**Ethnic Health Inequalities in Europe.**

**The Moderating and Amplifying Role of Healthcare System Characteristics**

**Keywords**: ethnic inequality, health, multilevel modelling, comparative research, healthcare systems, intersectionality

**Abstract**

Health inequalities between ethnic majority and ethnic minority members are prevalent in contemporary European societies. In this study we used theories on socioeconomic deprivation and intersectionality to derive expectations on how ethnic inequalities in health may be exacerbated or mitigated by national healthcare policies. To test our hypotheses we used data from six waves of the European Social Survey (2002-2012) on 172,491 individuals living in 24 countries. In line with previous research, our results showed that migrants report lower levels of health than natives. In general a country’s healthcare expenditure appears to reduce socioeconomic differences in health, but at the same time induces health differences between recent migrants and natives. We also found that specific policies aimed at reducing socioeconomic inequalities in health appeared to work as intended, but as a side-effect amplified differences between natives and recent migrants in self-assessed health and well-being. Finally, our results indicated that policies specifically directed at the improvement of migrants’ health, only affected well-being for migrants who have lived in the receiving country for more than 10 years.

***Introduction***

“The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race … or social condition” (WHO, 1946, p. 1). Research on various European societies and the United States has indicated however that ethnic minorities generally report poorer self-assessed health and have a higher risk of serious illness as compared to ethnic majority groups (Hadjar & Backes, 2013; Missinne & Bracke, 2012; Nielsen & Krasnik, 2010; Smedley, Stith, & Nelson, 2009; WHO, 2010; Wiking, Johansson, & Sundquist, 2004). The two most acknowledged and prominent explanations for these ethnic health inequalities are found in the lower socioeconomic status of migrants and in perceived discrimination of ethnic minority groups (Nazroo, 2003; Safi, 2010; Wiking et al., 2004). Contrarily, some studies showed that ethnic minorities suffer less from certain types of diseases (Darmon & Khlat, 2001; Rafnsson et al., 2013) or have lower mortality rates (Abraído-Lanza, Dohrenwend, Ng-Mak, & Turner, 1999; Razum, Zeeb, Akgün, & Yilmaz, 1998). In addition, there are indications for a so-called ‘healthy migrant effect’, that suggests that healthier people are physically and financially more likely to migrate (Darmon & Khlat, 2001; Kennedy, McDonald, & Biddle, 2006; Malmusi, Borrell, & Benach, 2010), whereas others put forward that in times of illness, retirement or unemployment migrants might return to their country of origin, known as the ‘salmon bias effect’ (Abraído-Lanza et al., 1999; Razum et al., 1998; Wallace & Kulu, 2014).

 Despite clear cross-national differences in ethnic health inequalities (Huijts & Kraaykamp, 2012; Safi, 2010) only few studies have tried to identify causes of this cross-national variation. The studies that did, suggested that strict integration policies are associated with poorer migrants’ health: ethnic minority groups may experience more health problems, a higher mortality risk, and lower well-being in European countries with stricter integration policies (Hadjar & Backes, 2013; Ikram, Malmusi, Juel, Rey, & Kunst, 2015). Additionally, ethnic minorities seem more disadvantaged in terms of well-being in higher income countries, and less so in countries with a family-oriented welfare system (Hadjar & Backes, 2013).

Studies dealing with alternative explanations for cross-national variation in ethnic health inequalities, however, are still lacking. It is particularly surprising that the role of healthcare systems has received little attention. Countries differ in the accessibility and affordability of their healthcare, and in the quality and extent of healthcare provision (Karanikolos et al., 2013; Wendt, Frisina, & Rothgang, 2009). Healthcare expenditure has often been linked to social inequalities in health (Fiscella, Franks, Gold, & Clancy, 2000; Mackenbach, 2012). Such inequalities may be smaller in countries with extensive healthcare systems with lower out-of-pocket payments, for this will increase access for all and reduce financial restrictions for the financially deprived (Balabanova et al., 2013). The potential impact of healthcare systems for ethnic health inequalities has been noted as well. For instance, a lack of resources for translators, time pressure on physicians, financing of healthcare, and availability of healthcare institutions affect the health of ethnic minorities more negatively than the health of the ethnic majority (Ingleby, 2011; Smedley et al., 2009).

In this study, we aim to move closer to the underlying mechanisms linking healthcare systems to ethnic health inequalities by examining the role of two specific domains in health policy: policies aimed at the reduction of socioeconomic inequalities in health, and policies targeting migrants’ health. First, because of the ubiquity and detrimental impact of socioeconomic inequalities in health (Mackenbach et al., 2008), several countries have implemented policies specifically aimed at reducing these inequalities. Apart from a reduction of socioeconomic inequalities in health, these policies may also diminish ethnic health disparities, given that ethnic minorities are overrepresented among the lower socioeconomic strata. Second, policies specifically targeting migrants’ health are usually national policies “that go beyond statutory or legal entitlements” to improve migrants’ health (Mladovsky, 2011, p. 186). For example, these policies may provide ‘cultural mediators’, instruction of health workers in cultural competence, and interpreters (Ingleby, 2011). To our knowledge, no previous study has considered these two health policy dimensions simultaneously to explain cross-national variation in ethnic inequalities in health. All in all, we answer the following research questions: *To what extent is the association between ethnicity and health moderated by a country’s (a) healthcare expenditure, (b) policies aimed at reducing socioeconomic inequalities in health, and (c) policies aimed at improving migrants’ health?*

To answer these questions, we examine ethnic inequalities in health in 24 European countries, using multilevel regression models to analyze pooled cross-sectional data on 172,491 individuals from six waves of the European Social Survey (2002-2012). Two indicators of health are studied: self-assessed health and well-being. This focus on indicators of self-rated health does justice to the WHO’s definition of health (WHO, 1946), which notes that health is “a state of complete physical, mental and social well-being”. While these indicators are subjective measures of health, self-assessed health is strongly associated with for instance mortality (DeSalvo, Bloser, Reynolds, He, & Muntner, 2006). We distinguish recent first-generation immigrants, non-recent first-generation immigrants and second-generation immigrants in dealing with ethnic inequalities, comparing them with native-born citizens of destination countries.

***Expectations: how healthcare systems affect migrants’ health***

Previous comparative studies on ethnic and social health inequalities are often undertheorized. Although several studies have shown how ethnic and social inequalities in health vary across countries, little has been done to explain this variation. In this study, we elaborate on theories of socioeconomic deprivation and intersectionality to demonstrate how and why national policies may sometimes have unexpected and unintended effects, focusing on ethnic inequalities in health as an exemplary case.

Theories on socioeconomic deprivation have been derived mostly from notions on material deprivation in the sociology of health, and from notions on human and cultural capital in the social sciences (e.g. Bourdieu, 1986). In short, the most essential implication of deprivation theory is that ethnic inequalities in health are caused by disadvantages in material resources, access to healthcare and information among ethnic minorities. Since ethnic minorities are overrepresented in lower socioeconomic groups (Koopmans, 2010; Van Tubergen, Maas, & Flap, 2004), ethnic minorities would be more strongly affected by socioeconomic deprivation than ethnic majority members. Indeed, it has been shown repeatedly that people’s socioeconomic position is positively related to health (e.g. Eikemo, Huisman, Bambra, & Kunst, 2008; Mackenbach et al., 2008; Marmot, 2004). A higher level of education facilitates the understanding of and access to information about healthcare and healthy lifestyles, and higher incomes permit better housing conditions and access to private healthcare.

Based on deprivation theory, we expect healthcare systems to have a vital role in reducing ethnic inequalities in health. After all, affordable and accessible healthcare in a country would mostly benefit people from lower income groups who lack financial resources to pay for high-quality medical treatment. Similarly, health promotion campaigns would have the strongest positive effect for people from lower educational groups who often lack information about healthy lifestyles and healthcare services, and who may need additional support in implementing already available information on health risks. A main strategy to tackle ethnic inequalities in health therefore would be to address the underlying cause for this health disadvantage of ethnic minorities (i.e., socioeconomic deprivation). Subsequently, higher (government) expenditure on healthcare ensures that high quality healthcare is accessible, and especially lower socioeconomic strata are expected to benefit from higher expenditures (Karanikolos et al., 2013). As a result, we expect that higher expenditure on healthcare may reduce differences in health across ethnic groups, since it reduces the negative consequences of socioeconomic deprivation on health. In addition, from deprivation theory it is expected that national policies explicitly aimed at reducing socioeconomic inequalities in health would also be successful in mitigating ethnic health inequalities since they target ethnic minorities’ socioeconomic deprivation.

Although it is often readily assumed that policies aimed at reducing socioeconomic inequalities in health would mitigate ethnic inequalities in health, this is not necessarily evident. Based on intersectionality theory we arrive at different expectations. Originating in the field of critical political theory and feminist studies, intersectionality theory was initially applied to intersections of race and gender in describing deprivation and disadvantages among women from ethnic minorities (Crenshaw, 1989). Intersectionality theory revolves around the idea that multiple dimensions of inequality, power and disadvantage cannot be separated or studied in isolation (Bauer, 2014; Kapilashrami, Hill, & Meer, 2015). For example, a disadvantage experienced by African American women is not simply the sum of racial inequality and gender inequality, but a unique cumulative position of multiple disadvantages (Crenshaw, 1989; Weber & Parra-Medina, 2003). In the past few years, intersectionality theory has been applied increasingly in research on health, and recently also in comparative studies on health inequality (Bekker, 2003; Hankivsky, 2012; Iyer, Sen, & Ostlin, 2008).

A central argument derived from this theory is that ethnic inequalities in health are caused by more than socioeconomic deprivation alone. After all, intersectionality theory would contend that dimensions of ethnic disadvantage and socioeconomic disadvantage intersect (Bauer, 2014): people from ethnic minority groups are not only more likely to experience socioeconomic disadvantages, but their ethnicity adds a further disadvantage (Fiscella et al., 2000). More specifically, ethnic minorities would experience barriers in making use of the interventions following from policies directed at the reduction of social health inequalities (Hankivsky & Cormier, 2011). Language barriers, cultural differences in the use of healthcare, and communication with health professionals may make it difficult for ethnic minorities to reap the benefits of affordable and accessible healthcare and of health promotion campaigns (Ingleby, 2011). Consequently, policy measures to counter socioeconomic deprivation may not always reach socioeconomically disadvantaged minorities, and may remain mostly beneficial for natives (Palència, Malmusi, & Borrell, 2014). Similarly, ethnic minorities may benefit less from a country’s higher expenditure on healthcare than members of the ethnic majority, because of language barriers and cultural differences in the use of healthcare. This could therefore result in larger ethnic differences in health, because ethnic minorities would benefit less than the majority. This leads to the following hypotheses:

(H1) *In countries with higher healthcare expenditures ethnic health inequalities are stronger than in countries with lower healthcare expenditures*.

(H2) *In countries with policies aimed at reducing socioeconomic health inequalities, ethnic health inequalities are stronger than in countries without such policies.*

Next to policies aimed at reducing socioeconomic disparities in health, policies targeted at migrants’ health may also influence ethnic disparities in health (Mladovsky, 2011). Policies aimed at supporting migrants’ health are likely to be more successful in reducing ethnic health inequalities according to intersectionality theory than governmental policies aimed at socioeconomic health inequalities. After all, these policies specifically address the barriers that limit full and appropriate use of the services and information offered by a country’s healthcare system (e.g. by providing interpreters and health promotion campaigns in multiple languages). As such, much more so than policies aimed at reducing socioeconomic inequalities in health, a country’s policy targeting migrants’ health does justice to the idea that socioeconomic deprivation and ethnic disadvantages intersect (Hankivsky & Cormier, 2011). From this, we derive our third hypothesis:

(H3) *In countries with policies aimed at improving migrants’ health, ethnic health inequalities are weaker than in countries without such policies.*

Additionally, based on intersectionality theory we expect that the effects of both types of policies (directed at the reduction of socioeconomic and ethnic health inequalities) and healthcare expenditure would be strongest for recent first-generation immigrants. After all, this group is likely to struggle more with the cultural, informational and language barriers described above than non-recent immigrants and second-generation immigrants.

***Data and measurements***

**Data description**

To test our hypotheses, we used the European Social Survey (ESS) which has been conducted from 2002 every two years as a repeated cross-sectional survey (see www.europeansocialsurvey.org). The ESS includes information on people aged 15 years and older living in private households. Currently, six waves are available encompassing 154 available country-year combinations across 35 countries. Due to missing information on policy indicators eleven countries had to be excluded from the sample: Cyprus, Croatia, Iceland, Israel, Kosovo, Luxembourg, Latvia, Russia, Slovakia, Turkey, and Ukraine. People younger than 25 years were excluded from the dataset because of possible unfinished educational careers. Respondents older than 75 years were excluded to deal with the issue of health selection at older ages. Finally, in our analyses we focused on health inequalities between natives and non-Western migrants. Western migrants were excluded because of the more limited linguistic and cultural distance to natives. By focusing on non-Western migrants we expect to provide stronger tests of actual effects of migrant health policies, because these policies are often especially directed at non-Western migrants (Mladovsky, 2011). After these restrictions, 172,491 respondents nested in 24 countries and 125 country-year combinations are used for the analyses. For descriptive statistics of all individual level and country-year level variables we refer to Table 1. Respondents were primarily excluded from the analyses because of missing information on the macro-level (11 countries), our age selection, and our focus on migrants of non-Western descent. A small additional loss of cases was due to missing information on individual-level variables (3.1%, primarily regarding marital status, employment status, and educational attainment).

Even though the ESS data were not designed to explicitly target migrants, a substantial part of the respondents could be characterised as first- or second-generation immigrants. Because interviews were held in the official language(s) of the destination countries, poorly integrated migrants likely will be underrepresented in the ESS (Huijts & Kraaykamp, 2012). This makes the testing of our hypotheses relatively strict, and will likely lead to conservative estimates of the effects of policy measures on ethnic inequalities in health.

**Dependent variables**

We employed two indicators of health in our study: self-assessed general health and well-being. Together, these indicators provide a comprehensive assessment of people’s health measuring both mental and physical dimensions. Starting with *self-assessed general health*, respondents were asked: “How is your health in general? Would you say it is very good, good, fair, bad, or, very bad?”. We used the original ordinal variable for our analyses, but reversed the scores (ranging from 0 to 4) to ensure that a higher score refers to better health.

 *Well-being* is measured with two questions: “Taking all things together, how happy would you say you are?” and “All things considered, how satisfied are you with your life as a whole nowadays?” (e.g. Hadjar & Backes, 2013; Soons & Kalmijn, 2009). These two items consider well-being on the one hand as an emotional or affective state and on the other hand indicate that well-being is the result of a cognitive process (Peiró, 2006). Answer categories range from 0 (“extremely unhappy” and “extremely dissatisfied” respectively) to 10 (“extremely happy” and “extremely satisfied” respectively). We averaged scores on both items to create a scale ($∝=$.829).

**Individual-level independent variables**

*Migrant status* distinguishes natives from first- and second-generation migrants. Respondents were asked: “Were you born in [survey country]?” If they answered negatively, they were asked for their country of birth. A similar question was asked for both parents, with the exception of the 2002 round where only the continent of birth was asked. For first- and second-generation immigrants we only selected migrants from non-Western countries. Non-Western countries were operationalized as non-members of the Organization for Economic Co-operation and Development (OECD). If respondents reported not to be born in the survey country they were coded as first-generation immigrants. When respondents were born in the survey country, but either father or mother was not, respondents were coded as second-generation migrant. When both parents were born in different countries, maternal country of birth was used to distinguish Western from non-Western migrants. To distinguish recent immigrants we used length of stay in their destination country. Hence, we arrived at a four category indicator of *migrant status*: natives (reference), first-generation immigrant (less than 10 years in destination country), first-generation immigrant (more than 10 years in destination country), and second-generation immigrant.

*Educational attainment* was measured with the ISCED-classification of successfully completed level of education. Categories were recoded into three educational levels (i.e., primary, secondary, and tertiary education) to simplify estimating cross-level interaction effects.

We controlled for four individual level characteristics that are distributed unevenly across migrants and natives, and which have been consistently related to health outcomes in prior research. *Employment status* was measured asking respondents’ main daily activity in the past seven days. For reasons of parsimony, we distinguished between paid work, unemployed and other (all other categories). *Gender* was coded 1 for women and 0 for men. *Age* was used as a continuous variable. A quadratic term for age was included to control for possible non-linearity. *Marital status* was operationalized in four groups: married/civil union (reference), divorced or separated, widowed, and single.

**Country-level variables**

We used two indicators of a country’s healthcare expenditure: expenditures as percentage of GDP (*healthcare expenditure*), and the percentage of expenditures funded by the government (*governmental healthcare expenditure*). The first feature was derived from World Bank figures (see http://data.worldbank.org/), and the second one was obtained from WHO (2014). Both measures varied across countries and across waves. Hence, scores on these variables vary for country-year combinations.

A country’s *policy to reduce socioeconomic health inequality* was measured using the policy database, called the ‘European Portal for Action on Health Inequalities’ (www.health-inequalities.eu). These policies targeting lower socioeconomic groups include among others providing information on health, promoting healthy dietary and activity customs, and subsidizing social housing. For this policy measurement it was not possible to construct country measurements that vary over time; we do not have information to determine when each policy was implemented, and whether policies existed in the past but have now ended. Hence, if countries implemented policies aimed at reducing socioeconomic health inequalities within the timeframe 2002-2012, they scored 1 on this variable (16 countries), and otherwise a 0 (8 countries).

A country’s *policy aimed at improving migrants’ health* is based on Mladovsky’s (2011) inventory of policies of 25 European countries. Such policies may include providing interpreters and the training of healthcare practitioners in intercultural competencies (Ingleby, 2011). In a country-year a score of 1 is given if specific migrant policy measures are in place, otherwise the score is 0. In 10 out of the 24 ESS countries such policies have been established, and in 7 of these 10 countries this occurred during the 2002-2012 period.

At the country-year level, we first controlled for *GDP per capita* derived from the World Bank (see website http://data.worldbank.org/). For reasons of interpretation we divided it by 1,000. A (natural) log transformation was applied to deal with the occurrence of (very) low and high income countries. Second, we controlled for *social welfare expenditure*, measured as percentage of a country’s GDP (Eurostat, 2016). Dahl and Van der Wel (2013) found that social protection expenditures reduce educational inequalities in health. Thus, by controlling for social expenditure we reduce the possibility that our results reflect country variation in general spending on social protection, rather than variation in healthcare system features that we are most interested in. All country-year characteristics were grand-mean centered in the reported analyses.

In Table 2 it is shown in how many country-year combinations policies aimed at improving migrants’ health and policies aimed at reducing socioeconomic disparities in health were implemented. Of all 125 country-year combinations in 26 (20.8%) combinations both types of policies where implemented while in 22 combinations (17.6%) none of the policies were in effect. In 18 (14.4%) country-year combinations only migrant health policies were implemented, while in 59 (47.2%) only policies were in effect aimed to reduce socioeconomic differences in health. Figure 1 shows that there is no clear correlation between money spent on healthcare in a country and how much of this is covered by the government; countries vary strongly in the relative amount spent on healthcare as a percentage of GDP.

 [Table 1 about here]

 [Table 2 about here]

 [Figure 1 about here]

 Figure 1: Scatter plot of government health expenditure by total health expenditure.

***Analytic strategy***

To deal with the hierarchical structure of our data, i.e. individuals nested in country-year combinations, multilevel analyses were employed. A major advantage of using country-year combinations instead of countries is that it increases the number second level cases, and it allows for over-time variation within countries. To test our hypotheses, multilevel linear regression analyses using the lme4 package in R were performed. The estimation of variance components at the individual and country-year level in empty models (not presented in tables) showed that 18.4% of variation in individual well-being can be explained by variation between country-year combinations (ICC=.184). Variation in subjective health is for 9.2% due to differences between country-year combinations (ICC=.092).

In our modelling strategy, we first examine main effects of ethnicity and education on the two health outcomes in model 1 (Table 3) and model 3 (Table 4). In model 2 (Table 3) we present cross-level interaction effects between education and migrant status and the two measures of healthcare expenditure. These effects indicate whether ethnic and educational health inequalities are buffered or amplified by healthcare expenditures. In model 4 (Table 4) we explicitly test our hypotheses on specific policy measures directed to reduce socioeconomic and ethnic inequalities in health. Finally, sensitivity analyses are discussed at the end of the results section to check for robustness.

***Results***

In models 1 (Table 3) and 3 (Table 4) we observe a clear relationship between migrant status and health; non-recent first-generation migrants and second-generation migrants generally report a lower level of general health (b=-0.112 and b=-0.083 respectively in model 1) and well-being (b=-0.273 and b=-0.231 respectively in model 1) than natives. For recent first-generation migrants the results differ slightly; while they do report a lower level of well-being than natives (b=-0.397 in model 1), no differences are found in the level of general health. The relationship between education and the health measures is also as expected: the higher the respondents’ level of education, the better general health (b=0.147 and b=0.279 for secondary and tertiary educated respectively in model 1) and well-being (b=0.213 and b=0.445 for secondary and tertiary educated respectively in model 1).

 Furthermore, in model 1 (Table 3) the level of healthcare expenditure as a percentage of total GDP is associated with a lower level of general health (b=-0.053) and well-being (b=-0.185). A higher government share in health expenditure is associated with lower levels of general health (b=-0.009), but not with a lower level of well-being. People in countries with policies to reduce socioeconomic inequalities in health have on average a lower level of general health (b=-0.103), but report higher levels of well-being (b=0.287) in model 3 (Table 4). Lastly, in general people’s health is not affected by whether countries have implemented policies targeting migrants’ health. Note that these main effects of macro indicators merely serve as a reference to the cross-level interaction estimates in our further modelling.

 In the second models in Table 3 the cross-level interactions between (government) healthcare expenditure, migrant status, education, and health are shown to test hypothesis 1. These results indicate that higher government healthcare expenditure increases the gap in general health (b=-0.008) and well-being (b=-0.019) between recent first-generation migrants and natives, and marginally between second-generation migrants and natives in well-being (b=-0.10). Other migrant groups are not affected differently from natives by government healthcare expenditure. Total healthcare expenditure as percentage of the GDP is associated with a larger difference in well-being between recent first-generation migrants and natives (b=-0.086), but not with differences in general health or between other migrant groups. All in all, these results suggest that a nation’s level of healthcare expenditure only affects the health gap between natives and immigrants who arrived in the destination country less than 10 years ago. The results for educational inequalities in health are more straightforward. Both higher levels of government’s share of healthcare expenditure and higher levels of total healthcare expenditure are associated with smaller differences in health between educational groups in general health as well as in well-being.

In Table 4 (model 4 for general health and well-being) the results are shown regarding the tests of hypotheses 2 and 3. Policies aimed at reducing socioeconomic differences in health indeed appear to reduce educational differences in well-being, but only marginally diminish educational differences in general health. These policies do however appear to disadvantage recent first-generation migrants compared to natives; inequalities in general health and well-being between recent migrants and natives are larger in countries that have implemented policies aimed at reducing socioeconomic inequalities in health (b=-0.119 and b=-0.349 respectively). Policies targeting socioeconomic differences in health appear not to influence health inequalities between non-recent first-generation migrants, second-generation migrants, and natives.

Regarding policies aimed at reducing migrants’ disadvantages in health, these policies appear to benefit migrants only marginally. The gap in well-being between recent first-generation and second-generation immigrants and natives is not affected by these policies. Differences between recent migrants and natives are marginally smaller in countries which have implemented these policies (b=0.063). Also, we do find an indication that differences in well-being between natives and non-recent migrants are smaller in countries that have implemented policies aimed at improving migrants’ health (b=0.213).

 We conducted several sensitivity analyses to check the robustness of our results, which are available upon request. These include (1) stepwise inclusion of all interaction coefficients, (2) removing potential influential country-wave combinations, (3) conducting three-level analyses of country-year combinations nested within countries, and (4) including dummies for the countries of origin to control for composition of the migrant population. Overall, the results of these sensitivity analyses (available on request) did not lead to substantively different conclusions.

[Table 3 about here]

[Table 4 about here]

***Conclusions and discussion***

In this study we investigated the relationship between healthcare system characteristics and ethnic health inequalities. We were particularly interested in the role of healthcare expenditure and healthcare policies, because of their potential to reduce ethnic inequalities in European countries. Theories on socioeconomic deprivation and intersectionality guided our expectations, and suggest that inequalities in health sometimes may even be amplified rather than buffered by national policies. More specifically, we investigated to what extent ethnic inequalities in health in Europe are moderated by a country’s healthcare expenditures, policies to reduce socioeconomic inequalities in health, and specific policies to improve migrants’ health. Information on individuals living in 24 European countries (2002-2012) was used to answer these questions and two indicators of health were examined: self-assessed general health and well-being.

 We found poorer health among migrants compared to natives for both health indicators. Moreover, features of a country’s healthcare system do clearly relate to ethnic inequalities in health: all three explanatory aspects we investigated appear to influence the relationship between migrant status and health. First, our results indicate that higher healthcare expenditures in a country are related to wider ethnic inequalities in health for first-generation immigrants. Second, we found that educational inequalities in health were consistently smaller in countries with higher healthcare expenditures. In these countries ethnic health differences appear larger, which suggests that ethnic minority members do not benefit from more spending on healthcare in similar ways as ethnic majority members do. This is despite the overrepresentation of ethnic minorities among lower socioeconomic strata (Koopmans, 2010; Van Tubergen et al., 2004).

 We also performed analyses to examine the consequences of specific policies to reduce socioeconomic health inequalities and of policies targeting migrants’ health. We found that policies aimed at reducing socioeconomic inequalities in health are related to smaller educational inequalities in health. However, for first generation migrants (less than 10 year in the destination country) these policies appear to amplify the ethnic gap in self-assessed general health and well-being. Healthcare policies directly aimed to improve migrants’ health appear to only reduce ethnic inequalities in well-being, but not in general health, and only for first generation migrants living more than 10 years in a destination country.

 Taken together, our findings may have notable implications for research on ethnic inequalities in health, for research on the link between healthcare systems and health outcomes, and for comparative research on social inequalities in health more generally. Our findings indicate that especially recent immigrants are inable of making full use of health policies. As a consequence successful policies aiming to reduce socioeconomic inequalities in health could bear the unintended consequence of increasing a health gap between natives and recent migrants. Intersectionality theory appeared helpful to find an explanation for this puzzling finding. As suggested by this theory, a combined disadvantage of being part of an ethnic minority group and belonging to a lower socioeconomic group seems to be a greater detriment than socioeconomic deprivation alone (Bauer, 2014). Whereas the native population with lower levels education appeared to benefit from policies to improve access to healthcare and information, socioeconomically disadvantaged members of ethnic minority groups face particular barriers that prevent a full use of services offered by these policies (Hankivsky & Cormier, 2011). For example, limited language proficiency may mean that health promotion campaigns are completely lost on considerable numbers of recent immigrants (Ingleby, 2011). On the other hand, however, our results also suggest that policies targeted at migrants’ health are not necessarily an answer to this. Although these policies help to increase well-being among non-recent first generation immigrants, we do not find that they benefit the most recent immigrants. Additionally, it is interesting to note that healthcare policies targeted at migrants’ health mostly appear to benefit their mental well-being, while we did not find any substantial impact of these policies on ethnic differences in general health. This may suggest that benefits of these policies may lie mostly in changing perceptions of acceptance and discrimination rather than in improving access to and the use of healthcare services and health promotion.

This study investigated ethnic inequalities in health through an innovative strategy which showed how institutional indicators affected migrants and natives differently, but there are some limitations to our approach as well. Firstly, despite our focus on specific areas of health policy in addition to general measures of healthcare, our health policy indicators are still fairly broad and heterogeneous. As a result, it still remains difficult to distinguish which concrete policy interventions are most effective in reducing ethnic health inequalities. For this end, future research may benefit from (longitudinal) quasi-experimental policy evaluations. Secondly, the used data measuring country policies may be improved, particularly regarding the policies aimed at reducing socioeconomic health inequalities. Thirdly, although we managed to analyze two health outcomes covering physical and mental dimensions of health, both indicators were self-reported. Although self-reports have shown to be strongly related to morbidity and mortality (DeSalvo et al., 2006), future research may want to investigate other health outcomes. Fourthly, migrants in our data may not be fully representative of migrant populations in Europe. It is likely that our sample refers to a selection of relatively well-integrated (legal) migrants. This makes that our results are most likely conservative estimates, since the situation for less integrated migrants is probably worse. Fifthly, with cross-sectional data we are unable to establish whether ethnic health inequalities are due to a causal effect of migrant status on health, or whether they are partly a result of the selection of healthy people for migration. With cross-sectional data any claim on causality cannot be substantiated. Hence, in theory it also is possible that policies were established in reaction to exceptionally large ethnic health inequalities to start with. We expect however that this is highly unlikely, because policies need time to be effective and the time frame of our study is rather limited.

In sum, using aspects of a country’s healthcare system to study ethnic health inequalities this study has indicated that policies that aim to reduce social inequality in health on one dimension of health inequality (in this case, education) could unintentionally induce social inequalities in health on another dimension. Therefore, more attention is needed for the intersectionality of dimensions of social inequality, for the interplay between specific domains of health policy and social policy, and for how this may result in adverse and unintended consequences for some social groups. A more detailed and in-depth analysis of how healthcare policy influences social inequality in health across European countries is needed to achieve this.

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| Table 1. Descriptive statistics of dependent variables, individuals characteristics and country-year characteristics before grand-mean centering (n=172,491, N=125) |
|   | Min. | Max. | Mean/% | Std. Deviation |
| *Individual characteristics (n=*172,491) |  |  |  |  |
| *Dependent variables* |  |  |  |  |
| General health | 0 | 4 | 2.774 | 0.897 |
| Well-being | 0 | 10 | 6.977 | 2.008 |
| *Independent variables*  |   |   |   |   |
| Migrant status |  |  |  |  |
|  Native |  |  | 93.667 |  |
|  1st generation migrant, < 10 years |  |  | 1.413 |  |
|  1st generation migrant, > 10 years |  |  | 3.162 |  |
|  2nd generation |  |  | 1.757 |  |
| Education |  |  |  |  |
|  Primary education |  |  | 29.818 |  |
|  Secondary education |  |  | 38.954 |  |
|  Tertiary education |  |  | 31.228 |  |
| Employment status |  |  |  |  |
|  Employed |  |  | 57.197 |  |
|  Unemployed |  |  | 5.782 |  |
|  Other |  |  | 37.021 |  |
| Age | 25 | 75 | 49.209 | 13.943 |
| Marital status |  |  |  |  |
|  Married/partnership |  |  | 61.423 |  |
|  Divorced/separated |  |  | 11.139 |  |
|  Widowed |  |  | 7.342 |  |
|  Never married/partnership |  |  | 20.095 |  |
| Gender (0=male; 1=female) |  |  | 53.199 |  |
|  |  |  |  |  |
| *Country-year characteristics (N=125)* |   |   |   |   |
| Government healthcare expenditure | 56.000 | 90.000 | 74.184 | 7.698 |
| Healthcare expenditure | 4.987 | 12.437 | 8.974 | 1.649 |
| Socioeconomic health policy (0=no; 1=yes) |  |  | 68.000 |  |
| Migrant health policy (0=no; 1=yes) |  |  | 35.200 |  |
| GDP (log) | 2.436 | 4.195 | 3.403 | 0.369 |
| Social protection expenditure | 12.000 | 33.300 | 24.170 | 4.872 |
| Source: European Social Survey 2002-2012. |

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| Table 2: The number of country-year combinations which have implemented policies aimed at reducing differences in health between socioeconomic and/or migrant groups. |
| Socioeconomic health policy |  | Migrant health policy |  |
|  | No | Yes | Total |
| No | 22 | 18 | 40 |
| 17.6% | 14.4% | 32.0% |
| Yes | 59 | 26 | 85 |
| 47.2% | 20.8% | 68.0% |
| Total | 81 | 44 | 125 |
|  |  | 64.8% | 35.2% | 100.0% |
| Source: ESS 2002-2012  |

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| Table 3. Results of multilevel models regressing general health and well-being on cross-level interactions between migrant status, education, and healthcare expenditure and controls  |
|  | General health | Well-being |
|   | Model 1 | Model 2 | Model 1 | Model 2 |
|   | B |   | SD | B |   | SD | B |   | SD | B |   | SD |
| Intercept | 2.766 | \*\*\* | 0.016 | 2.764 | \*\*\* | 0.018 | 6.994 | \*\*\* | 0.042 | 6.995 | \*\*\* | 0.063 |
| *Individual characteristics* |  |  |  |  |  |  |  |  |  |  |  |  |
| Migrant status (native=ref.) |  |  |  |  |  |  |  |  |  |  |  |  |
|  1st generation, < 10 years | -0.018 |  | 0.016 | -0.024 |  | 0.022 | -0.397 | \*\*\* | 0.036 | -0.352 | \*\*\* | 0.060 |
|  1st generation, > 10 years | -0.112 | \*\*\* | 0.011 | -0.109 | \*\*\* | 0.018 | -0.273 | \*\*\* | 0.025 | -0.271 | \*\*\* | 0.035 |
|  2nd generation | -0.083 | \*\*\* | 0.015 | -0.066 | \*\*\* | 0.017 | -0.231 | \*\*\* | 0.033 | -0.206 | \*\*\* | 0.041 |
| Education (primary=ref.) |  |  |  |  |  |  |  |  |  |  |  |  |
|  Secondary education | 0.147 | \*\*\* | 0.005 | 0.148 | \*\*\* | 0.009 | 0.213 | \*\*\* | 0.012 | 0.216 | \*\*\* | 0.023 |
|  Tertiary education | 0.279 | \*\*\* | 0.005 | 0.287 | \*\*\* | 0.011 | 0.445 | \*\*\* | 0.012 | 0.472 | \*\*\* | 0.037 |
| *Country-year characteristics* |  |  |  |  |  |  |  |  |  |  |  |  |
| Gov. healthcare exp. (GHE) | -0.009 | \*\*\* | 0.002 | -0.005 | \* | 0.003 | 0.009 |  | 0.006 | 0.043 | \*\*\* | 0.009 |
| Healthcare exp. (HE) | -0.053 | \* | 0.021 | -0.034 |  | 0.021 | -0.185 | \*\* | 0.059 | 0.078 |  | 0.056 |
| *Cross-level interactions* |  |  |  |  |  |  |  |  |  |  |  |  |
|  1st gen., < 10 years \* GHE |  |  |  | -0.008 | \*\* | 0.003 |  |  |  | -0.019 | \* | 0.007 |
|  1st gen., > 10 years \* GHE |  |  |  | -0.003 |  | 0.002 |  |  |  | -0.006 |  | 0.005 |
|  2nd generation \*GHE |  |  |  | 0.000 |  | 0.003 |  |  |  | -0.010 | # | 0.006 |
|  1st gen., < 10 years \* HE |  |  |  | -0.005 |  | 0.016 |  |  |  | -0.086 | \* | 0.042 |
|  1st gen., > 10 years \* HE |  |  |  | -0.003 |  | 0.011 |  |  |  | 0.023 |  | 0.020 |
|  2nd generation \* HE |  |  |  | 0.003 |  | 0.008 |  |  |  | 0.027 |  | 0.021 |
|  Secondary educ. \* GHE |  |  |  | -0.005 | \*\*\* | 0.001 |  |  |  | -0.017 | \*\*\* | 0.003 |
|  Tertiary education \* GHE |  |  |  | -0.003 | # | 0.001 |  |  |  | -0.028 | \*\*\* | 0.005 |
|  Secondary education \* HE |  |  |  | -0.020 | \*\*\* | 0.006 |  |  |  | -0.038 | \*\* | 0.014 |
|  Tertiary education \* HE |  |  |  | -0.027 | \*\*\* | 0.007 |  |  |  | -0.089 | \*\*\* | 0.023 |
| Variance |   |   |   |  |  |  |  |  |  |  |  |  |
| Intercept: Country/year level | 0.028 |  | 0.166 | 0.038 |  | 0.196 | 0.208 |  | 0.456 | 0.480 |  | 0.693 |
| Intercept: Individual level | 0.612 |  | 0.782 | 0.609 |  | 0.780 | 3.033 |  | 1.742 | 2.997 |  | 1.731 |
| Slope: 1st generation, < 10 years |  |  |  | 0.012 |  | 0.107 |  |  |  | 0.151 |  | 0.388 |
| Slope: 1st generation, > 10 years |  |  |  | 0.019 |  | 0.138 |  |  |  | 0.061 |  | 0.247 |
| Slope: 2nd generation |  |  |  | 0.006 |  | 0.078 |  |  |  | 0.045 |  | 0.211 |
| Slope: Secondary education |  |  |  | 0.007 |  | 0.082 |  |  |  | 0.049 |  | 0.222 |
| Slope: Tertiary education |   |   |   | 0.012 |  | 0.109 |  |  |  | 0.151 |  | 0.388 |
| -2 Log likelihood |  | 405237.000 |  | 404704.000 |  | 681467.200 |  | 679805.200 |
| Source: European Social Survey 2002-2012. n=172,491, N=125. \* p<.05, \*\* p<.01, \*\*\* p<.005. # p<.10, for macro- and interaction-coefficients. Analyses are controlled for employment status, age, age squared, marital status, gender, GDP, and social protection expenditure. |
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| Table 4. Results of multilevel models regressing general health and well-being on cross-level interactions between migrant status, education, and health policy and controls |
|   | General healthGeneral health | Well-beingWell-being |
|  | Model 3 | Model 4 | Model 3 | Model 4 |
|   | B |   | SD | B |   | SD | B |   | SD | B |   | SD |
| Intercept | 2.847 | \*\*\* | 0.034 | 2.843 | \*\*\* | 0.038 | 6.856 | \*\*\* | 0.091 | 6.665 | \*\*\* | 0.131 |
| *Individual characteristics* |  |  |  |  |  |  |  |  |  |  |  |  |
| Migrant status (native=ref.) |  |  |  |  |  |  |  |  |  |  |  |  |
|  1st generation, < 10 years | -0.018 |  | 0.016 | 0.030 |  | 0.040 | -0.397 | \*\*\* | 0.036 | -0.210 | \*\* | 0.109 |
|  1st generation, > 10 years | -0.112 | \*\*\* | 0.011 | -0.131 | \*\*\* | 0.035 | -0.273 | \*\*\* | 0.025 | -0.376 | \*\*\* | 0.070 |
|  2nd generation | -0.083 | \*\*\* | 0.015 | -0.040 |  | 0.034 | -0.231 | \*\*\* | 0.033 | -0.191 | \* | 0.085 |
| Education (primary=ref.) |  |  |  |  |  |  |  |  |  |  |  |  |
|  Secondary education | 0.147 | \*\*\* | 0.005 | 0.178 | \*\*\* | 0.018 | 0.213 | \*\*\* | 0.012 | 0.329 | \*\*\* | 0.045 |
|  Tertiary education | 0.279 | \*\*\* | 0.005 | 0.307 | \*\*\* | 0.021 | 0.445 | \*\*\* | 0.012 | 0.639 | \*\*\* | 0.076 |
| *Country-year characteristics* |  |  |  |  |  |  |  |  |  |  |  |  |
| Socioeconomic health policy(SHP) | -0.103 | \*\* | 0.035 | -0.082 | # | 0.042 | 0.287 | \*\* | 0.094 | 0.546 | \*\*\* | 0.153 |
| Migrant health policy (MHP) | -0.032 |  | 0.038 | -0.072 | \* | 0.035 | -0.162 |  | 0.103 | -0.125 |  | 0.078 |
| *Cross-level interactions* |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  1st gen., < 10 years \* SHP |  |  |  | -0.119 | \*\* | 0.042 |  |  |  | -0.349 | \*\* | 0.113 |
|  1st gen., > 10 years \* SHP |  |  |  | 0.031 |  | 0.038 |  |  |  | 0.037 |  | 0.075 |
|  2nd generation \*SHP |  |  |  | -0.030 |  | 0.037 |  |  |  | -0.080 |  | 0.093 |
|  1st gen., < 10 years \* MHP |  |  |  | 0.063 | # | 0.038 |  |  |  | 0.133 |  | 0.099 |
|  1st gen., > 10 years \* MHP |  |  |  | 0.016 |  | 0.033 |  |  |  | 0.213 | \*\* | 0.066 |
|  2nd generation \* MHP |  |  |  | -0.011 |  | 0.033 |  |  |  | 0.125 |  | 0.086 |
|  Secondary education \* SHP |  |  |  | -0.042 | # | 0.021 |  |  |  | -0.163 | \*\* | 0.055 |
|  Tertiary education \* SHP |  |  |  | -0.028 |  | 0.026 |  |  |  | -0.245 | \*\* | 0.092 |
| Variance |  |  |  |  |  |  |  |  |  |  |  |  |
| Intercept: Country/year level | 0.029 |  | 0.170 | 0.043 |  | 0.207 | 0.215 |  | 0.463 | 0.613 |  | 0.783 |
| Intercept: Individual level | 0.612 |  | 0.782 | 0.609 |  | 0.780 | 3.033 |  | 1.742 | 2.997 |  | 1.731 |
| Slope: 1st generation, < 10 years |  |  |  | 0.010 |  | 0.102 |  |  |  | 0.130 |  | 0.361 |
| Slope: 1st generation, > 10 years |  |  |  | 0.019 |  | 0.139 |  |  |  | 0.066 |  | 0.256 |
| Slope: 2nd generation |  |  |  | 0.005 |  | 0.071 |  |  |  | 0.058 |  | 0.240 |
| Slope: Secondary education |  |  |  | 0.009 |  | 0.096 |  |  |  | 0.066 |  | 0.257 |
| Slope: Tertiary education |  |  |  | 0.014 |  | 0.120 |  |  |  | 0.211 |  | 0.460 |
| -2 Log likelihood |  | 405243.000 |  | 404732.600 | 681470.800 | 679827.000 |
| Source: European Social Survey 2002-2012. n=172,491, N=125. \* p<.05, \*\* p<.01, \*\*\* p<.005. # p<.10, for macro- and interaction-coefficients. Analyses are controlled for employment status, age, age squared, marital status, gender, GDP, and social protection expenditure. |

Figure 1: Scatter plot of government health expenditure by total health expenditure.