MIGRANT INTEGRATION POLICIES AND HEALTH INEQUALITIES IN EUROPE Margherita Giannoni -Department of Economics, University of Perugia (IT) and Institute of Economics, Università della Svizzera Italiana, Lugano (CH). email: margherita.giannoni@gmail.com Luisa Franzini - School of Public Health, University of Maryland (US). Email: franzini@umd.edu Giuliano Masiero - Department of Management, Information and Production Engineering, University of Bergamo (IT) and Institute of Economics, Università della Svizzera Italiana, Lugano(CH) . email: giuliano.masiero@usi.ch Corresponding author: Margherita Giannoni - Department of Economics- University of Perugia, Via Pascoli 20- 06123 – Perugia (ITALY) email: margherita.giannoni@qmail.com

21 Background

Research on socio-economic determinants of migrants health inequalities has 22 produced a large body of evidence. There is lack of evidence on the influence of 23 structural factors on lives of fragile groups, frequently exposed to health inequalities. 24 The role of poor socio-economic status and country level structural factors such as 25 26 migrant integration policies in explaining migrant health inequalities is unclear. The 27 objective of this paper is to examine the role of migrant socio-economic status and the impact of migrant integration policies on health inequalities during the recent 28 29 economic crisis in Europe.

30 Data and Methods

Using the 2012 wave of Eurostat EU-SILC data for a set of 23 European countries, 31 we estimate multilevel Logit models for: self-assessed poor health (SAH), self-32 33 reported limiting long standing illnesses (LLS) and self-reported chronic illness (SC). We estimate two-level logistic regression models with individuals nested within 34 countries, allowing for both individual socio-economic determinants of health and 35 country-level characteristics (healthy life years expectancy, proportion of health care 36 expenditure over the GDP, and the number of problems in migrant integration 37 policies, derived by the Migrant Integration Policy index). We complement the 38 global analysis based on all countries, with a two-steps analysis at country level. 39

40 **Results**

Socio-economic health inequalities are persisting in Europe in time of crisis. Being non European citizen or born outside Europe increases the odds of reporting poor health conditions. The country's context in terms of problems in migrant integration influences negatively self-reported health status and limiting long standing illnesses of foreign people living in European countries and offsets the "healthy migrant" effect in the case of chronic conditions.

47 Conclusions

48 Policies for migrant integration can reduce migrants health disparities.

50 policy integration, migration and health in Europe

51 Background

Achieving health equity through tackling health inequalities has been included 52 among the measures of health systems performance by the World Health 53 Organization [1]. Research on socio-economic determinants of health inequalities in 54 general, and on migrants health inequalities, in particular, has produced a large body 55 of evidence mainly for the US and Europe. According to the social determinants of 56 57 health perspective, it is generally acknowledged that social and economic policies 58 can be considered as health policies [2][3]. In Europe, a large body of evidence has been produced on socio-economic inequalities in health, starting from Whitehall 59 Studies in the 1980s showing that even among white-collar employees with steady 60 61 jobs there is a clear social gradient in health [4]. At the same time, the European Union has encouraged action in many countries providing a framework and the 62 principles to tackle health inequalities[5]. The existing evidence showed that socio-63 economic health inequalities are persisting in European countries [5] [6]. Overall, the 64 persistence of socio-economic health inequalities reinforced the importance of 65 policies aiming at improving opportunities for full social participation as key factors 66 for good health that has been the focus of main policy documents at all levels 67 [7][8][8][9]. On the other hand, as for the U.S. case[3], there is a lack of evidence 68 69 also for Europe on how structural factors, such as migrant integration policies, influence the lives of fragile groups such as migrants, that typically are subject to 70 socio-economic health inequalities[10]. A recent survey on migrants health in Europe 71 showed that despite the fact that they are often comparatively healthy, described in 72 73 the literature as "healthy migrant effect", nevertheless they suffer from health 74 inequalities[<u>11</u>][<u>12</u>]. Moreover, despite the fact that migration in itself is increasingly recognized as an independent social determinant of health[13], the 75 76 correlation often found between migration background and lower socio-economic

78 health inequalities, although poorer socio-economic conditions could be derived by social exclusion mechanisms that characterize migrant status and ethnic 79 80 origin[<u>14][15</u>]. Other studies reported that migrants living in countries that show poor integration policies experienced poorer socio-economic and health outcomes, but 81 82 did not estimate the effects of the socio-political context of immigrants' integration on health[16]. Further evidence is therefore needed in order to better address the 83 development of interventions that promote healthy integration of immigrants into 84 European society. Moreover it seems important to verify with more recent data if 85 migrant status can be considered an autonomous and significant determinant of 86 health inequalities in the E.U., after controlling for the other socio-economic 87 88 determinants, such as income and education. Using 2007 cross sectional data from 89 the Eurostat EU-SILC dataset for a set of 14 countries for which there were available data [¹⁷], we showed that before the crisis being a non-EU citizen and living in the 90 91 EU seems not to be a significant determinant of self-assessed health inequalities 'per se'. What matters seems to be the fact of living in a country where there are 92 problems in terms of migrant integration policies. This study provides an updated 93 empirical analysis on the role of migrant status and migrant policies as 94 determinants of health inequalities in a wider set of European countries. The first 95 aim is to test with more recent data the role of migrant status as a determinant of 96 health inequalities. Moreover, as the Migrant Policy Integration Index (MIPEX) was 97 updated for 2010, it seems important to test if migrant integration policies continued 98 to influence health inequalities in the E.U. and to re-evaluate the issue in light of the 99 100 economic recession occurring after 2009 in Europe, which has been associated with a 101 worsening of health inequalities in several countries, as, e.g. Greece[18]. As health 102 inequalities are driven by socio-economic status (SES) it seems reasonable to expect 103 that results obtained for 2007 would be reinforced, thus strengthening the argument 104 that migrant integration policies are needed in order to tackle inequalities in health.

106 The conceptual model for the first step of the analysis is drawn from previous analyses [17] and it is shown in Figure 1. The theoretical framework is based on 107 socio-ecological models that consider that self assessed health is affected by a large 108 set of determinants at multiple levels, the most important being: socio-economic 109 factors, social and physical environments, healthcare, and health behaviors[19]. 110 Being a non European citizen or non- born in Europe, as a proxy for migrant status, 111 112 is considered one of the socio-economic determinants of health acting at the individual or family level[20]. At the group level, socio-economic factors contribute to 113 unequal social and physical environmental exposures which contribute to health 114 inequalities[21]. In this context, the aim is to test if migrant policies affect the socio-115 economic context in which both migrants and non-migrants live. If individuals live in 116 117 a country where there are problems in terms of granting rights to migrants, this could reasonably negatively affect the way they live in this country and, ultimately, 118 119 their health. This approach can be used in the present analysis by considering country policies towards migration as a component of social environment in which 120 both migrants and non-migrants live. Therefore migrant policies are introduced at 121 the country level using a migrant integration Policy variable in order to explain 122 observed socio-economic inequalities in health. Migrant integration policies at 123 country level could influence health through several pathways. They are part of the 124 125 social context of the country in which individuals live, and as such they can affect the health of all people living in the country. Furthermore, their specific interaction 126 with the status of non-EU citizenship, can affect migrants health status at the 127 individual level, such as other individual socio-economic determinants as income, 128 occupation, education (etc.) (figure 1). 129

We used multilevel models with a dataset of individual observations made available by Eurostat through the 2012 wave of EU-SILC cross-sectional data[<u>22</u>]. Using multilevel models allows to estimate statistically the proportion of the variation in

health at both individual and country level, as well as country level unobserved 134 135 factors[17]. Moreover, by using multilevel modeling it is possible to introduce simultaneously individual level variables and more general country level factors, 136 such as in our case country specific policies and attitudes on migration, which would 137 138 influence health. The use of cross-sectional data has its own limitations, which however the use of multilevel technique partly overcomes. In this case it has been 139 chosen not to use the longitudinal survey, as information on citizenship status or 140 country of birth were not widely available as in the cross sectional waves and were 141 142 not always representative at country level, moreover the cross-sectional data are richer than the longitudinal in terms of information recorded, as not all variables 143 available in the cross sectional waves are present in the longitudinal version of the 144 EUSILC. For each response variable, we carried out two analyses: a global analysis 145 146 and a two-steps analysis. The global analysis involves the entire study sample and treats self-reported measures of health status as a dependent variable. Due to the 147 multistage sampling design used to collect the data and considering the binary 148 nature of the response variables, to estimate the association between health and its 149 determinants, we used a set of two-level multilevel logistic regression models with 150 individuals nested within European countries. For the first step of the analysis, 151 multilevel logit models were estimated for three dependent variables: self-assessed 152 153 poor health, self- reported limiting severe or very severe long standing illnesses and 154 self-reported chronic illness. These models allow to determine the direct effect of the individual and group explanatory variables, as well as the interactions between 155 levels[23]. 156

The multilevel logistical regression model establishes that the dependent variable, Yij, follows a Binomial distribution of the form Yij~Binomial(1,pij) with conditional variance var $(y_{ij} | \pi_{ij}) = \pi i j (1 - \pi_{ij})$, where $\pi i j$ is the probability of reporting the characteristic of interest for individual *i* of country *j* and:

$$logit(yij) = \beta 0 + \sum_{K=1} \beta k X k i j + \sum_{h=1} \beta h Z h j + \mu 0 j + e i j$$
(1)

162 Where:

 X_{kii} are the K demographic and socio-economic explanatory variables at individual 163 level (level 1), and Z_{hj} are the H explanatory variables at country level (level 2). The 164 error term divides the unexplained part in two parts, one corresponding to level 1 165 166 and the other to level 2. Further models are also estimated adding the interactions among the significant ecological variables and the significant individual 167 characteristics in order to analyse their differential influence over health. In our 168 case, the aim is to check if the number of problems in policies for migrants 169 integration at country level influence non-European born or non-European citizens' 170 health differently than local citizens' health. The first part of the analysis is based on 171 cross-sectional micro-data from Eurostat, EU-SILC, reference year: Cross Sectional 172 2012[22]. Participants were adults regularly residents in European countries. 173 174 Countries for which citizenship status and country of birth was recorded and representative at population level were selected from the sample ^a. The final sample 175 selected had 375,110 observations grouped in 23 countries. Table 1 shows the 176 summary statistics for individual and country variables used. The three dependent 177 variables modelled are: self-assessed poor healt, self-reported limiting severe or 178 very severe long standing illnesses and self-reported chronic illness. Self-assessed 179 health was measured by the answer to the question "How is your health in general? 180 Is it...". Respondents selected from a scale of five options: very good, good, fair, bad 181 182 and very bad. For the purpose of this study, responses were condensed into a dichotomous variable taking the value of 1 in case of poor or very poor self-assessed 183 health (SAH.) SAH is one of the most widely used indicators of health in survey 184 research and recommended both by the World Health Organisation and the European 185 Union Commission. Evidence showed that SAH is a strong and independent predictor 186 of morbidity and mortality, as there was an association between SAH and mortality 187

Therefore, the analysis looks at the risk factors of SAH as measure in and of itself. 189 To complement the analysis we included also other measures of health: limiting long 190 191 standing illness and chronic diseases. Limiting long standing illness was measured by the answer to the question: "For at least the past 6 months, to what extent have 192 193 you been limited because of a health problem in activities people usually do? Would 194 you say you have been ... "Respondents selected from a scale of three options: severely limited, limited but not severely or not limited at all. For the purpose of this 195 study, responses were condensed into a dichotomous variable taking the value of 1 196 in case of reported either severe or limiting but not severely limiting conditions. 197 Chronic illness was measured by the yes or no answer to the question: "Do you have 198 *any longstanding illness or [longstanding] health problem?"*.^b. The individual 199 independent variables correspond to socio-demographic (age, sex, marital status 200 and nationality) and socio-economic (educational level, personal income and 201 202 employment status) dimensions. Education was measured as the highest ISCED 203 level attained. The variable for low education is a dummy variable that takes the value of one if the individual attained up to a lower secondary level of education and 204 zero otherwise. The reference individual is a married woman aged 47 with a 205 medium-high level of education (i.e. six years or more of schooling) who works as 206 employee in 2012. This approach allows to identify which of the variables are 207 significant and to differentiate between the effects of self-assessed health, presence 208 209 of health limitations and chronic illness with respect to the reference individual. In 210 order to measure Migrant Integration Policies across European countries we used 211 MIPEX data for 2010, the last available year of the survey[25]. The MIPEX project is today led by CIDOB and the Migration Policy Group and it includes up to 37 national-212 level organisations, including think-tanks, non-governmental organisations, 213 foundations, universities, research institutes and equality bodies and research 214 215 activities are coordinated by the Migration Policy Group in cooperation with the

areas: labour market mobility, family reunion for third country nationals, political 217 218 rights, long term residence, access to nationality, anti-discrimination policies. Mipex 219 indicators are reported on a 0-100% scale calculated for each policy area, where 100% is the top score. In order to build up a composite measure of migrant 220 policies, we developed an Index of problematic Migrant Health Policy based on 221 MIPEX data available. The index measures for each country the number (from 0 to 222 223 6) of policy areas which appear on average problematic in 2010, i.e. those ranked with a value less than 50% in MIPEX. We tested for several specification of the 224 MIPEX, by grouping with factor analysis the various dimensions of MIPEX, as well as 225 226 for the separate inclusion of sub-dimensions as independent variables in the models. However, the best and parsimonious specification, that is also useful for interpreting 227 228 results, was obtained by using the index of problematic dimensions as it was for the previous analysis done for 2007. According to this index data, countries such as 229 230 Finland, The Netherlands, Portugal, Finland and Sweden appear to be not problematic on average, whereas Latvia shows the higher number of problematic 231 policy areas, followed by Greece, Switzerland, Estonia and Malta (Figure 2). 232 233 Moreover, estimation was performed by controlling for country level characteristics for both the health care system and the economy. A set of variables at country level 234 were taken from OECD Health Data and from Eurostat country level statistics in 235 order to control for health and health care system characteristics and were tested, 236 237 namely: Gini index for income inequality, Poverty rates, Pollution rates, homicide 238 rates, number of hospital beds over 1000 inhabitants, proportion of immigrant resident in the country over the total population, per capita GDP, proportion of total 239 health care expenditure over the GDP, Healthy life years expectancy, index of 240 corruption levels in the country. Out of these variables, only two resulted to be 241 significant in some models, namely: healthy years life expectancy and the proportion 242 of health care expenditure over the GDP[26] [27]. Therefore, results reported are 243 244 obtained by controlling for these variables. Interestingly, the policy variable and its

allowing for country level characteristics.

247 **Results and Discussion**

248 Results from the estimation of multilevel Logit models are reported in Table 2. Six 249 models were estimated. Model 0 is the null model. Model 1 adds on the individual 250 demographic and socio-economic determinants. The probability of reporting poor health is affected by socio-economic determinants as the empirical literature 251 highlights, with income, employment status, and high educational levels affecting 252 negatively the probability. Model 2 adds the country level characteristics, healthy life 253 years expectancy and the proportion of health care expenditure over the GDP. Both 254 255 these variables seem to exert a protective effect on health. Living in a country with 256 higher healthy years life expectancy and proportion of total expenditure on GDP decreases the odds of reporting poor health. Model 3 adds the country level variable 257 measuring problems in migrant integration policies which does not however appear 258 to be significant. Instead, similarly to past results obtained for 2007 data, the odds 259 of reporting poor health are increased by 25% by the fact of being a non-EU country 260 citizen or non-EU born in Models 1-3 (Table 2). However, results from Model 4 in 261 Table 2, where the interaction term between the non EU citizenship status and the 262 263 policy variable measuring the number of problematic migrant policy areas at country level, show that the effect on health exerted by the status of being a non 264 EU citizen is not important 'per se'. The dummy for the non EU citizenship becomes 265 no more significant once the policy variable is introduced. This indicates that the 266 267 negative effect of being a non-EU citizen on health is mediated by the fact of living in countries where acquisition of citizenship, electoral rights, political liberties and anti-268 269 discrimination policies are unfavorable to migrants. Model 5 results obtained by 270 using all variables show that the two variables are not individually significant any 271 more once their interaction term is introduced. In both Model 4 and Model 5 being a non EU citizen and living in countries where there are problems in terms of 272

274 to the reference local citizen. There is a significant interaction effect between the country-level variable measuring the number of problematic migrant policy areas for 275 the country and the individual-level variable status of non EU citizen or born cross-276 level interaction suggesting that the negative effect of being non EU citizen 277 becomes stronger as the number of problems in integration policies increases (Table 278 2). To check for the robustness of the finding, we performed a two-steps analysis 279 280 and reported also estimates at country level. In the first step, separate country 281 estimates were obtained by running Logit models for the probability of reporting 282 poor or very poor health using only individual level variables. By plotting the estimated slopes of the dependent variable for the non EU citizen status from the 283 first step against the country-level variable for problems in migrant integration 284 285 policies, it is possible to visualize the interaction effect (figure 3).

Results for the estimation of the probability of reporting limitations in daily life are 286 shown in Table 3. There is an analogous pattern with respect to results obtained for 287 the probability of reporting poor or very poor health. In this case the impact on 288 289 health derived from the fact of being a non EU citizen or born seem to be lower. 290 From both Model 4 and Model 5 results it appears that being a non EU citizen and living in countries where there are problems in terms of integration policies increases 291 292 the odds of reporting limitation in daily life with respect to the reference local citizen individual. Table 4 report results from the estimation of multilevel logit models for 293 the probability of reporting chronic conditions. Looking at the first four models the 294 non EU citizen/born has no significant effect on the probability of reporting chronic 295 296 conditions, as well as the overall variable measuring problems in integration.

However, Models 4 and 5 show that, once the interaction term is introduced in the estimation, the status of non EU citizen appear to be associated with a 13% lower odds of reporting chronic diseases with respect to the reference individual. This could be a reflection of the healthy migrant hypothesis. On the other hand, similarly to the

302 living in countries where there are problems in terms of integration policies increases the odds of reporting limitation in daily life with respect to the reference local citizen 303 304 individual. The two-steps analysis for the probability of reporting limitations in daily 305 life and for the probability of reporting chronic conditions confirmed results (additional file N.2, additional file N.3). Compared with previous results obtained 306 using 2007 wave of Eurostat EU-SILC data for a set of 14 European countries, 307 308 results show that socio-economic health inequalities are persisting in time of crisis 309 and driven by socio-economic status(SES). As expected, individual determinants affect poor health, as shown elsewhere [4][5][6][7][9][19], as well as by our previous 310 results obtained for the year 2007[17]. Health decreases with age and increases with 311 education; non married individuals report worse health than married individuals; and 312 313 those who work, either as employee or self-employed, report better health than those who are not working. Among SES it was found that being a non European 314 315 citizen or born outside the EU increases the odds of reporting poor health conditions. However, it was found that particularly for SAH the effect of being a non European 316 citizen/born is not important per se, but that it is the country context in terms of 317 problems in migrant integration that influences negatively self-reported health 318 status of foreign people living in European countries. This result holds even allowing 319 for country characteristics and for more objective measures of health status, such as 320 321 the limitations in daily life and the presence of chronic conditions. In this latter case the effect of living in a country with problems in migrant integration can offset the 322 "healthy migrant" effect. Finally, this work so far has relied upon the use of 323 324 individual cross-sectional surveys of the EUSILC dataset, we could not use the panel as not all variables where available in the panel version. In order to try to overcome 325 this limitation, further analysis is ongoing by exploiting the whole pseudo-panel of 326 cross-sectional data. 327

- 329 We examined health inequalities in a set of European countries, allowing for both
- individual socio-economic determinants of health and country-level characteristics
- including migrant integration policies, derived by the Migrant Integration Policy
- 332 Index. This work adds on existing evidence that, among policies aimed at reducing
- 333 health disparities in time of economic crisis, there are overall policies for non-
- 334 European migrant integration. Our findings reinforce the view that migrant
- integration policies are needed in order to tackle inequalities in health and ultimately
- to improve equity in health.
- 337 List of abbreviations used
- 338 LLS- self- reported limiting long standing illnesses
- 339 MIPEX Migrant Integration Policy Index
- 340 SAH- Self Assessed Health
- 341 SC-self-reported chronic illness
- 342 SES Socio-Economic Status
- 343 EU- European Union

344 **Competing interests**

345 The authors declare that they have no competing interests.

346 Authors' contributions

- 347 MG participated in the design of the study, performed the quantitative analysis and
- 348 drafted the manuscript. LF participated in study design and statistical methodology
- 349 and helped to draft and review the manuscript. GM within the Università della
- 350 Svizzera italiana (CH) and the University of Bergamo (IT) funded the data and
- 351 participated in the design and the review of the study.
- 352 All authors read and approved the final manuscript.

353

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366 He has worked extensively on the micro-econometric analysis of health care

367 utilization.

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385 authors.

386 Endnote

- a. We excluded Iceland, because no MIPEX data were available for this country.
- 388 Moreover, observations for Poland and Norway needed to be excluded from the
- initial sample, due to the presence of several missing data on citizenship.
- 390 Similarly, Cyprus, Czech republic and Slovenia were excluded from the analysis
- 391 because of data limitations affecting robustness of results.
- b. Table A1 (additional file n.1) shows country level proportions of observations on
- total sample for Non-EU citizens or born outside the EU as well as for the
- dependent variables used.

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- 489 Illustrations and figures
- 490 **Figure 1 The conceptual model**
- 491 < Figure 1 ABOUT HERE>
- 492 Source: adapted from Franzini and Giannoni [23]
- 493 Figure 2: N. of problematic areas in migrant integration policy by country
- 494 < Figure 2 ABOUT HERE>
- 495 Source: our calculation based on Mipex[26] data for 2010
- 496 Figure 3: Two stage Logit estimation Results Estimated country level
- 497 average probability of reporting poor or very poor health vs number of
- 498 problematic areas of migrant integration policies year: 2012
- 499 < FIGURE 3 ABOUT HERE>
- 500 Source: our calculation based on EUROSTAT, OECD, MIPEX data
- **502** Tables and captions

Description	Data source	Mean	Std.Dev.	Min	Max
Individual level:					
gender: =1 if male, 0 otherwise	EU-SILC 2012 C.S. wave	0.476178	0.499433	0	1
Age	EU-SILC 2012 C.S. wave	48.5277	18.14399	16	80
Age squared	EU-SILC 2012 C.S. wave	2684.141	1779.72	256	6400
Low education: =1 if highest ISCED level up to	EU-SILC 2012 C.S. wave	0.331124	0.470618	0	1
seconday lower education level, 0 otherwise					
unemployed: =1 if unemployed, 0 otherwise	EU-SILC 2012 C.S. wave	0.068047	0.251826	0	1
Student: =1 if student, 0 otherwise	EU-SILC 2012 C.S. wave	0.082093	0.274507	0	1
Retired or Unable to work: =1 if retired or	EU-SILC 2012 C.S. wave	0.279009	0.448513	0	1
unable to work, 0 otherwise					
housework:=1 if housework, 0 otherwise	EU-SILC 2012 C.S. wave	0.069321	0.254	0	1
Self-employee: =1 if self-employed, 0 otherwise	EU-SILC 2012 C.S. wave	0.068633	0.25283	0	1
Marital status: =1 if Not married; 0 otherwise	EU-SILC 2012 C.S. wave	0.285514	0.451659	0	1
Widow=1 if widowed, 0 otherwise	EU-SILC 2012 C.S. wave	0.08288	0.275701	0	1
Separated or divorced: =1 if separated or	EU-SILC 2012 C.S. wave	0.077161	0.266848	0	1
divorced, 0 otherwise					
Foreign Non EU citizen or non EU born: =1 if	EU-SILC 2012 C.S. wave	0.05898	0.235588	0	1
citizen of a NON EU country or was born in a					
non EU country, 0 otherwise					
Log of individual income (equivalised with	EU-SILC 2012 C.S. wave	9.350764	1.14694	0	14.61408
OECD scale)					
Country level (n. countries =23):					
% Health Care exp on GDP	Eurostat Statistics (*)	9.088744	1.966225	5.11147	12.43709
Healthy life years(**)	Eurostat Statistics(*)	61.67585	4.226581	53.25	72.1
N of Ducklountie man of Internation Delien	MIDEV Jata	1 09295	1 201424	0	5
(as measured by MIPEY 2010date)	(www.miner.en)	1.70303	1.371434	U	5
Interaction term · (N of Problematic areas of	(ттт.пирел.ец)	0 14428	0 696486	0	5
Integration Policy * Foreign Non FU citizen or		0.17720	0.070400	v	5
non EU born)					

505 (*) available at :http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database last accessed 18th

506 August 2014.

- 508 expected to live without any severe or moderate health problems. The notion of health problem for Eurostat's HLY is
- 509 reflecting a disability dimension and is based on a self-perceived question which aims to measure the extent of any
- 510 limitations, for at least six months, because of a health problem that may have affected respondents as regards activities they
- 511 usually do (the so-called GALI Global Activity Limitation Instrument foreseen in the annual EU-SILC survey). The

513 mortality data with health status data.

^{507 (**)}The indicator of healthy life years (HLYs) measures the number of remaining years that a person of specific age is

⁵¹² indicator is therefore also called disability-free life expectancy (DFLE). HLY is a composite indicator that combines

Table 2- Multilevel Logit estimates for the probability of reporting poor or very poor health – Odds Ratios- Year: 2012 (*) 514

Dependent variable : Poor or very poor Self Assessed Health(SAH)	MODEL 0	MODEL 1	MODEL2	MODEL 3	MODEL 4	MODEL 5
Description	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios
Individual level 1 variables:						
gender		0.954294	0.954377	0.954377	0.954337	0.9543328
Age		1.113188	1.113198	1.113198	1.112935	1.112934
Age squared		0.999576	0.999576	0.999576	0.999578	0.9995779
Low education		1.982104	1.982943	1.982943	1.982455	1.982418
unemployed		1.069274	1.069993	1.069993	1.06986	1.069854
housework		0.904859	0.905425	0.905425	0.90548	0.9054857
Self-employee		0.431763	0.431657	0.431657	0.431863	0.4318592
Not married		1.535984	1.536123	1.536123	1.537956	1.537956
Widow		1.291843	1.291622	1.291622	1.291291	1.291295
Separated or divorced		1.454898	1.454966	1.454966	1.455711	1.455707
Log of individual income		0.832224	0.901648	0.832736	0.832611	0.8326051
Non EU citizen or born outside the EU		1.252934	1.252834	1.252834	1.02733	1.027182
Country level 2 variables:						
%Health Care exp on GDP			0.937652	0.901007	0.903446	0.9020474
Healthy life expectancy			0.832739	0.937752	0.937968	0.9381885
N. of Problems with Migrant Integration Policies			0.544479			0.9897393
Interaction term :						
N. of Problems with Migrant Integration Policies * Non EU citizen or born						
outside the EU					1.074356	1.07443
Constant	0.108534	0.004058	0.544479	0.550055	0.528213	0.5400761
In_sigma_u	-0.9100663	-1.1708	-1.98278	-1.98313	-1.97021	-1.97183
sigma_u	0.6344269	0.556882	0.371061	0.370995	0.373399	0.3730977
rho	0.109008	0.086144	0.04017	0.040157	0.040658	0.0405947
(*) Coefficients in hold are statistically significant at least at 5% - Data source: E	IIrostat EUSI	C cross se	ctional – v	rear: 2012- c	countries: 2	~

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Table 3- Multilevel Logit estimates for the probability of reporting limitations in daily life – Odds Ratios- Year: 2012 (*)

Dependent variable : Health Limitations	MODEL 0	MODEL 1	MODEL2	MODEL 3	MODEL 4	MODEL 5
Description	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios .	Odds ratios .
Individual level 1 variables:						
gender		0.886905	0.886974	0.886974	0.886842	0.886846
Age		1.064944	1.064947	1.064947	1.064844	1.064847
Age squared		0.999934	0.999934	0.999934	0.999935	0.999935
Low education		1.612235	1.612726	1.612726	1.612115	1.612239
unemployed		1.083505	1.083739	1.083739	1.083622	1.083656
housework		0.916659	0.917203	0.917203	0.917326	0.91729
Self-employee		0.667309	0.667347	0.667347	0.667584	0.667597
Not married		1.42138	1.421498	1.421498	1.422174	1.422138
Widow		1.388768	1.388759	1.388759	1.388419	1.388373
Separated or divorced		1.387465	1.387593	1.387593	1.387894	1.387867
Log of individual income		0.866993	1.015389	0.867303	0.867248	0.867283
Non EU citizen or born outside the EU		1.041008	1.04119	1.04119	0.944391	0.944984
Country level 2 variables:						
%Health Care exp on GDP			0.921737	1.025683	1.016275	1.026111
Healthy life expectancy			0.867266	0.920332	0.921921	0.920577
N. of Problems with Migrant Integration Policies				1.069444		1.066264
Interaction term : N. of Problems with Migrant Integration						
Policies * Non EU citizen or born outside the EU					1.039074	1.038765
Constant	0.2991804	0.039128	5.279261	4.568295	5.186635	4.517638
In_sigma_u	-1.503371	0.338193	0.324024	-2.17073	-2.24875	-2.24875
sigma_u	0.471571	0.556882	0.371061	0.337779	0.324856	0.324856
rho	0.0633154	0.033598	0.030927	0.033518	0.031081	0.031081
(*) Coofficiants in hold are statistically significant at locat at 50/		Duroctot EII	CIT C MADE	2012 CIUC	triag. 72	

(*) Coefficients in bold are statistically significant at least at 5% - Data source: Eurostat EUSILC- year: 2012- countries: 23

Table 4- Multilevel Logit estimates for the probability of reporting chronic diseases –0dds Ratios- Year: 2012 (*)

Dependent variable : Chronic conditions	MODEL 0	MODEL 1	MODEL2	MODEL 3	MODEL 4	MODEL 5
Description	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios
Individual level 1 variables:						
gender		0.905012	0.905031	0.905031	0.904866	0.904866
Age		1.068635	1.068633	1.068633	1.068491	1.068492
Age squared		0.999894	0.999894	0.999894	0.999895	0.999895
Low education		1.438153	1.438198	1.438198	1.437449	1.437465
unemployed		1.03175	1.031682	1.031682	1.031466	1.03147
housework		0.875514	0.875608	0.875608	0.875803	0.875794
Self-employee		0.661525	0.661479	0.661479	0.661857	0.661858
Not married		1.319191	1.31919	1.31919	1.320000	1.320004
Widow		1.253213	1.253228	1.253228	1.252821	1.252817
Separated or divorced		1.264107	1.264109	1.264109	1.264524	1.264525
Log of individual income		0.909923	0.909835	0.909844	0.909822	0.909829
Non EU citizen or born outside the EU		1.002074	1.002186	1.002186	0.878805	0.878922
Country level 2 variables:						
%Health Care exp on GDP			1.084398	1.088246	1.085552	1.088755
Healthy life expectancy			0.966179	0.96566	0.966429	0.965997
N. of Problems with Migrant Integration Policies				1.023862		1.019817
Interaction term :						
N. of Problems with Migrant Integration						
Policies * Non EU citizen or born outside the EU					1.052103	1.052038
Constant	0.4784685	0.043559	0.17833	0.16952	0.174428	0.167232
In_sigma_u	-2.355487	0.424342	0.378645	-1.95055	-1.95288	-1.95864
sigma_u	0.3079728	0.556882	0.371061	0.377088	0.37665	0.375567
rho	0.0280222	0.051893	0.04176	0.041432	0.041339	0.041112
(*) Coefficients in hold are statistically significant at least	st at 5% - Data	source: Furostat	FUSH C- Vea	rr. 2012- countries.	23	

522 Additional file -N.1

- 523 File name : Additional file N.1.xls
- 524 File format : excel
- 525 Title of data: Table A1
- 526 Description of data: %population in sample and by citizenship status
- 527 (local & EU citizens vs Non-EU citizens/ Non-EU born)
- 528 proportion of people reporting self-reported poor or very poor health
- 529 (SAH), limitations in daily life, chronic diseases

530 Additional file -N.2

- 531 File name : Figure 4.pdf
- 532 File format : .acrobat
- 533 Title of data: Figure 4: Two stage Logit estimation Results -
- 534 Estimated country level average probability of reporting
- 535 limitations in daily life vs number of problematic areas of migrant
- 536 integration policies- year: 2012

537 Additional file -N.3

- 538 File name : Figure 5.pdf
- 539 File format : .acrobat
- 540 Title of data: Figure 5: Two stage Logit estimation Results -
- 541 Estimated country level average probability of reporting chronic
- 542 conditions vs number of problematic areas of migrant integration
- 543 **policies year: 2012**





Source: adapted from Franzini and Giannoni (2010)





Source: our calculation based on MIPEX data for 2010.



Additional files provided with this submission:

Additional file 1: Additional file - 1.xlsx, 11K http://www.biomedcentral.com/imedia/2128977941784177/supp1.xlsx Additional file 2: figure 4.pdf, 109K http://www.biomedcentral.com/imedia/1385303518178500/supp2.pdf Additional file 3: figure 5.pdf, 111K http://www.biomedcentral.com/imedia/1699171746178500/supp3.pdf