A. (2002), "Health: Perception versus Observation", *British Medical Journal* 324(13): 860-861.

Smith, J.P. (1999), "Healthy Bodies and Thick wallets: The Dual Relation between Health and Economic Status", *Journal of Economic Perspectives* 13: 145-166.

van Doorslaer, E. and Gerdtham, U.G. (2003), "Does Inequality in Self-Assessed Health Predict Inequality in Survival by Income? Evidence from Swedish Data", *Social Science and Medicine* 57: 1621-1629.

van Praag B.M.S. and Ferrer-i-Carbonell, A. (2008), "Happiness Quantified. A Satisfaction Calculus Approach", Oxford University Press, New York.

United Nations, Department of Economic and Social Affairs (2013). Number of International Migrants Rises above 232 Million. At http://www.un.org/en/development/desa/news/population/number-of-international-igrants-rises.html

Wang, J.J., Mitchell, P., Simpson, J., Cumming, R.G. and Smith, W. (2001), "Visual Impairment, Age-Related Cataract and Mortality", *Archives of Ophthalmology* 119: 1186-1190.

Wolfers, J. (2003), "Is Business Cycle Volatility Costly? Evidence from Surveys of Subjective Well-being", *International Finance* 6(1): 1-26.

## Appendix

### A.1. Description/definition of variables

The independent variables include:

(i) *Immigrants' status*: Dummies for immigrants who arrived in the current country of residence 10 or less years ago, 11-to-20 years ago, and more than 20 years ago.

(ii) *Country-specific variables*: Logarithm of per capita GDP for origin and receiving countries; two continuous variables for the differences between home and host GDPs: Positive difference between origin and receiving GDPs and negative difference between origin and receiving GDPs. The first one is equal to the difference between origin and receiving GDPs (logarithm) if this difference is positive, and zero otherwise. The second one is equal to the absolute value of the difference between origin and receiving GDPs (logarithm) if this difference is negative, and zero otherwise.

*(iii) Socio-economic variables*

*Male:* a dummy variable that is set to 1 for male respondents.

*Age dummies:* For age we use four dummy variables, relating to the age groups of: 61-to-70; 71-to-80; 81-to-90; 91 and over; with the reference group being age of 50-to-60.

*Education:* Education is introduced by a dummy variable that equals 1 if the respondent has at least 13 years of schooling.

*Marital status, number of children in the household:* For ‘marital status’ we use 2 dummy variables: married and widowed, with the reference group including: divorced, separated and single respondents.

*(iv) Personal Medical variables*

*Medical diagnosis of health problems*: A set of dummy variables that relate to diseases that the individual was diagnosed with. They include: heart diseases, hypertension, vascular diseases, diabetes, lung diseases, arthritis, osteoporosis and cancer.

*Health symptoms:* A continuous variable that is the sum of different symptoms that the individual suffered from during the last 6 months (e.g., sleeping problems, falling down, persistent cough, fatigue, swollen leg, dizziness).

*Drug use:* A continuous variable that is the number of different drugs that the respondent takes at least once a week (e.g., drugs for high-cholesterol, high blood-pressure, joint pain, back pain, sleep problems, anxiety or depression, stomach burns).

*Medical consultation:* A continuous variable that is the response to the question: "During the last 12 months, about how many times in total have you seen or talked to a medical doctor about your health. Please exclude dentist visits and hospital stays, but include emergency rooms and outpatient clinic visits".

*Hospitalization:* A dummy variable that equals 1 if the respondent answered positively the question: "During the last 12 months, have you been in hospital overnight? Please consider stays in medical, surgical, psychiatric or any other specialized wards."

*Eyesight*: A continuous variable ranging from 1 (poor) to 5 (excellent). It is the average of 2 variables related to eyesight that are the responses to the question: "Your distance/reading eyesight is: poor (1)…excellent (5)".

*Alcohol use:* The survey includes the following question: "During the last 3 months, how often (during a standard week) have you drunk any alcoholic beverages, like beer, wine, spirits or cocktails?" The seven options range from 'not at all' to 'almost every day'. The following dummy variable is defined: it equals 1 if the respondent uses to drink at least 5 days a week.

*Obesity:* A dummy variable that is equal to 1 if the Body Mass Index (BMI, based on weight and height) is greater than 30.

*ADL:* This variable relates to limitations with basic activities of daily living (ADL). Six activities are included: dressing (including putting on shoes and socks), walking across the room, bathing or showering, eating (such as cutting up your food), getting in and out of bed, and using the toilet (including getting up or down). We use the individual's answer to these questions for the construction of a linear index, using the principal components analysis.

*IADL*: This variable describes the number of limitations with instrumental activities of daily living (IADL) reported by each individual. Seven activities are included: using a map to figure out how to get around in a new place, preparing a hot meal, shopping for groceries, making telephone calls, taking medications, doing work around the house or garden and managing money (such as paying bills). We use the respondent's answers to these questions to construct a linear index using the analysis of principal components.

*Cognitive skills: Identifying animals:* A continuous variable that is the number of animals that the individual listed in 60 seconds, in response to the question: "I would like you to name as many different animals as you can think of. You have one minute to do this."

**Table A.2: Descriptive Statistics, Natives and Immigrants, SHARE 2011**

| | NATIVES Mean (sta.dev.) | IMMIGRANTS Mean (sta.dev.) |
|---|---|---|
| Dep. Variable. SAHS (range of 1-5) | 2.77(1.07) | 2.59(1.11) |
| (i) Immigrant's status (%) | | |
| Up to 10 years since migration | - | 3.38 |
| 11 –to- 20 years since migration | - | 4.79 |
| 21 and over years since migration | - | 91.83 |
| (ii) Country variables | | |
| Logarithm of per capita GDP (receiving/host country) | 10.40 (0.52) | 10.37 (0.59) |
| Logarithm of per capita GDP (origin country) | - | 9.60 (0.95) |
| Positive difference between origin and host (log) GDPs | - | 0.032 (0.15) |
| Negative difference between origin and host (log) GDPs | - | 0.80 (0.89) |
| (iii) Socio-economic personal variables | | |
| Male (%) | 44.56 | 41.78 |
| Age in years (%) | | |
| 50-60 | 34.44 | 35.31 |
| 61-70 | 33.91 | 31.19 |
| 71-80 | 22.59 | 24.99 |
| 81-90 | 9.05 | 8.51 |
| more than 90 | 0.01 | 0.004 |
| Education | | |
| More than 12 years of schooling (%) | 29.56 | 32.30 |
| Marital status (%) | | |
| Married | 70.08 | 67.59 |
| Widowed | 14.40 | 15.37 |
| Number of children in household | 0.27 (0.62) | 0.30 (0.72) |

| | NATIVES Mean (sta.dev.) | IMMIGRANTS Mean (sta.dev.) |
|---|---|---|
| (iii) Personal Medical variables | | |
| Health conditions – diagnosed with..(%) | | |
| Heart problems | 13.73 | 17.01 |
| Hypertension | 39.74 | 42.20 |
| Cerebral vascular disease | 4.13 | 5.52 |
| Diabetes | 12.46 | 13.96 |
| Chronic lung disease | 6.51 | 8.08 |
| Arthritis | 24.20 | 28.02 |
| Osteoporosis | 1.44 | 1.37 |
| Cancer | 5.37 | 5.83 |
| Number of medical symptoms | 1.72 (1.79) | 2.07 (2.01) |
| Drug use (number of drugs) | 1.60 (1.67) | 1.71 (1.71) |
| Medical consultation (annual-number) | 6.75 (9.74) | 6.59 (9.70) |
| Hospitalization (%) | 15.34 | 16.48 |
| Quality of eyesight (range of 1-5) | 3.27 (0.98) | 3.16 (0.97) |
| Alcohol consumption (at least 5 days a week) | 21.90 | 15.57 |
| Obesity (BMI>30) | 21.62 | 23.28 |
| ADL | -0.10 (1.59) | -0.02 (1.65) |
| IADL | -0.12 (1.64) | -0.06 (1.65) |
| Number of remembered animals | 19.97 (7.69) | 18.92 (7.41) |
| (iv) Country shares in the sample (%) | | |
| Austria | 8.90 | 37.89 |
| Germany | 2.57 | 2.87 |
| Sweden | 3.25 | 3.37 |

| | NATIVES Mean (sta.dev.) | IMMIGRANTS Mean (sta.dev.) |
|---|---|---|
| The Netherlands | 4.79 | 2.35 |
| Spain | 5.37 | 1.57 |
| Italy | 7.06 | 0.75 |
| France | 9.72 | 10.96 |
| Denmark | 4.43 | 1.35 |
| Switzerland | 6.04 | 12.87 |
| Belgium | 9.21 | 8.50 |
| The Czech Republic | 11.41 | 5.00 |
| Poland | 3.37 | 0.77 |
| Hungary | 5.96 | 1.17 |
| Portugal | 3.29 | 1.21 |
| Slovenia | 4.84 | 6.09 |
| Estonia | 9.79 | 3.28 |
| Sample Size | 46,869 | 4,514 |