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Immigration and the utilization of preventive care in Europe: Results from retrospective data

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Abstract: We used retrospective information from the Survey on Health, Ageing and Retirement in Europe (SHARE) to analyze the utilization patterns of preventive care around the time of migration of a representative sample of migrants in Europe. We find heterogeneous behaviours across different types of preventive care. Migrants increase the utilization of dental care significantly as soon as they reach the host country compared to the years immediately before migration, while migrant women increase their use of blood pressure tests, gynaecological visits, and mammogram tests progressively after migration. Other types of care do not exhibit particular patterns in relation to the migration episode. We also observe relevant differences in preventive care use around migration by country of origin. Our results suggest that preventive care use by migrants cannot be given for granted and is intimately linked to the process of integration in the host country.

Keywords: Immigration, Preventive care, SHARE, event study

JEL Codes: I12, I14, J15

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Introduction

Immigration to Europe has increased dramatically during the past thirty years, and it is very unlikely that this trend will diminish or reverse in the near future. European recent statistics report that, at the beginning of 2019, the number of people living in the EU-27 who were citizens of non-member countries was 20.9 million, while the number of people living in the EU-27 who had been born outside of the EU was 34.2 million[1].

Although existing literature includes extensive studies on the effect of immigration on many economically relevant dimensions (such as the labour market, politics, fiscal contributions and demography), sparse rigorous evidence exists on how immigrants perform in host countries in terms of healthcare use.

One strand of literature in this sense relies on the Andersen's behavioural model of health services use and further developments (Andersen, 1968; Andersen, 1995; Aday & Awe, 1997). Andersen distinguishes among three categories of factors that may influence the individuals' choices regarding the use of health services: predisposing (such as age, gender, education, ethnicity, health beliefs), enabling (for example wealth, income, health insurance), and need. Several papers attempted to assess the impact of these factors on the individuals' demand for health services.

However, with respect to immigrants, available research is mainly concentrated on exploring the effect of immigration on access to health care services such as emergency care, hospitalizations, and primary care, putting an emphasis on differences in the use of such services among migrant and non-migrant populations. Most studies have mainly focussed on long-standing host countries, particularly the USA and Canada (Currie & Joseph Hotz, 2004; Hargraves & Hadley, 2003; Leclere et al., 1994; Pylypchuk & Hudson, 2009; Pylypchuk & Sarpong, 2013) while for Europe the evidence is scanter due to a lack of reliable information on health conditions, access to health services and health-related expenditure of immigrants relative to locals/natives (Cots et al., 2007; Davies et al., 2009; Devillanova & Frattini, 2016; Gravelle et al., 2003; Morris et al., 2005). Most of the existing studies obtain similar results. In

[1]See: https://ec.europa.eu/info/strategy/priorities-2019-2024/promoting-our-european-way-life/statistics-migration-europe_en

general, immigrants (i) seem to spend less on health care services than natives (Goldman et al., 2006), (ii) are more likely to use emergency care and hospitalization services and (iii) are less likely to regularly visit general practitioners and specialists and use preventive care (Graetz et al., 2017; Rechel et al., 2012), Still, that there are some differences in the findings between US and other host countries (Uiters & al, 2009).

Existing studies establish that, besides the factors that are generally considered as determinants of the individuals' behaviour/choices with respect to the use of health services, other barriers should be considered when exploring the health care utilization by migrants (Erdsiek, Waury and Brzoska, 2017). Still further studies are needed in order to identify them and allow for designing and implementing policy measures that to break down/mitigate such obstacles.

Despite the increasing attention towards the use of specific health care services by foreigners, little is known so far on the impact of acculturation and on the immigrants' use of preventive care. Preventive care can save health care costs (Russell, 2007) and maintain long-term health amongst individuals. Previous studies found that preventive care, including dental check-ups (Oscarson et al., 2007), can help reduce health complications. Understanding immigrants' utilization of preventive care can have important implications for the sustainability of health care systems in the host countries. If immigrants forgo preventive care and resort to health care only for acute illnesses, they may be more severely ill when they receive care in the short run and may face deterioration to overall health in the long-run, and both outcomes could be very costly (Pylypchuk & Hudson, 2009).

In this paper, we attempt to fill the gap by exploring how migration episodes influence the utilization of preventive care by individuals over their lifespan, using retrospective data drawn from the third and seventh waves of the Survey of Health Ageing and Retirement in Europe. Differently from prior studies, we focus on a subsample of only immigrants living in European countries and examine the trajectories in the utilization of preventive care before and after the migration event. The advantage of using data from retrospective interviews is that we can observe the behaviour of migrants before and after migration, i.e. in their country of origin and in the host country, and compare them. Moreover, we have information spanning the entire lives of respondents; therefore, we can observe the behaviour of

individuals migrating at different ages, from adolescence to old age. We consider individuals born from the 1920s to 1970s and focus on migrants coming from Western and Eastern Europe. From a historical perspective, between 1950 and 1990, about 12 million people migrated from Eastern Europe to Western European countries (Fassmann & Munz, 1992), many of them to Germany, changing their cultural and institutional settings dramatically. Indeed, the two macro-regions showed important differences in terms of culture, institutions, and health systems, which may affect the utilization of preventive care services. For instance, former Socialist countries were characterized by a "free" care system, in which the use of preventive services – mainly provided by primary care physicians - was a key strength of the health care system[2], largely relied on a medicalized approach to prevention, with an emphasis on routine medical check-ups (Tulchinsky & Varavikova, 1996).

The data at hand allow us to set up an event study analysis that will enable us to control for unobserved heterogeneity and to deal with different preventive care services. We look at blood pressure check-ups, dental care, gynaecological test, mammogram test, blood test, and vision tests. Additionally, we control for a rich set of need factors related to aspects of individuals' health status and for other socio-demographic variables that may affect the use of preventive care.

Our findings show a mixed picture across different types of preventive care. We do not find any difference in the use of vision tests and blood tests around the time of migration, while we document a significant increase in the utilization of dental care for both males and females in the years after migration with respect to the migration year. As regards women, the utilization of blood pressure check-ups, gynaecological visits, and mammograms increase almost linearly after migration.

The remainder of this paper is organized as follows. The next section describes the variables and the data used in the empirical analysis. Section 3 explains the estimation strategy, while in Section 4, we present the main results. Section 5 concludes.

[2] Preventive medicine was considered a crucial aspect of the *Semashko* system (Rechel et al., 2013; Richardson, 2013), which was adopted in most former communist countries in Europe.

1. Data and variables

We use data from the Survey on Health Ageing and Retirement in Europe (SHARE). SHARE started in 2004 in 11 European countries and focuses on the population aged 50 and over. It is a multidisciplinary, longitudinal survey, which runs every 2 years, and collects information on all the relevant aspects of the lives of the target population. The most recent wave (wave 8) ran in 2019-2020 and covered 28 countries (all the EU countries except for Ireland but including Israel).

The third and seventh waves of the SHARE survey that took place respectively in 2008/9 and 2017 collected retrospective interviews on a large sample of Europeans. The 2008/9 wave of SHARE provided life-history information for a representative sample of about 27,000 respondents aged 50 or over from 14 countries. The domains of interest include family relationships, fertility, housing, working history, health status and health care utilization over the life course. In wave 7, all respondents involved in SHARE that did not participate in wave 3 were administered the life history interview. Wave 7 took place in 2017 in 28 countries, reaching full coverage of the EU. Moreover, many countries included in wave 3 substantially enlarged their samples in waves 4 to 6. The result is that about 62,561 respondents took part in the retrospective interview of wave 7.

The original dataset contains sequences of life events in a flat-file format. For example, the country of residence is looped over all the residences respondents had in their life. The information is stored as a set of variables for each individual in the sample. We use the data reorganized in a retrospective panel dataset (the so-called "job episodes panel") described in Brugiavini et al. (2019): each respondent contributes as many observations as there are years of age from birth to the period at which they are observed at the moment of the interview. Information is reorganized in a longitudinal file format. Following the country of residence example, for each year of respondents' life, we know the country they were living in at *that* time. The Job Episodes Panel includes basic demographics and work-related characteristics. We merged information regarding the onset of chronic diseases from the regular waves of SHARE and information regarding health care use from the two retrospective waves.

The SHARE survey allows reconstructing the health care history of the respondents, providing information on several important medical tests/visits: dentist visits, blood pressure check-ups, blood tests, gynaecological test, mammograms and vision tests. Whilst for blood pressure check-up and dental care, SHARE collects the relevant information both in wave 3 and in wave 7; for the other types of preventive care, the data is only present in wave 3. Therefore, we end up with a different number of observations in the estimations we will present hereafter. For all the medical checks indicated above, the survey provides two types of information. On the one hand, we know when healthcare check-ups started and whether the respondents have received them regularly, for every 10-15 years' age band of their past life. On the other hand, for each period when regular visits occurred, the respondents report the frequency of the visits/tests: "at least once a year", "not every year but at least every two years", or "less often". Organizing this information along the lines of the Job Episodes Panel, we observe every respondent's participation in preventive healthcare checks for each year of life.

Our variable of interest is the migration status of respondents over their lifespan. To generate this variable, we combine information on the country of birth and the country of residence of respondents. First, we generate a dummy indicator that assumes value one if the respondent declares to live in a country that is different from his/her country of birth at time *t*, and zero otherwise. Since we are interested in studying trajectories in preventive care use before and after the migration event, we then introduce a set of lags and leads of the dummy previously created. Specifically, we analyse the differences in the utilization of regular medical visits in each of the 5 years before and after migration, with respect to the migration year. Longer than five years time-lapses are estimated by including two binary variables (one for the period before and one for the period after migration) taking value of 1 if year *t* is 6 years or more "far" from the migration moment, and 0 otherwise.

Among controls, we include a set of time-variant socioeconomic and health information, namely the marital status, occupational status and the number of children of respondents. Marital status was categorized into 'living with a spouse or a partner in the same household' and 'living as single', while occupational status is a dummy variable that assumes value one when the respondents are working and zero otherwise. Moreover, we control for a quadratic

in age and the country of destination of immigrants. Regarding health controls, we focus on a set of commonly used measures of chronic conditions, which have been documented in the medical literature to be of particular relevance (Banks et al., 2006; Yach et al., 2004), such as cancer, cardiovascular conditions (heart attack and stroke), diabetes and arthritis, plus the age at which the disease has been diagnosed for the first time. By combining this information, we first generate a set of binary variables assuming value one when the respondent had been diagnosed in a given year or in the past with one or more specific diseases and zero otherwise. Second, a principal component analysis (PCA) was used to build a composite health index using all the health indicators previously mentioned – results remained robust using a composite health index (results are available from the authors upon request).

In Table 1, we provide the main characteristics of the sample. Our sample includes 1,598,814 observations for 23,486 individuals, of which about 54.5% are women. All the respondents in our analysis have migrated at least once along their life course. However, some have experienced more than one migration episode. On average, the number of migration spells is about 1.5. About 29% were born in Western Europe, while the majority (45%) has emigrated from East European countries. Immigrants from Africa and Asia account for 2.5% and 2.4% of the sample, respectively. Finally, respondents born in any of the American countries (North or South) only represent 0.8% of the observations.

Individuals in our sample used the dentist check-ups in 66% of the cases and utilized blood pressure check-ups in about 19% of the cases. As for the blood tests, gynaecological visits, mammograms, and vision tests, the sample shrinks because the data for these tests were obtained only from wave 3 of the SHARE survey. Gynaecological visits and mammogram tests were used in about 41% and 14% of the cases, respectively.

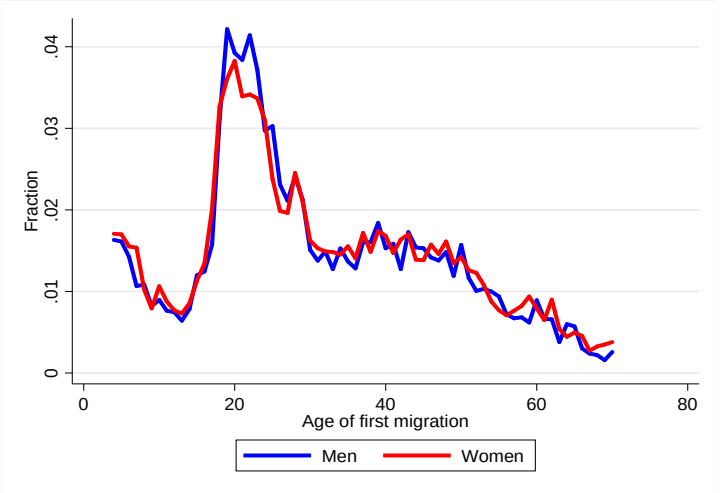
Table 1. Summary statistics

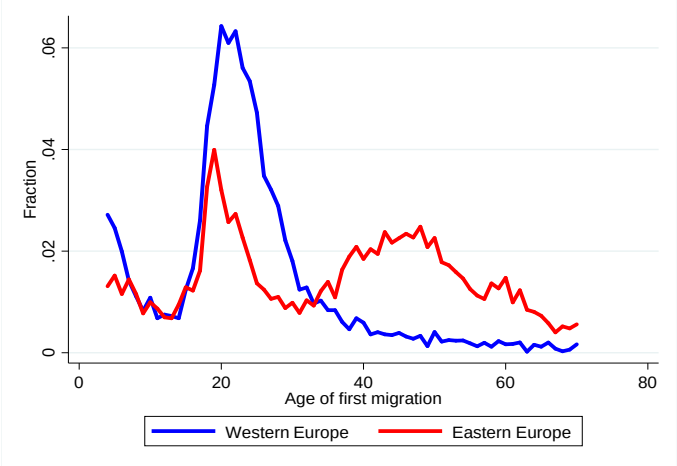
	Observations	Mean	Std.Dev.	Minimum	Maximum
Socio-demographic variables					
Gender (female)	1,598,814	0.545	0.498	0	1
Number of migration spell	1,598,814	1.560	0.978	1	14
Number of children	1,598,814	1.204	1.340	0	14

Marital status (married)	1,598,814	0.572	0.495	0	1
Preventive care					
Dental care	1,529,927	0.662	0.473	0	1
Blood pressure check-ups	1,492,504	0.192	0.394	0	1
Blood tests	479,449	0.175	0.380	0	1
Gynaecological test	259,645	0.411	0.492	0	1
Mammogram test	261,683	0.141	0.348	0	1
Vision tests	479,422	0.253	0.435	0	1
Region of origin					
Western Europe	1,596,472	0.297	0.457	0	1
Eastern Europe	1,596,472	0.453	0.498	0	1
Africa	1,596,472	0.025	0.157	0	1
America	1,596,472	0.008	0.090	0	1
Asia	1,596,472	0.024	0.153	0	1

In Fig 1, we describe the moment of migration along individuals' lifetimes. Fig. 1a displays, separately by gender, the distribution of the moment of the first migration by age. The figure shows that the patterns are relatively similar for men and women, with most migrations occurring at younger ages (i.e., 18-40 years). Fig. 1b presents the distribution of migration by age at first migration spell, separately for the two regions of origin: Western versus Eastern Europe. The figure points out important differences between the two regions. While migration of individuals born in Western Europe mainly occurred at younger ages (18 to 35), the graph displays two peaks for the individuals born in Eastern Europe: one (significantly smaller than for occidental countries) at younger ages (18 to 25) and the second between ages 35 to 55. Given the birth cohorts in the sample, this second peak could correspond to the period after the fall of the communist regimes in East European countries.

Figure 1. Distribution of migration moment across age at first migration spell

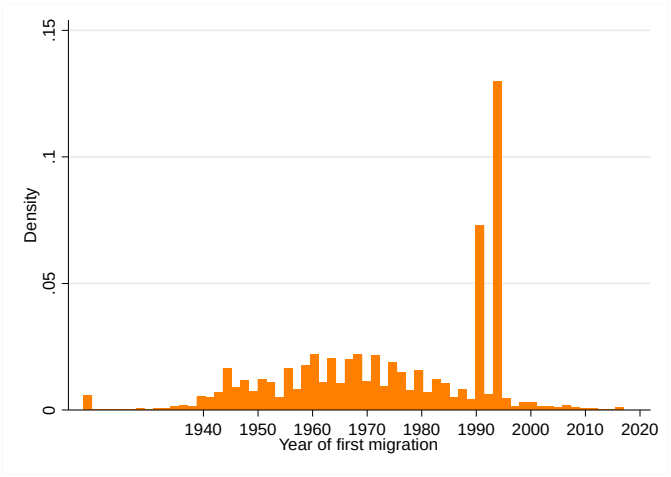




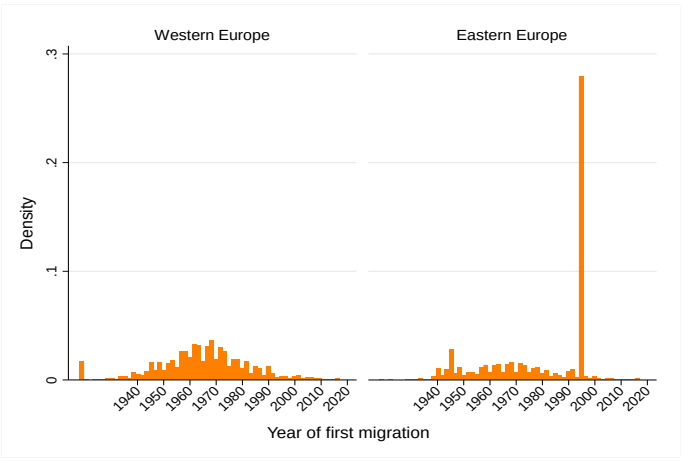
(a) Gender (b) Region of origin

In Fig. 2a, we show the distribution of the migration moment by year of first migration spell for the whole sample, whereas in Fig. 2b, we present it separately by region of origin (Western Europe vs Eastern Europe). Most migrations occurred between 1960-1970, but the large number of migrations between 1990-1995 is striking, and Fig. 2b confirms that these correspond to the fall of the communist regimes in Eastern European countries.

Figure 2. Distribution of migration by year of the first migration



(a) Pooled sample



(b) By region of origin

In the Appendix Figs. A1 and A2, we show preventive healthcare utilization for the years before and after migration. Year 0 indicates the year of migration. Except for dental care utilization, all the others show a slightly increasing trend throughout the years with a sharper increase after the 5th year after migration. However, at this stage, no conclusion may be derived given that such a trend could also depend on the effect of individuals ageing throughout, which we cannot disentangle from the descriptive analysis. We can, however, observe a little effect particularly for the gynaecological check-ups, which display a slight kink in the first year before migration.

2. Empirical strategy

Following (Cavapozzi et al., 2020; Myrskylä & Margolis, 2014), the empirical strategy is summarised by the following fixed-effects linear probability model specification:

$$H_{ict} = \alpha_0 + \beta_1 M_{ict+6} + \beta_2 M_{ict+5} + \beta_3 M_{ict+4} + \beta_4 M_{ict+3} + \beta_5 M_{ict+2} + \beta_6 M_{ict+1} + \beta_7 M_{ict-1} + \beta_8 M_{ict-2} + \beta_9 M_{ict-3} + \beta_{10} M_{ict-4} + \beta_{11} M_{ict-5} + \beta_{12} M_{ict-6} + \boldsymbol{X}_{it}\delta + t_t + c_c + \gamma_i + \varepsilon_{it}$$

The outcome variable of our specification, H_{ict}, is a binary indicator taking value 1 if respondent *i* in country *c* uses a preventive health *H* at time *t* in life and 0 otherwise. The explanatory variable $M_{ict\pm j}$ are dummies indicating lags and leads compared to the year of migration. M_{ict+j} takes value one in year *t* if individual *i* will migrate to country *c* exactly *j* years after year *t* (that is, in year *t+j*), and 0 otherwise. A value of one of the variable M_{ict-j} means instead that individual *i* living in country *c* migrated in country *c j* years before *t* (that is, in year *t-j*). We include 6 lags and 6 leads in the specification, where M_{ict+6} takes value one if individual *i* will migrate to country *c* 6 years or more after year *t*, and M_{ict-6} is defined similarly. The excluded dummy is M_{ict+0}, i.e., the dummy indicating that *t* is the year of migration; therefore, the coefficient of each $M_{ict\pm j}$ is interpreted as the difference in utilization of health care *H* in year *t* compared to the year of migration. $\boldsymbol{X}$ is a vector of individual time-varying socio-demographic and health characteristics while t_t are year fixed effects to control for time-varying heterogeneity at the macro-level expected to affect individuals' utilization of preventive care (e.g., changes in public spending/coverage in healthcare). Moreover, we include a set of the country of residence fixed effects (c_{it}) and a set of individual fixed effects γ_i to control for unobservable individual characteristics. ε_{it} is an idiosyncratic error term. Standard errors are clustered at the individual level.

3. Results

Table 2 reports the results of our baseline specification, separately by type of preventive care and gender. Figure 3 plots the marginal effects of the *M* dummies to facilitate their interpretation. Note that for mammogram tests, we restrict our sample to women aged 40 years and above.[3]

[3] The American Cancer Society says that women should have the choice to get an annual mammogram beginning at age 40 and recommends that all women at average risk should be screened annually beginning at age 45. The

As for blood pressure tests for men and vision tests for both men and women, coefficients are not statistically significant. In other words, we do not observe any effect of migration on the propensity to use these types of care. Blood pressure tests are easy and cheap checks that can be done even at home; therefore, it does not surprise us that we do not find any difference between utilization in origin and the destination country, at least for men. However, for women, we observe a statistically significant effect of migration on the propensity to use blood pressure tests before and after migration. This result could be explained partly by the fact that women are more likely to have their blood pressure measured (Rahman et al., 2017). Further, women are more likely to see health care providers for birth control and regular gynaecological services (Bertakis et al., 2000), increasing the likelihood that during such screenings, they will have their blood pressure checked (Schmittdiel et al., 2011). Regarding vision tests, our interpretation is that sight problems can occur at any age, and individuals in need of treatment or simply of corrective lenses resort to regular vision tests as soon as the problem arises.

We find that the probability of dental care utilization in the home country (i.e., in the five years before migration) is significantly lower than at the time of migration, while it is higher after reaching the new host country: migration clearly marks a discontinuity. The magnitude of the coefficients after migration is comparable but slightly increasing in the first years. Individuals use dental care significantly less in their origin country than in the host country. As soon as they migrate, they gradually increase dental care utilization. There are several possible explanations. On the one hand, depending on the migration modality, individuals may improve their economic situation (higher wages with respect to their origin country, for example, for migrant workers) after reaching the host country. This would allow them major access to dental care, that generally is not supported by public health insurance but imply out-of-pocket expenses. In addition, the gradual increase in the utilization of regular oral care may be related also to getting better knowledge on the healthcare system in the host country.

RSNA supports screenings starting at the age of 40. Therefore, following this recommendation, for mammograms, we run our analysis for females aged 40 and above (https://www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/american-cancer-society-recommendations-for-the-early-detection-of-breast-cancer.html)

Second, an important strand of medical literature document that oral health is subject to "accumulation" issues. That is, low levels of oral regular care in early age determine increased need later in life. These explanations are somehow supported by the fact that, when asked why they did not take regular dental care, a majority of respondents in the SHARE survey answered "not considered to be necessary" (60.5% of those that reported periods without regular oral care) and/or "not affordable" (11.5%). Another possible explanation is that migrants might consider dental care in the host country of better quality compared to the origin country. Finally yet importantly, individuals may have migrated from countries with less generous health insurance to countries with more comprehensive ones. This results complement the available literature (see Erdsiek et al., 2017), which indicated the existence of different barriers, mainly financial and cultural barriers, related to dental care utilization among immigrants compared to natives.

Blood tests follow a similar pattern: the difference in utilization before migration is significant and negative; it turns positive in the second and third years after migration. Later (years 4, 5, 6 or more), there are no statically significant differences with respect to the year of migration, but utilization remains higher than in the origin country. The lower use of this type of check-ups in the origin country might be related to the fact that migrants are generally in better health. Regarding the increase in blood tests utilization after migration a possible explanation may be again that the quality of blood tests might be higher in the host rather than in the origin country or it may be related to the difference in the health insurance coverage between the home and the host countries.

Gynaecological tests and mammograms display different patterns with respect to the previous check-ups. In the years before the migration event, the probability of performing gynaecological examinations is positive and statistically significant, but the magnitude of the effects decreases as we get closer to the year of migration. For the mammogram test, the coefficients associated with the pre-migration years are positive but statistically insignificant for most episodes (4, 3, 2, and 1 year before migration), and their magnitudes tend to be lower as we approach the migration moment. This trend is reversed after the migration event, when the utilization of both gynaecological and mammogram tests increases significantly compared to the year of migration. Note that for the gynaecological visits the coefficients associated to the post-migration period become positive and significant already in the first year after reaching the host country and the magnitude of the effects is comparable throughout all the

first five years after migration. Since this type of check-up is closely related also to childbearing, such a particular trend (both in pre and post-migration years) may be related to how migrant women "programme" their pregnancies. As for mammograms, the significant and gradual increase in their utilization starting with the second year after migration may be because these tests require a certain degree of integration into the new country. An important difference with respect to the other types of care considered is that gynaecological tests, and even more so mammograms, are used mainly for preventive purposes; therefore, it may well be that migrant women postpone their regular use a bit at migration to settle down.

Tables 3 and 4 report the coefficient estimates for the different types of preventive care, when running our empirical specification separately by region of origin. We distinguish between two main regions: (1) Western and (2) Eastern Europe. The former includes individuals born in: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom, who experienced at least one spell of migration. The latter considers individuals born in East European countries namely, Albania, Azerbaijan, Bulgaria, Belarus, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, etc..

Individuals from Western countries use dental care significantly less in the year of migration compared to the spells before and after this event. In other words, the year of migration, possibly because of the turmoil associated with moving to another country, marks an interruption in an otherwise regular use of dental care. East European migrants drive the results we observed in the pooled sample: they use significantly less dental care in the years preceding migration (with respect to the year of migration), while their use of regular dental check-ups increases after reaching the host country, particularly after the fourth year of the migration episode. The magnitude of these effects is larger than what we observe in the pooled sample, where the effect is average between Western and Eastern Europeans. We can identify several plausible explanations for this increasing trend. First, it may be driven by an improvement in the economic conditions of the immigrants after reaching the host country, together with progressively getting to know better the particularities of the healthcare coverage and the language of the new country. Dental care is typically paid out of pocket by patients and is mainly oriented towards pain relief rather than primary prevention, which

tends to be cost-intense (Jatrana et al., 2009). An improvement in the economic conditions of immigrants, once they get settled in the host country, may increase the likelihood of using regular dental check-ups.

Another possible explanation, as we proposed for the pooled sample, may be related to an accumulation issue: low levels of oral healthcare in early age lead to increased need later in life. Indeed, while the coefficients in the first years after migration are positive but not significant, they become significant starting with the fifth year and display a sharp increase after six years or more.

The observed trend for the migrants coming from East Europe may also concern the quality of the dental care service, which might be lower in some East European countries (such as ex-Soviet countries). Dentist density could also explain part of the observed differences in the utilization of dental care. Jakovljevic et al. (2016) indicated significant regional differences within the European continent. The list is topped by mostly Mediterranean countries (Portugal, Cyprus, Spain, Greece) and high-income economies (Luxemburg and Austria). East European countries such as Macedonia, Estonia, Bulgaria, Belarus, Croatia, Latvia, Romania, Lithuania, Hungary, Czech Republic, Ukraine, Armenia, Republic of Moldova, Kazakhstan experienced substantial staff density increase due to their transitional health reforms. However, dentist density is still lower than in Western Europe, and the rise in the number of dentists does not necessarily reflect an increased output. For example, Tchicaya & Lorentz (2014) indicated the presence of heterogeneity in the probability of the non-use of needed dental care at the country level and showed that most East European countries had a higher risk of non-use.

As for blood pressure tests, the results display some differences between East and West. Immigrants from Western Europe use fewer blood pressure check-ups before migration – compared with the year in which migration occurred –while they slightly increase the use of such services after three years of migration. Still, the effects are not significant. Individuals emigrating from East Europe instead, are associated significantly larger likelihoods of using blood-pressure check-ups in the pre-migration years. The migration moment marks a discontinuity. The utilization of this type of check-up is progressively increasing after the second year of migration, trend which could be partly explained by a learning/assimilation effect towards the healthcare system of the host country.

While we can observe some differences in their trajectories between the two origin regions, the use of blood tests and vision tests do not display important significant effects around the time of migration neither for West nor for East European migrants. The associated coefficients are statistically insignificant before and after the migration event for all the years, for the immigrants from Eastern Europe. As explained above, the utilization of vision tests is mainly driven by need. Sight problems can occur at any age, and individuals in need of treatment do resort to regular vision tests as soon as the problem arises, independently where they are. We interpret in a similar way also our results with respect to blood tests, that is, their utilization is strongly related to need factors. The need for blood tests may occur as soon as a particular health problem arises. Indeed, the respondents in our sample indicated as the main motivation for not having taken regular blood tests: "not considered to be necessary" (84.7%) while only about 7% answered "not used to get it" and much lower percentages provided other reasons.

Focusing on the women specific screening tests, our results point out important differences in the trajectories of the utilization of both gynaecological tests and mammograms between immigrants from Western and from Eastern Europe. Females from Western Europe display lower but not significant probabilities of using gynaecological check-ups in the pre-migration years with respect to the migration moment. Differently, the coefficients associated with the years after migration are gradually increasing and statistically significant, denoting a positive association between the length of the period following migration and the likelihood of using gynaecological examinations. This may highlight a slow but persistent integration of Western female immigrants in the health care system of the host country but may also be related to choices in the childbearing moment.

On the contrary, we find a higher likelihood of using gynaecological tests for women emigrated from East European countries in the pre-migration periods while the coefficients become statistically insignificant in the first five post-migration years and significant but negative after a time-lapse of more than six years after migration (Table 4, columns 3). Such contrasting patterns in the trajectories of gynaecological check-ups utilization between Western and Eastern immigrants may point to an issue of selection in the two sub-samples. Indeed, as descriptive figure 1 above shows, West Europeans mainly migrated at young ages (18-35) while individuals born in East Europe migrated either very young (18-25) or at later ages (38-58). This is especially relevant for women, who experience some critical periods along

their life, related to the "biological clock" and reproductive time and closely related to specific types of medical check-ups.

A selection issue may also partly explain the particular and strongly different patterns in the utilization of mammograms around the migration moment between West and East European migrant women. Females born in West Europe do not exhibit any significant change in the probability of using mammograms relative to the migration moment, neither for the five years before nor for the years after migration. This may be due to the fact that most migrations from West Europe occur at ages well below 40 and the mammograms specification is run only on a sub-sample of females above the age 40, so we do not have many individuals in their pre-migration or early post-migration years.

To test the validity of our results, we perform a set of robustness checks. First, we replicate the analysis by adding a set of year dummies associated with the second migration spell for those individuals who experienced more than one migration spell. Results related to the second spell of migration show a mixed picture and low precision, while those relative to the first migration spell are in line with the results presented above. Second, rather than having binary 0/1 outcome variables, we discretize the outcome variables encompassing, for each period when regular visits occurred, the frequency of visits taking four values, corresponding to the following situations: "at least once a year", "not every year but at least every two years", "less often", "no regular check-ups",. Estimating an ordinary least squares model using these discrete outcome variables, we find a fairly consistent result, suggesting that results are robust to changes in variables coding.

5. Conclusions

Providing robust evidence around migrants use of preventive health care services is important to inform health policy, allow health authorities to plan for the needs of their migrant population properly, and ensure that the public discourse on migration is appropriately informed. When the health services are under pressure, it becomes essential to understand what the evidence tells us about how migrants use preventive health care services.

In this study, we use data from the third and seventh waves of the survey of health, ageing, and retirement in Europe (SHARE), which collected retrospective information on a large sample of Europeans. The survey allowed us to reconstruct the health care history of the respondents with information on several crucial preventive care: dental care, blood pressure, blood tests, gynaecological visits, mammograms and vision tests. Our analysis indicates an increase in the use of preventive health care utilization in the years following the migration event with respect to the year of migration for four out of six preventive health care services (dental care, blood pressure check-up, gynaecological tests, and mammograms). When we examined blood tests and vision tests, we found no significant effects in the years following the migration event, with respect to the year in which migration occured.

We then focus on a heterogeneity analysis by region of origin (Eastern vs Western European countries) and estimate the probability of utilizing preventive care before and after migration. We find an increase in the likelihood of dental care use and gynaecological visits among individuals migrating from Western European countries for most post-migration episodes. However, for the other preventive health care services (blood pressure, mammogram test, blood test, and vision test), the probability of utilization becomes statistically insignificant for most of the post-migration events. Looking at the variation in the utilization of preventive care among individuals from East European countries before and after migration, we showed that whilst the probability of usage of dental care and blood pressure tended to increase in the post-migration years, the remaining preventive care services become statistically insignificant after migration.

Our results suggest that, as migrants get accustomed to the host country's healthcare system, the probability of using regular healthcare check-ups tends to increase with respect to the migration moment. This has important policy implications for the healthcare system of the host countries in terms of planning for the health needs of migrants in the future: regular use of preventive care reduces the number of acute (and costly) cases to be treated and improves overall health conditions of utilizers. Further work is still needed to examine whether recent negative media representations of migrants, uncertainty about eligibility for the healthcare services of the host nations – or even concerns over immigration enforcement - may be barriers to some vulnerable migrant populations in the destination countries in accessing preventive

health care. Still, the fact that migrants increase their use of preventive care as they arrive in the host country is good news.

Our analysis is subject to several limitations that derive from the lack of some information in our data. First, while SHARELIFE performs particularly well in allowing us to reconstruct the entire healthcare and accommodation history of the respondents, it does not allow us to observe and control, for the family income/wealth history throughout life. Similarly, we can observe the variations in the marital status of the individuals along time but we only know details on the socio-economic status (education, occupation) of the spouses starting with the regular waves. So, if a respondent went through several marriages along life, we cannot link these informations for each spouse. Such factors are identified by the existing literature as important enabling (income, wealth) or predisposing (education, occupation, ethnicity) factors that determine the individuals behaviours in relation to the use of various types of healthcare. The lack of such information impedes us to clearly disentangle between the effect due to the improvement in the economic situation and that attributable to getting acquainted to the host country language and healthcare system when evaluating the utilization of regular healthcare after migration.

Table 2. Baseline results: the probability of utilization of preventive care in life – before and after migration. Fixed-effects linear probability models estimated in the sample of migrants – migration spell one

	(1) DC Women	(2) DC Men	(3) BP Women	(4) BP Men	(5) GT Women	(6) MT Age>=40	(7) BT Women	(8) BT Men	(9) VT Women	(10) VT Men
> = 6 years or before	0.0004	-0.0108**	0.0040	0.0000	0.0696***	0.1162***	-0.0078	-0.0089	-0.0051	0.0029
	(0.0050)	(0.0054)	(0.0052)	(0.0051)	(0.0113)	(0.0248)	(0.0083)	(0.0089)	(0.0092)	(0.0099)
5 years before	-0.0102**	-0.0188***	0.0070*	0.0025	0.0458***	0.0393*	-0.0136**	-0.0164**	0.0058	0.0056
	(0.0041)	(0.0042)	(0.0042)	(0.0040)	(0.0093)	(0.0231)	(0.0068)	(0.0072)	(0.0075)	(0.0079)
4 years before	-0.0099**	-0.0155***	0.0092**	0.0041	0.0375***	0.0167	-0.0102	-0.0166**	0.0083	0.0119
	(0.0040)	(0.0041)	(0.0042)	(0.0040)	(0.0090)	(0.0225)	(0.0068)	(0.0071)	(0.0072)	(0.0078)
3 years before	-0.0092**	-0.0145***	0.0091**	0.0044	0.0332***	0.0041	-0.0115*	-0.0174**	0.0072	0.0115
	(0.0039)	(0.0039)	(0.0041)	(0.0039)	(0.0086)	(0.0226)	(0.0067)	(0.0069)	(0.0070)	(0.0076)
2 years before	-0.0092**	-0.0131***	0.0102**	0.0052	0.0291***	0.0044	-0.0118*	-0.0156**	0.0045	0.0109
	(0.0038)	(0.0038)	(0.0040)	(0.0038)	(0.0083)	(0.0223)	(0.0066)	(0.0068)	(0.0068)	(0.0073)
1 year before	-0.0086**	-0.0107***	0.0086**	0.0058	0.0224***	-0.0074	-0.0145**	-0.0181***	0.0012	0.0072
	(0.0037)	(0.0037)	(0.0040)	(0.0038)	(0.0080)	(0.0219)	(0.0065)	(0.0067)	(0.0065)	(0.0072)
1 year after	0.0016	0.0035***	0.0029**	-0.0008	0.0144***	0.0044	0.0024	0.0008	-0.0038*	0.0032
	(0.0010)	(0.0011)	(0.0012)	(0.0011)	(0.0033)	(0.0059)	(0.0023)	(0.0023)	(0.0023)	(0.0024)
2 years after	0.0040***	0.0052***	0.0045***	0.0001	0.0135***	0.0166**	0.0056*	0.0055*	-0.0041	0.0036
	(0.0014)	(0.0016)	(0.0016)	(0.0016)	(0.0043)	(0.0078)	(0.0030)	(0.0033)	(0.0030)	(0.0033)
3 years after	0.0051***	0.0066***	0.0069***	0.0007	0.0161***	0.0264***	0.0086**	0.0040	-0.0039	0.0053
	(0.0017)	(0.0020)	(0.0019)	(0.0020)	(0.0050)	(0.0091)	(0.0036)	(0.0038)	(0.0036)	(0.0040)
4 years after	0.0033*	0.0054**	0.0100***	0.0042*	0.0154***	0.0322***	0.0040	-0.0022	-0.0006	0.0059
	(0.0019)	(0.0023)	(0.0023)	(0.0023)	(0.0056)	(0.0103)	(0.0042)	(0.0044)	(0.0043)	(0.0047)
5 years after	0.0045**	0.0069***	0.0091***	0.0062**	0.0181***	0.0373***	-0.0011	-0.0069	-0.0016	0.0052
	(0.0021)	(0.0025)	(0.0025)	(0.0026)	(0.0063)	(0.0112)	(0.0046)	(0.0049)	(0.0048)	(0.0052)

> = 6 years after	0.0161***	0.0229***	0.0070*	0.0024	-0.0110	0.0630***	0.0099	-0.0045	-0.0025	0.0009
	(0.0032)	(0.0037)	(0.0039)	(0.0042)	(0.0084)	(0.0130)	(0.0066)	(0.0071)	(0.0070)	(0.0076)
Age	0.0059***	0.0005	0.0015	-0.0021**	0.0176***	0.0618***	0.0086***	0.0097***	0.0096***	0.0077**
	(0.0010)	(0.0011)	(0.0015)	(0.0008)	(0.0015)	(0.0055)	(0.0009)	(0.0011)	(0.0030)	(0.0035)
Age squared	-0.0000***	0.0000***	0.0001***	0.0001***	-0.0002***	-0.0004***	0.0000***	0.0000**	-0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Number of children	0.0000	-0.0012	-0.0067***	-0.0023	0.0189***	0.0094	-0.0038	-0.0040	-0.0148***	-0.0061
	(0.0018)	(0.0020)	(0.0019)	(0.0021)	(0.0041)	(0.0222)	(0.0031)	(0.0033)	(0.0034)	(0.0037)
Emp't status (working)	-0.0099***	0.0019	-0.0196***	-0.0236***	0.0614***	0.0028	-0.0128***	-0.0316***	-0.0155***	-0.0040
	(0.0022)	(0.0029)	(0.0029)	(0.0037)	(0.0055)	(0.0079)	(0.0048)	(0.0066)	(0.0049)	(0.0064)
Marital status (married)	0.0125***	0.0176***	0.0182***	0.0206***	0.1911***	-0.0210	0.0055	0.0145**	-0.0195***	0.0091
	(0.0031)	(0.0037)	(0.0036)	(0.0039)	(0.0083)	(0.0199)	(0.0061)	(0.0067)	(0.0065)	(0.0073)
Observations	697,455	580,699	674,345	571,785	215,700	86,990	217,865	179,197	218,237	178,727
Number of individuals	12,321	10,109	11,928	9,953	3,852	3,846	3,894	3,150	3,899	3,143
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country of residence fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Health controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

*DC – dental care; BP – blood pressure check-ups; GT – gynaecological test; MT – mammogram test; BT – blood test; VT – vision test. *, **, *** indicate significance at 10%, 5%, and 1%, respectively. Standard errors in parentheses. Standard errors are clustered at the individual level.*

Fig. 3. Utilization of preventive care before and after migration, by gender. Note: 95% confidence intervals are reported

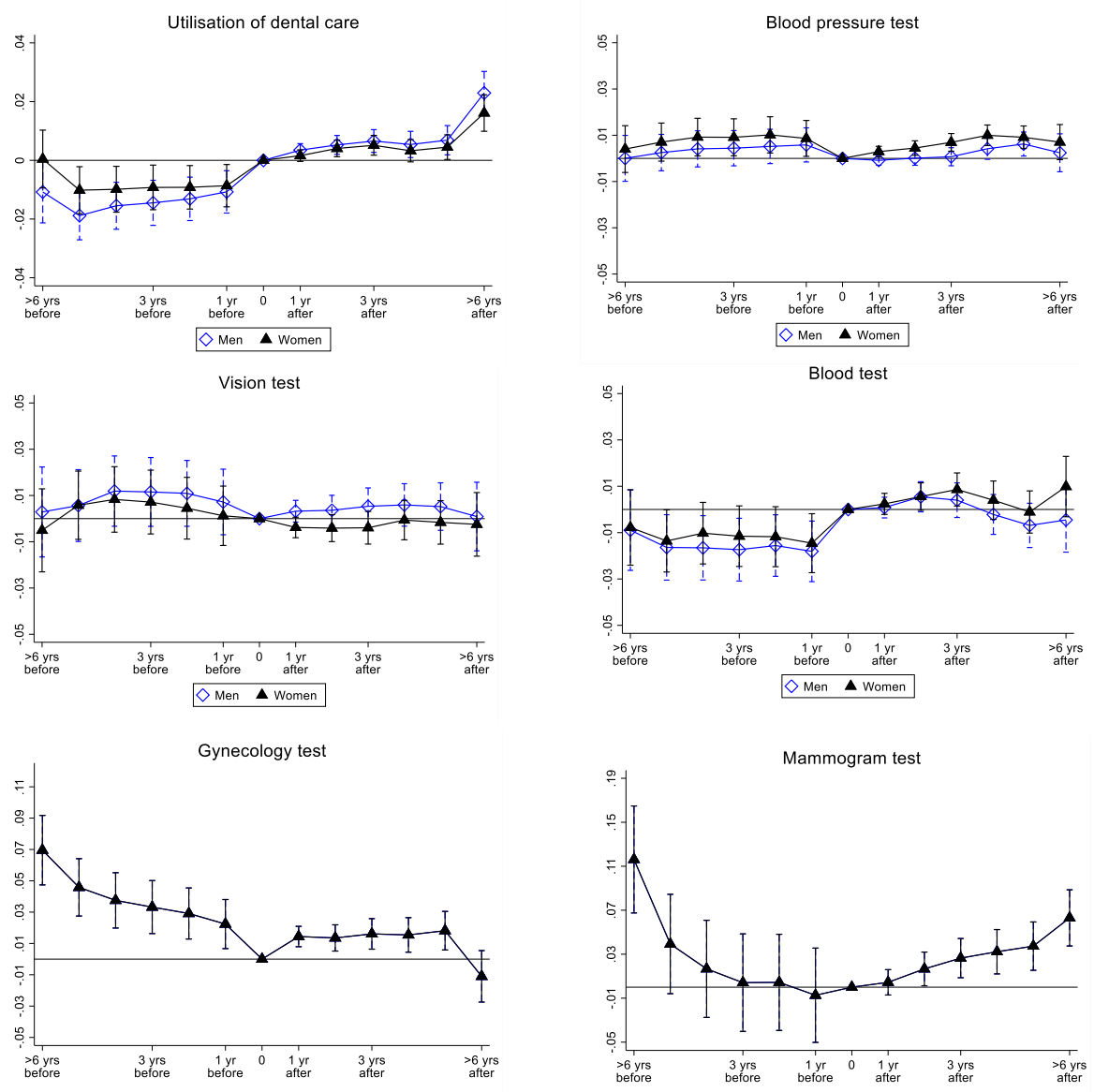


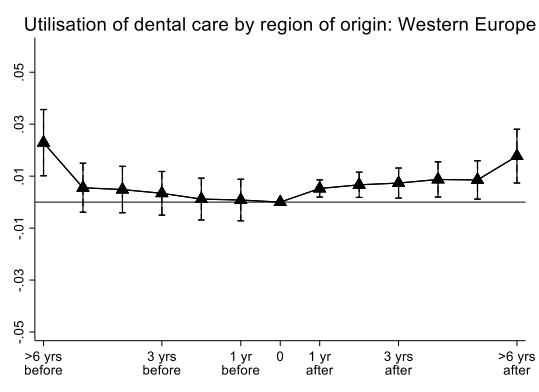
Table 3. Heterogeneity analysis (region of origin) Western Europe: the probability of utilization of preventive care in life: before and after migration. Fixed-effects linear probability models estimated in the sample of migrants

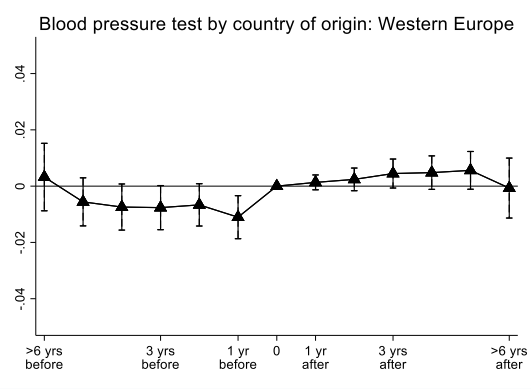
	(1)	(2)	(3)	(4)	(5)	(6)
	DC	BP	GT	MT	BT	VT
	WE	WE	WE	WE	WE	WE
> = 6 years before	0.0229***	0.0032	0.0198	0.1344**	0.0074	0.0171*
	(0.0065)	(0.0061)	(0.0192)	(0.0563)	(0.0090)	(0.0100)
5 years before	0.0055	-0.0056	-0.0147	0.0666	-0.0093	0.0048
	(0.0048)	(0.0044)	(0.0148)	(0.0574)	(0.0065)	(0.0073)
4 years before	0.0048	-0.0074*	-0.0156	0.0501	-0.0105*	0.0029
	(0.0046)	(0.0042)	(0.0142)	(0.0528)	(0.0062)	(0.0068)
3 years before	0.0034	-0.0076*	-0.0190	0.0398	-0.0122**	-0.0005
	(0.0043)	(0.0040)	(0.0135)	(0.0532)	(0.0059)	(0.0064)
2 years before	0.0012	-0.0067*	-0.0176	0.0437	-0.0144**	-0.0051
	(0.0041)	(0.0038)	(0.0128)	(0.0406)	(0.0058)	(0.0060)
1 year before	0.0008	-0.0110***	-0.0200*	0.0271	-0.0167***	-0.0141**
	(0.0041)	(0.0039)	(0.0120)	(0.0356)	(0.0057)	(0.0058)
1 year after	0.0052***	0.0013	0.0211***	-0.0167	0.0040	-0.0053**
	(0.0017)	(0.0013)	(0.0065)	(0.0146)	(0.0024)	(0.0025)
2 years after	0.0067***	0.0024	0.0233***	0.0141	0.0055	-0.0055
	(0.0025)	(0.0021)	(0.0084)	(0.0341)	(0.0035)	(0.0037)
3 years after	0.0073**	0.0045*	0.0337***	-0.0009	0.0066	-0.0054
	(0.0030)	(0.0026)	(0.0099)	(0.0427)	(0.0042)	(0.0045)
4 years after	0.0087**	0.0048	0.0355***	0.0044	0.0042	-0.0046
	(0.0035)	(0.0030)	(0.0111)	(0.0449)	(0.0048)	(0.0053)
5 years after	0.0085**	0.0056	0.0431***	0.0138	0.0005	-0.0049
	(0.0038)	(0.0034)	(0.0123)	(0.0473)	(0.0052)	(0.0058)
> = 6 years after	0.0177***	-0.0007	0.0287*	-0.0011	0.0014	-0.0186**
	(0.0053)	(0.0054)	(0.0159)	(0.0502)	(0.0079)	(0.0088)
Age	0.0056***	0.0001	0.0160***	0.0595***	0.0107***	0.0112***
	(0.0009)	(0.0013)	(0.0018)	(0.0062)	(0.0011)	(0.0024)
Age squared	-0.0000***	0.0001***	-0.0002***	-0.0004***	0.0000*	-0.0000*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Number of children	-0.0009	-0.0076***	0.0174***	0.0170	-0.0043	-0.0085**
	(0.0024)	(0.0025)	(0.0062)	(0.0346)	(0.0035)	(0.0039)
Emp't status (working)	-0.0013	-0.0163***	0.0341***	0.0081	-0.0190***	-0.0064
	(0.0033)	(0.0041)	(0.0089)	(0.0130)	(0.0062)	(0.0060)
Marital status (married)	0.0231***	0.0172***	0.1186***	0.0043	0.0104	-0.0154**
	(0.0044)	(0.0049)	(0.0132)	(0.0298)	(0.0073)	(0.0078)
Observations	375,591	365,642	84,110	35,087	158,086	158,357
Number of individuals	6,638	6,466	1,468	1,445	2,749	2,757
Year fixed effects	YES	YES	YES	YES	YES	YES

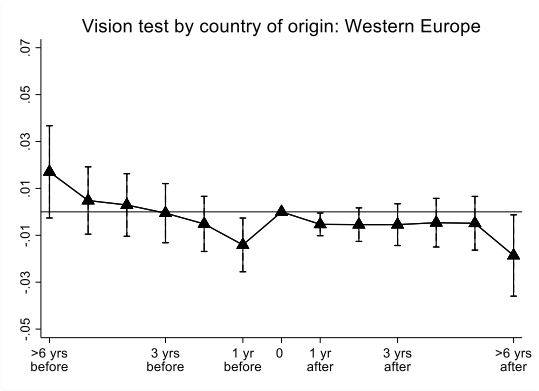
Country of residence fixed effects	YES	YES	YES	YES	YES	YES
Health controls	YES	YES	YES	YES	YES	YES

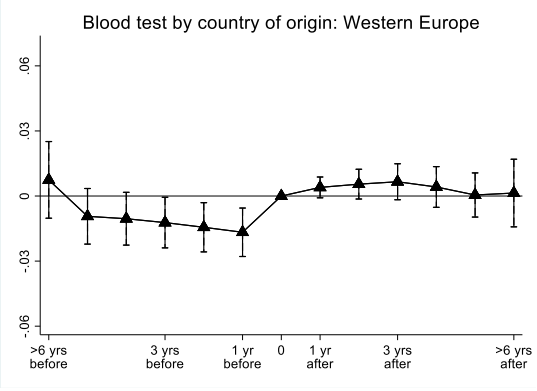
*DC – dental care; BP – blood pressure check-ups; GT – gynaecological test; MT – mammogram test; BT – blood test; VT – vision test; WE – Western Europe. *, **, *** indicate significance at 10%, 5%, and 1%, respectively. Standard errors in parentheses. Standard errors are clustered at the individual level.*

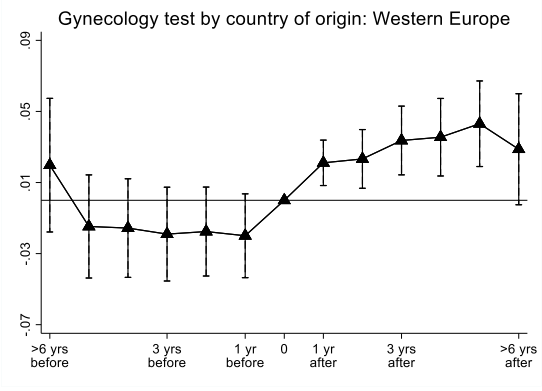
Fig 4. Utilization of preventive care before and after migration, by region of origin (Western Europe). Note: 95% confidence intervals are reported











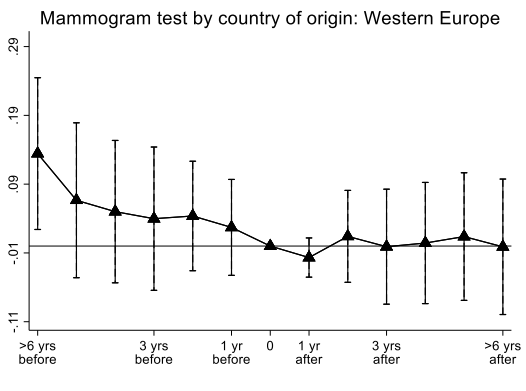


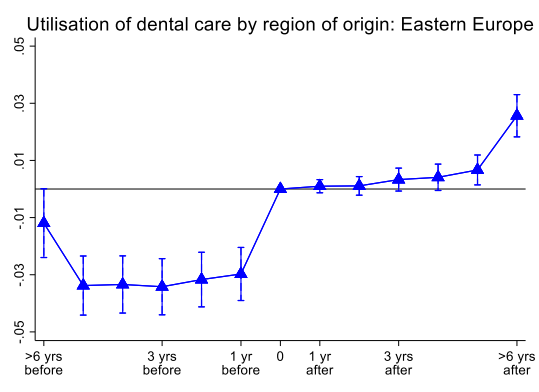
Table 4. Heterogeneity analysis (region of origin – Eastern Europe): the probability of utilization of preventive care in life - before and after migration. Fixed-effects linear probability models estimated in the sample of migrants

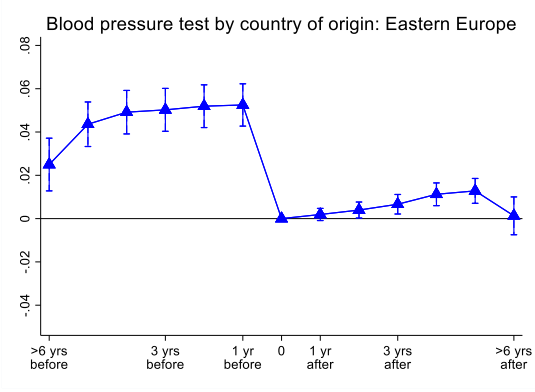
	(1)	(2)	(3)	(4)	(5)	(6)
	DC	BP	GT	MT	BT	VT
	EE	EE	EE	EE	EE	EE
> = 6 years before	-0.0119*	0.0250***	0.0812*	0.1381***	-0.0421	-0.0249
	(0.0061)	(0.0062)	(0.0421)	(0.0494)	(0.0288)	(0.0336)
5 years before	-0.0338***	0.0436***	0.0780*	0.0936*	-0.0302	-0.0035
	(0.0053)	(0.0052)	(0.0401)	(0.0500)	(0.0262)	(0.0309)
4 years before	-0.0334***	0.0492***	0.0843**	0.1021**	-0.0248	0.0160
	(0.0051)	(0.0051)	(0.0396)	(0.0493)	(0.0260)	(0.0306)
3 years before	-0.0342***	0.0502***	0.0813**	0.0928*	-0.0225	0.0176
	(0.0050)	(0.0051)	(0.0392)	(0.0496)	(0.0259)	(0.0303)
2 years before	-0.0317***	0.0519***	0.0724*	0.0974**	-0.0171	0.0131
	(0.0049)	(0.0050)	(0.0388)	(0.0495)	(0.0259)	(0.0300)
1 year before	-0.0297***	0.0525***	0.0756**	0.1000**	-0.0195	0.0091
	(0.0047)	(0.0050)	(0.0383)	(0.0478)	(0.0261)	(0.0300)
1 year after	0.0010	0.0019	0.0011	-0.0011	0.0003	0.0003
	(0.0012)	(0.0014)	(0.0056)	(0.0121)	(0.0052)	(0.0063)
2 years after	0.0011	0.0040**	0.0016	0.0093	0.0012	0.0012
	(0.0017)	(0.0019)	(0.0094)	(0.0147)	(0.0068)	(0.0075)
3 years after	0.0033	0.0066***	-0.0032	0.0188	-0.0006	0.0053
	(0.0020)	(0.0023)	(0.0111)	(0.0173)	(0.0078)	(0.0087)
4 years after	0.0041*	0.0112***	-0.0116	0.0164	-0.0098	0.0138
	(0.0024)	(0.0027)	(0.0135)	(0.0218)	(0.0094)	(0.0101)
5 years after	0.0067**	0.0128***	-0.0163	0.0152	-0.0172	0.0135
	(0.0027)	(0.0029)	(0.0151)	(0.0233)	(0.0105)	(0.0106)
> = 6 years after	0.0256***	0.0013	-0.0700***	0.0556**	-0.0208	-0.0020
	(0.0038)	(0.0045)	(0.0222)	(0.0264)	(0.0135)	(0.0144)
Age	0.0018	0.0020***	0.0270***	0.0612***	-0.0003	-0.0033**
	(0.0016)	(0.0007)	(0.0026)	(0.0047)	(0.0012)	(0.0013)
Age squared	0.0000***	0.0001***	-0.0002***	-0.0005***	0.0000*	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Number of children	-0.0031	-0.0016	0.0320***	-0.0054	-0.0003	-0.0172***
	(0.0021)	(0.0022)	(0.0080)	(0.0513)	(0.0045)	(0.0050)
Emp't status (working)	-0.0040	-0.0326***	0.0823***	-0.0191	-0.0318***	-0.0090
	(0.0025)	(0.0035)	(0.0101)	(0.0119)	(0.0074)	(0.0073)
Marital status (married)	0.0073**	0.0231***	0.2316***	-0.0660	0.0050	-0.0059
	(0.0034)	(0.0040)	(0.0149)	(0.0417)	(0.0087)	(0.0092)
Observations	581,673	560,869	69,504	28,238	121,440	119,876
Number of individuals	9,987	9,643	1,234	1,248	2,151	2,119

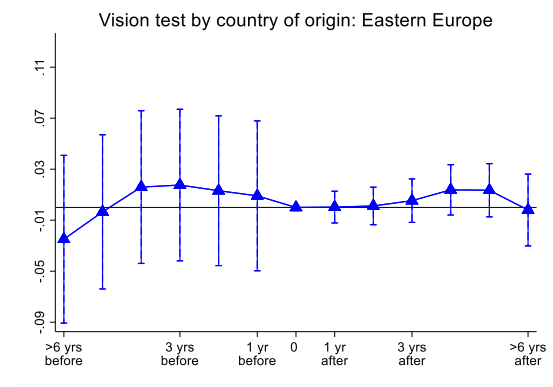
Year fixed effects	YES	YES	YES	YES	YES	YES
Country of residence fixed effects	YES	YES	YES	YES	YES	YES
Health controls	YES	YES	YES	YES	YES	YES

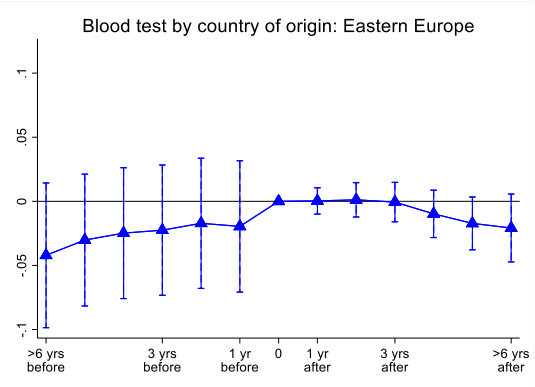
*DC – dental care; BP – blood pressure check-ups; GT – gynaecological test; MT – mammogram test; BT – blood test; VT – vision test; EE – Eastern Europe. *, **, *** indicate significance at 10%, 5%, and 1%, respectively. Standard errors in parentheses. Standard errors are clustered at the individual level.*

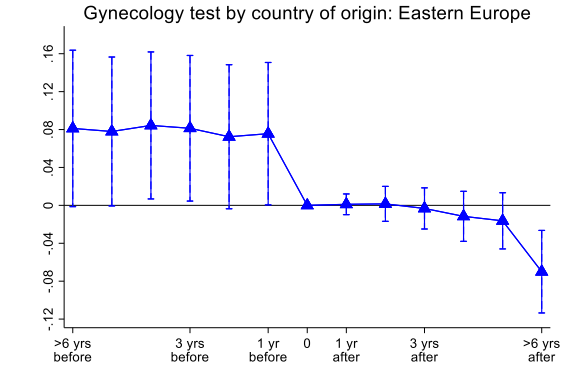
Fig 5. Utilization of preventive care before and after migration, by region of origin (Eastern Europe). Note: 95% confidence intervals are reported











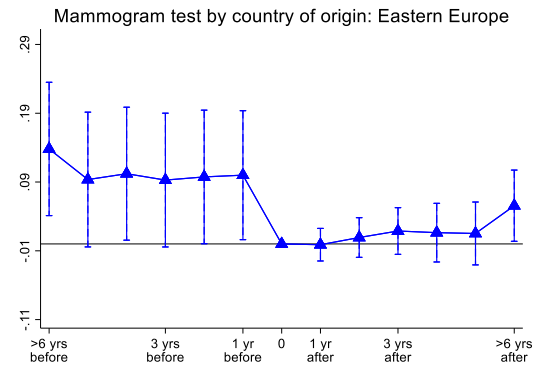


Table 5. Accounting two migration spells: the probability of utilization of preventive care in life: before and after migration. Fixed-effects linear probability models estimated in the sample of migrants

	(1) DC Women	(2) DC Men	(3) BP Women	(4) BP Men	(5) GT Women	(6) MT Age>=40	(7) BT Women	(8) BT Men	(9) VT Women	(10) VT Men
> = 6 years before (spell 1)	0.0000	-0.0100*	0.0052	0.0007	0.0720***	0.1337***	-0.0059	-0.0093	-0.0041	0.0027
	(0.0051)	(0.0055)	(0.0053)	(0.0053)	(0.0115)	(0.0271)	(0.0088)	(0.0093)	(0.0097)	(0.0104)
5 years before (spell 1)	-0.0097**	-0.0158***	0.0101**	0.0054	0.0470***	0.0527**	-0.0109	-0.0146*	0.0052	0.0058
	(0.0043)	(0.0045)	(0.0045)	(0.0045)	(0.0097)	(0.0256)	(0.0075)	(0.0079)	(0.0083)	(0.0087)
4 years before (spell 1)	-0.0097**	-0.0127***	0.0118***	0.0070	0.0378***	0.0374	-0.0082	-0.0149**	0.0072	0.0118
	(0.0042)	(0.0043)	(0.0044)	(0.0043)	(0.0092)	(0.0250)	(0.0073)	(0.0076)	(0.0078)	(0.0084)
3 years before (spell 1)	-0.0089**	-0.0120***	0.0114***	0.0074*	0.0336***	0.0232	-0.0098	-0.0157**	0.0057	0.0112
	(0.0040)	(0.0041)	(0.0043)	(0.0042)	(0.0088)	(0.0250)	(0.0071)	(0.0073)	(0.0076)	(0.0081)
2 years before (spell 1)	-0.0087**	-0.0108***	0.0122***	0.0078*	0.0291***	0.0224	-0.0105	-0.0138*	0.0027	0.0107
	(0.0039)	(0.0039)	(0.0042)	(0.0040)	(0.0084)	(0.0246)	(0.0070)	(0.0071)	(0.0072)	(0.0076)
1 year before (spell 1)	-0.0079**	-0.0085**	0.0106***	0.0081**	0.0215***	0.0090	-0.0137**	-0.0157**	-0.0009	0.0073
	(0.0038)	(0.0038)	(0.0041)	(0.0039)	(0.0081)	(0.0242)	(0.0068)	(0.0069)	(0.0069)	(0.0075)
> = 6 years before (spell 2)	0.0024	-0.0089	-0.0143**	-0.0155**	-0.0075	0.0091	-0.0070	-0.0134	0.0027	0.0014
	(0.0056)	(0.0061)	(0.0060)	(0.0062)	(0.0120)	(0.0251)	(0.0099)	(0.0105)	(0.0109)	(0.0113)
5 years before (spell 2)	0.0058	-0.0038	-0.0077*	-0.0140***	-0.0005	0.0110	-0.0018	-0.0096	0.0077	0.0038
	(0.0041)	(0.0044)	(0.0041)	(0.0044)	(0.0095)	(0.0225)	(0.0073)	(0.0079)	(0.0078)	(0.0079)
4 years before (spell 2)	0.0023	-0.0019	-0.0048	-0.0134***	-0.0035	0.0087	0.0010	-0.0119	0.0068	0.0030
	(0.0039)	(0.0041)	(0.0039)	(0.0041)	(0.0090)	(0.0220)	(0.0069)	(0.0076)	(0.0072)	(0.0075)
3 years before (spell 2)	0.0023	-0.0020	-0.0050	-0.0067*	-0.0014	-0.0044	0.0032	-0.0117	0.0064	0.0007
	(0.0036)	(0.0038)	(0.0037)	(0.0038)	(0.0083)	(0.0214)	(0.0064)	(0.0072)	(0.0065)	(0.0071)
2 years before (spell 2)	0.0014	-0.0006	-0.0041	-0.0064*	0.0028	-0.0026	0.0047	-0.0144**	0.0073	-0.0012
	(0.0035)	(0.0038)	(0.0035)	(0.0038)	(0.0075)	(0.0212)	(0.0059)	(0.0068)	(0.0059)	(0.0067)

1 year before (spell 2)	0.0013	0.0012	-0.0016	-0.0064*	0.0030	-0.0200	-0.0015	-0.0129**	0.0061	0.0019
	(0.0035)	(0.0037)	(0.0036)	(0.0038)	(0.0072)	(0.0200)	(0.0060)	(0.0061)	(0.0060)	(0.0064)
1 year after (spell 1)	0.0018*	0.0033***	0.0026**	-0.0013	0.0143***	0.0028	0.0023	0.0000	-0.0036	0.0033
	(0.0010)	(0.0011)	(0.0012)	(0.0011)	(0.0033)	(0.0060)	(0.0023)	(0.0023)	(0.0023)	(0.0025)
2 years after (spell 1)	0.0046***	0.0049***	0.0037**	-0.0012	0.0116***	0.0109	0.0046	0.0039	-0.0036	0.0041
	(0.0015)	(0.0017)	(0.0016)	(0.0017)	(0.0043)	(0.0080)	(0.0031)	(0.0035)	(0.0031)	(0.0035)
3 years after (spell 1)	0.0057***	0.0059***	0.0059***	-0.0012	0.0136***	0.0201**	0.0073*	0.0017	-0.0028	0.0061
	(0.0017)	(0.0020)	(0.0020)	(0.0021)	(0.0050)	(0.0093)	(0.0038)	(0.0040)	(0.0038)	(0.0043)
4 years after (spell 1)	0.0037*	0.0044*	0.0089***	0.0020	0.0126**	0.0255**	0.0022	-0.0049	0.0005	0.0069
	(0.0020)	(0.0023)	(0.0023)	(0.0025)	(0.0057)	(0.0105)	(0.0044)	(0.0047)	(0.0046)	(0.0050)
5 years after (spell 1)	0.0053**	0.0061**	0.0076***	0.0035	0.0151**	0.0301***	-0.0033	-0.0098*	0.0000	0.0062
	(0.0022)	(0.0026)	(0.0026)	(0.0028)	(0.0064)	(0.0114)	(0.0049)	(0.0052)	(0.0051)	(0.0056)
> = 6 years after (spell 1)	0.0155***	0.0198***	0.0038	-0.0025	-0.0090	0.0578***	0.0072	-0.0116	0.0033	0.0009
	(0.0032)	(0.0038)	(0.0040)	(0.0044)	(0.0086)	(0.0133)	(0.0070)	(0.0073)	(0.0074)	(0.0078)
1 year after (spell 2)	0.0011	0.0029*	0.0002	0.0006	0.0080**	-0.0094	0.0047	0.0002	-0.0032	-0.0027
	(0.0015)	(0.0016)	(0.0016)	(0.0017)	(0.0038)	(0.0075)	(0.0031)	(0.0026)	(0.0023)	(0.0020)
2 years after (spell 2)	0.0018	0.0046**	0.0006	0.0024	0.0069	-0.0159	0.0054	0.0023	-0.0063*	-0.0028
	(0.0021)	(0.0023)	(0.0023)	(0.0025)	(0.0054)	(0.0101)	(0.0039)	(0.0038)	(0.0035)	(0.0033)
3 years after (spell 2)	0.0041	0.0039	0.0004	0.0026	0.0053	-0.0230**	0.0088*	0.0030	-0.0048	-0.0033
	(0.0026)	(0.0028)	(0.0028)	(0.0030)	(0.0063)	(0.0114)	(0.0047)	(0.0046)	(0.0047)	(0.0044)
4 years after (spell 2)	-0.0029	-0.0025	0.0061*	0.0069**	0.0049	-0.0285**	0.0089	0.0009	-0.0088	-0.0012
	(0.0030)	(0.0033)	(0.0032)	(0.0034)	(0.0073)	(0.0123)	(0.0057)	(0.0056)	(0.0057)	(0.0057)
5 years after (spell 2)	-0.0029	-0.0012	0.0077**	0.0112***	0.0074	-0.0346**	0.0080	0.0059	-0.0100	0.0010
	(0.0034)	(0.0037)	(0.0037)	(0.0040)	(0.0083)	(0.0143)	(0.0067)	(0.0069)	(0.0067)	(0.0068)
> = 6 years after (spell 2)	0.0093*	0.0088	0.0026	0.0036	-0.0198*	-0.0663***	0.0021	0.0083	-0.0161*	0.0029
	(0.0050)	(0.0055)	(0.0055)	(0.0058)	(0.0109)	(0.0164)	(0.0091)	(0.0097)	(0.0093)	(0.0100)
Age	0.0058***	0.0004	0.0014	-0.0022***	0.0177***	0.0628***	0.0086***	0.0097***	0.0097***	0.0077**
	(0.0010)	(0.0011)	(0.0015)	(0.0008)	(0.0015)	(0.0052)	(0.0009)	(0.0011)	(0.0030)	(0.0035)

Age squared	-0.0000***	0.0000***	0.0001***	0.0001***	-0.0002***	-0.0005***	0.0000***	0.0000**	-0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Number of children	-0.0000	-0.0012	-0.0067***	-0.0023	0.0192***	0.0096	-0.0037	-0.0040	-0.0147***	-0.0061
	(0.0018)	(0.0020)	(0.0019)	(0.0021)	(0.0041)	(0.0221)	(0.0032)	(0.0034)	(0.0034)	(0.0038)
Emp't status (working)	-0.0099***	0.0018	-0.0195***	-0.0239***	0.0613***	0.0038	-0.0129***	-0.0318***	-0.0154***	-0.0039
	(0.0022)	(0.0029)	(0.0029)	(0.0037)	(0.0055)	(0.0079)	(0.0048)	(0.0066)	(0.0049)	(0.0064)
Marital status (married)	0.0125***	0.0176***	0.0182***	0.0204***	0.1911***	-0.0205	0.0055	0.0142**	-0.0194***	0.0091
	(0.0031)	(0.0037)	(0.0036)	(0.0039)	(0.0083)	(0.0198)	(0.0061)	(0.0067)	(0.0065)	(0.0073)
Observations	697,455	580,699	674,345	571,785	215,700	86,990	217,865	179,197	218,237	178,727
Number of individuals	12,321	10,109	11,928	9,953	3,852	3,846	3,894	3,150	3,899	3,143
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country of residence fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Health controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

*DC – dental care; BP – blood pressure check-ups; GT – gynaecological test; MT – mammogram test; BT – blood test; VT – vision test. *, **, *** indicate significance at 10%, 5%, and 1%, respectively. Standard errors in parentheses. Standard errors are clustered at the individual level.*

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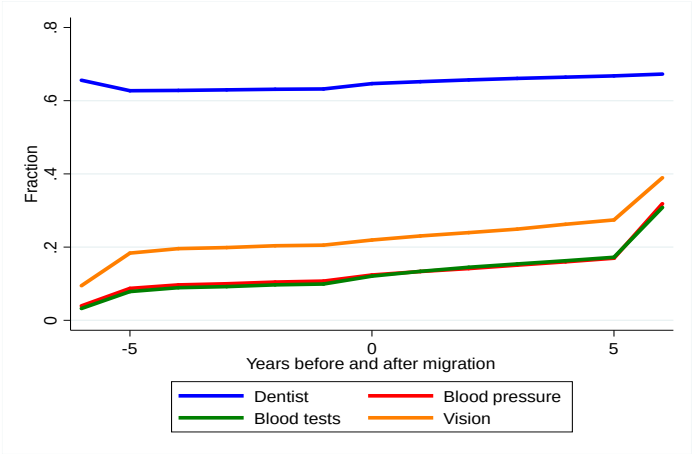
Appendix

Figure A1. Preventive healthcare for the years before and after migration



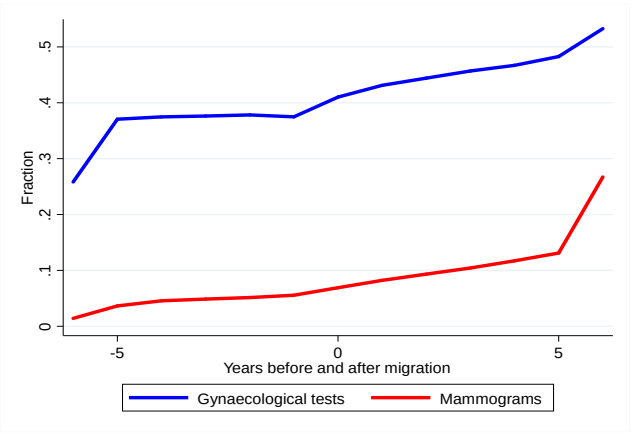


Figure A2. Preventive healthcare for the years before and after migration by region of origin