

Comparison of self-perceived health between immigrants and natives in different EU countries within the context of type of health care system

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**UNIVERSITY OF SPLIT
SCHOOL OF MEDICINE**

PAULINE SCHLÜTER

**COMPARISON OF SELF-PERCEIVED HEALTH BETWEEN
IMMIGRANTS AND NATIVES IN DIFFERENT EU
COUNTRIES WITHIN THE CONTEXT OF TYPE
OF HEALTH CARE SYSTEM**

Diploma Thesis

Academic Year:

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Assist. Prof. Shelly Pranić, PhD

Split, July 2019

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1. INTRODUCTION

International migration has been increasing over the past few years across Europe (1,2). In fact, there has been no such influx of immigrants and refugees since the World War II (3). According to the UNHCR, the Office of the *United Nations High Commissioner for Refugees*, more than 1 million people arrived into the European Union by sea routes alone in 2015 (4) and 53.8 million migrants were estimated to live in the European Union (EU), making up 10.4% of its population (5). There have been many debates on policies on immigration control and integration for many years; however, very little is known on how they might be affecting immigrants' health (6). People from all over the world, leaving their homes and migrating to Europe, hope for financial stability, skilled work, for a safe home, a safe political or stable environmental situation. However, often they encounter discrimination and social pressure and commonly struggle with language and cultural barriers and these factors could influence their health.

With this new wave of immigrants in the EU, public health officials are reasonably concerned with immigrants' quality of health. The high rates of net immigration may increase pressure on healthcare services in EU countries (1). More studies are needed to broaden clarification on immigrants' health. For further explanation of the scope of the problem, a few definitions are necessary for clarification, as provided below.

Immigrant

The action by which a person, referred to as an immigrant or migrant, establishes his or her usual residence in the territory of a Member State for a period that is, or is expected to be, of at least 12 months, having previously been resident in another Member State or a third country, is known as immigration (7). While useful, one unintended consequence of such a generic definition is that migrants are often referred to as if they are one single group. However, there are many different groups covered by the term "migrant". In 2013, 28 percent of non-EU migrants to the EU came for family reunification; 23 percent for work; 20 percent for education; and 29 percent for other reasons (8).

- Voluntary immigrants: students, skilled people moving for work, spouses joining family members who already have settled. Finally, one often overlooked group is those who work in low-paid, often seasonal employment (8).

- Impelled immigrants: political (war, conflict, persecution), economic, environmental immigrants. Included are asylum seekers and refugees.

These different types of migrants, defined as one by their name, show a broad variety of financial and social statuses and all sort of different reasons to migrate. Therefore, it is important to specify when using the term “migrant” and only to use it with awareness.

Asylum seekers

An asylum seeker is a person who seeks safety from persecution or serious harm in a country other than his or her own and awaits a decision on the application for refugee status under relevant international and national instruments. In case of a negative decision, the person must leave the country and may be expelled, as may any non-national in an irregular or unlawful situation, unless permission to stay is provided on humanitarian or other related grounds (9).

Refugee

A refugee is a person who, "owing to a well-founded fear of persecution for reasons of race, religion, nationality, membership of a particular social group or political opinions, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country” (10).

Temporary Resident

A temporary resident is a foreign national granted the right to stay in a country for a certain length of time (e.g. with a visa or residency permit) without full citizenship. This may be for study, business, work or other reasons. Various EU countries have their own policies relating to temporary residency.

Permanent Residence

Permanent residency is a person's resident status in a country of which they are not citizens. This is usually for a permanent period. A person with such status is known as a permanent resident. These types of residents usually have almost all the same rights as people with a citizenship, including health care services.

1.1. “Healthy Migrant Effect” and Migrant’s Health

In the literature, migrants are often comparatively healthy, a phenomenon known as the “healthy migrant effect”. The health selection hypothesis suggests that immigrants tend to be different from those do not immigrate to the EU. Compared to the native population, immigrants may generally be better educated, less exposed to risk, more entrepreneurial and better prepared to confront stressful situations. Sick persons are less likely to emigrate (11). This phenomenon is found particularly in voluntary immigrants, such as students or highly skilled workers. On the contrary, other types of immigrants, such as immigrants arriving by illegal and unsafe routes, face particular health challenges and are vulnerable to a number of threats to their physical and mental health (12). Marginalized migrants, arriving from countries where health care systems are unstable, may have experienced traumatic situations on their way to EU countries (13). As a result, the “healthy immigrant effect” may not always be the case and migrants may present with poorer health than their native counterparts in the country they have moved to, especially when considering migration journey and its related trauma (8,14,15). Additionally, once arrived in an EU country, the precarious and uncertain situation may further deteriorate their health. In fact, studies have shown that migrants in EU countries seem to be more vulnerable to communicable diseases, as well as to occupational diseases, poor mental health, at higher risk of maternal and child health problems. This is in part due to patterns of disease in their countries of origin (13), but may be influenced by factors in their country of arrival. A WHO report in January 2019 stated that migrants and refugees in Europe tend to be in good general health, but they can be at risk of becoming sick during their travel through or while inhabiting in the country of arrival following poor living conditions (16).

Migrants may also come from countries in “epidemiological transition” (i.e., with an increasing prevalence of non-communicable chronic diseases such as diabetes and cardiovascular disease; mental health conditions such as depression; and lifestyle-related conditions such as obesity), while still dealing with infectious diseases, poor maternal and child health, tuberculosis, and HIV (17). Health care professionals in the country of migration must be able to consider such chronic diseases, as well as communicable diseases such as tuberculosis, hepatitis, parasitic diseases, and HIV (18). Migrants themselves are often unaware of the risk of chronic diseases in their new country of arrival and do not consider themselves as being at such risk, perhaps because many are younger (19). One clear need across different marginalized migrant groups is in relation

to mental health needs (20). A cohort study in Sweden, comprising 1.2 million native-born Swedes, 24,000 refugees, and 133,000 non-refugee migrants found that refugees were at increased risk of schizophrenia and other non-affective psychotic disorders compared to the other two groups (21). Reasons may include migration trajectory, racism, discrimination, and poverty (20,22,23)

1.2. Legal Protection of Immigrants' Health

Despite the different national regulations, European countries remain bound by international human rights commitments. One major policy is the International Covenant on Economic, Social and Cultural Rights (ESCR), which states in its 12th article “the right of everyone to the enjoyment of the highest attainable standard of physical and mental health” (24). This should be applicable to every human being, no matter the nationality: further interpreted by the ESCR Committee, which encourages countries to “respect the right to health by refraining from denying or limiting equal access for all persons, including prisoners or detainees, minorities, asylum seekers and illegal immigrants, to preventive, curative and palliative health service” (25). Another noteworthy mention is the “International Convention of the Protection of the Rights of All Migrants Workers and Members of Their Families”, a convention by the UN general assembly, that came into force in 2003. Its articles include the protection of human rights of migrants, their family members, migrant workers and also the rights of illegal and undocumented immigrants. In Article 28, the “Migrant workers and members of their families shall have the right to receive any medical care that is urgently required for the preservation of their life or the avoidance of irreparable harm to their health on the basis of equality of treatment with nationals of the State concerned” is stated. (26). Unfortunately, none of the EU member states has signed this convention. In practice, however, we can expect that these standards are not always met, and that there are inequalities in immigrant health in different EU countries (27). Immigrants often have a long procedure of struggle for permission to stay and a restriction of access to different national services. The EU countries' legal frameworks have set a maximum waiting time for asylum seekers until their case has been processed. In most countries, this theoretical maximum waiting time is set to 6 months (28). In practice, however, in many cases the waiting times substantially exceed this limit. For example, in Germany in 2011, the median time of an asylum seeker for his or her asylum application was 12.2 months (arithmetic mean) (29). Further, selected cases of asylum seekers in

Germany have been reported to have waited for several years until their application was processed. In other EU countries, asylum seekers struggle with similar situations as in Germany (29). These waiting times vault them into a state of uncertainty and instability that may impact immigrant's health.

There are many factors that could influence the health of immigrants. One of those factors could be the model of health care system of EU countries and immigrants' accessibility to health care services.

1.3. Immigration and Health Care

Definitions of the types of health care systems below intend to summarize clearly the organization of EU health systems.

1.3.1. The Beveridge Model

Health care is provided and financed by the government through tax payments. Many, but not all, hospitals and clinics are owned by the government. Some countries following the Beveridge model would be Great Britain, Spain and Scandinavian countries (30). Due to its fundamental principle on basing its costs on taxes, every citizen has access to health care services and is covered financially. It is usually cheaper for the state since the government decides on medical expenses. However, higher taxes are paid compared to the Bismarck model of health care, regardless of how much each citizen is in need of health. Centralized responsibility for quality care may be restrictive and therefore harmful to the individual patient. Waiting lists tend to be longer, for primary health care.

1.3.2. The Bismarck Model

Based on the Prussian Chancellor Otto von Bismarck, this, at least in theory, non-profit-based health care model is financially based jointly by employers and employees through payroll deduction. Every citizen is covered. It is a social type of HCS and does not aim to make a profit. It is found for example in Germany, France, Belgium, and the Netherlands. Advantages of the Bismarck model of health care may be shorter waiting times to receive primary care. Additionally, patients can choose which medication they would like to purchase. This keeps pharmaceutical companies in competition and drugs costs low. Studies show that inhabitants of countries with this type of health care model are generally more satisfied compared to the Beveridge health care model (31).

However, due to the focus on low costs and efficiency, health care services are often less available for rural citizens and there are often long waiting times for patients receiving secondary and tertiary services.

1.3.3. The Out-of-Pocket Model (OOP)

As included in the name, this model is based solely on a patient's finances. Consequently, wealthier citizens get treated while the rather poor have trouble receiving medical treatment. Fortunately, no European country completely relies on OOP models. Those who do, provide care as a combination of OOP and, e.g., tax-based and social health care, such as in Bulgaria, Greece and Lithuania (32).

It is not always clear what EU country can be assigned to what system, since no country in the EU follows either of the two systems in its pure form and the deviations among individual benefits can be significant. Over time, there are also some shifts towards the Beveridge or the Bismarck model, a clear system allocation is not always possible (30). Countries which have a high contribution of health care expenses based on out-of-pocket-payments have lower governmental expenses on health care. However, it can barely be called a "health care model, as it is not caring for any inhabitant. Sick people's cure is solely dependent on their own financial status. Consequently, socioeconomically poor inhabitants suffer the most. Ideally, the needs of migrants should be incorporated into all elements of health systems, including regulation, organization,

financing and planning. That way, non-discrimination and equal entitlement to health services is ensured. Specific steps to overcome barriers of migrants to health care typically involve measures to overcome linguistic, cultural and administrative barriers, such as interpretation and translation services; culturally informed models of care; culturally tailored public health programs; the use of cultural support staff (such as health mediators); training of staff in diversity; diversification of the workforce; and the involvement of migrants in all aspects of health care delivery (33). These steps may be decisive in immigrants' access to health care. However, in practice, these measurements are barely used. This may act as a barrier for immigrants to health care.

1.4. Immigrants' Access to Health care

With the recent wave of immigrants, the significantly different health needs of newly arrived immigrants from those of settled migrants has led to a new challenge. Europe's response to this situation has been far from ideal; although, most countries grant full access of health care to migrants with permanent residence (34), many aspects of health care access to immigrants with no permanent residence is restricted financially in most EU countries. Additionally, the specific health needs of migrants are poorly understood, communication between health care providers and migrant clients remains poor and health systems are not prepared to respond adequately (35). A lack of knowledge on the rights to health care access, long waiting times and inconvenient operating hours in primary care interfering with working hours of immigrants may also influence access to health care (36,37).

1.4.1. Financial aspect

Immigrants without a long-term permit of residence have to pay for their treatment beyond emergency care in most European countries (38). These financial restrictions may lead to a decrease in general health care expenses in this group of immigrants, since primary and secondary care and hospital services are connected to financial burden. A systematic review about comparing immigrants' health expenses to natives in the U.S. shows that immigrants, regardless of age group, immigration status or whether or not they are insured, are using only half to one-third of health care expenses as their native counterparts. Since U.S. immigrants are denied access to national

health care plans for the first five years of residence (39), these results can only be taken into consideration for EU immigrants without long-term residence permit. Resident immigrants are treated the same as the natives in most EU countries regarding national health care services (34), but most European countries have some sort of a co-payment scheme for the population, costs of medical attention are partly borne by the patients. Obviously, paying for social services has a greater impact on the most disadvantaged and poor sectors of the population, including many migrants. Countries such as France and Belgium provide exceptions for the poorest, but not everyone can qualify to benefit from these mechanisms (40). The result is those migrant groups may less likely go to the doctor (41).

1.4.2. Communication and Language

Another factor that may have an effect on immigrant's access to health care and therefore an effect on his health is the communication with medical staff. Complex administrative processes that are tedious and difficult to understand contribute to a lack of information and diminished health care system comprehension. Even after a few years of residence in the country of arrival, many migrants may have not learned the language to an extent that they are able to clearly understand clearly instructions for medical services or details surrounding medical services. This may lead to communication between doctors and migrants in which wrong or incomplete information is conveyed. Consequences may be either that there could be an increase in appointments due to delayed communication or increased time needed to understand each other, or that patients, insecure about their fluency of the language, may stay away from health care services completely. In countries, such as Denmark, the U.K., Portugal and many more, where health care is based on a gate-keeping system (the General Practitioner [GP] is the patient's obligatory first health care encounter), trust and communication may be easier to establish between immigrants and patients. In turn, the GP can be better prepared to communication (e.g., with a translator) with his or her patient and migrants may be guided by one trusted doctor rather than choosing between different specialists. Having to choose a doctor may lead to confusion in countries without the principle of gate-keeping GPs.

1.4.3. Lack of Information

Migrants themselves are often not aware of their entitlements and administrative officials and health professionals in the healthcare system often ignore applicable laws. Consequently, even if they are aware, fewer migrants attempt to access the healthcare system and many are wrongfully denied their rights to certain health care services (34). The perception that migrants have of the health care system they find themselves in is often another barrier. Work in Scotland with asylum seekers and refugees revealed that the majority of them came from countries in which health care was generally provided in the hospital setting, whilst primary care was not the dominant method of care (42). This led to a general doubt of the effectiveness of primary care to deal with their problems. In particular, there was a view that medical generalists such as GPs would not have the skills and knowledge to deal with all of the problems that they encounter (43).

1.5. Immigrants' Health Care Utilization

Health care access by immigrants may be different compared to the native inhabitants in EU countries. Barriers of immigrants' access to health care are health and socioeconomic status, self-perceived needs, health beliefs, health-seeking behavior, language barriers, cultural differences and trauma (12). Access to health care is difficult to measure directly and has most often been measured by utilization levels. In order to compare health care utilization, it is necessary to include the need for health care. According to a report of the European Observatory on Health Systems and Policies on Migration and health in the European Union, there are three measures of need to find out the level of health care access: 1) the utilization of preventive health care measurements (such as screening for breast cancer); 2) the utilization of rehabilitation services after disease; and 3) surveys collecting information on the prevalence of self-reported health, which are rare in literature. However, the results of these measurements depend on the general contact of immigrants with the health care system, including an initial likelihood diagnosis and, therefore these factors have to be taken into consideration (12).

1.5.1. Utilization of Emergency Care by Immigrants

There is a general tendency of studies towards an increased utilization of emergency care by immigrants. According to a systematic review from 2018, 13 out of 18 studies showed increased emergency department (ED) visits (1). Other explanations could be the aforementioned barriers to health care, such as financial burden, communication and language barriers, working hour interference and lack of understanding of the healthcare system that cause immigrants to go only to the ED with acute diseases.

1.5.2. Utilization of Primary Health Care by Immigrants

Primary health care is the first encounter to health care in most EU countries (44). Therefore, it should serve as the first health encounter for most registered immigrants as well, although studies have shown that there has been a shift in the utilization of health care by irregular immigrants from primary health care (PHC) to the ED in many European countries (36). And it may apply to registered immigrants as well. In general, there is a higher use of GPs by immigrants compared to natives, despite differences in country of origin, age and sex (12). For example, female immigrants in EU countries go to visit a GP more likely than male immigrants (12). Reasons for this are not clear. Maybe immigrants have an increased burden of disease compared to their native counterparts, but also it is possible that poor communication between a migrant and GP leads to repeated visits and additional diagnostic activities (12). Additionally, migrants generally register less often with general practices (45). On the contrary, having a GP may decrease the barrier to health care services (36).

1.5.3. Utilization of Hospital Care by Immigrants

Studies are inconclusive about the utilization of hospital care by immigrants. A systematic review from 2017, which included 39 articles about health care utilization by migrants, concluded that there are variations in both directions, increased and decreased utilization by immigrants, depending on the country and article.

1.6. Access of Registered Immigrants to Pay-Roll-Based Health Care

As there is insufficient research on how health care access by immigrants is modified by the Bismarck health care model, here we describe the health care system of France as an example. The French health care system is based on a social compulsory health care system. Possession of a residence permit is the key to access the French health care system for immigrants. Non-EU immigrants are only permitted free emergency care, although there are state finances for health services for undocumented immigrants who have applied for residency (46). Asylum seekers have a general permit to free health insurance while his/her application is being processed, and therefore, they can profit from free access to all health care services (47).

A similar situation can be found in Germany. The German health care system is also based on pay-roll taxes and ownership of a residence permit is the major entry to its health care system. Non-EU immigrants are only permitted free emergency care. In contrast to France, German asylum seekers do not have free access to all health insurance (48). Access to health care focuses on acute diseases and pain (49). Treatment for chronic diseases requires approval by the social security office of the receiving municipality paying for medical services. This is often criticized because chronic diseases such as diabetes mellitus type 2 can acutely deteriorate. In addition to that, German asylum seekers need to pick up a “Behandlungsschein”, an official document providing evidence of acute disease, by the responsible social service department each time before they can obtain any medical service (50). This may further complicate access to primary care and deteriorate immigrants’ health.

1.7. Access of Registered Immigrants Tax-Based Health Care

As there is scarcely available literature on how health care access by immigrants is modified by the Beveridge health care model, we can only describe the access to health care of different types of immigrants within an EU country given by the following examples. The UK, for example, provides health care through the National Health Service (NHS) which is based mostly on taxes. Emergency care and all types of primary care, including by a GP, are free for all of immigrants including refugees, asylum seekers, and temporary and permanent residents. Free access to secondary and in-patient hospital care only applies to people who are legal residents. Immigrants applying for a visa longer than 6 months have to pay a surcharge. Immigrants seeking asylum,

applying for indefinite leave to remain or who are under humanitarian protection are exempt from this charge (51). Generally, rapid access to health care can result in a cure and can avoid the spread of diseases; it is therefore in the interests of both migrants and the receiving country to ensure that the resident population is not unnecessarily exposed and put at risk of infectious diseases. Likewise, diagnosis and treatment of chronic diseases can prevent these conditions from worsening and becoming life-threatening (52).

Due to the lack of epidemiological investigations on the relationship between the perception of health and residential status in the EU according to health care system type, we aim to compare the self-perceived health between immigrants and natives in different EU countries within the context of the type of health care system.

2. OBJECTIVES

The objective of this study was to compare the self-perceived health between immigrants and natives in different EU countries within the context of the type of health care system and to look at the differences of health perception between the different models of health care system.

Hypothesis

We hypothesize that there is a generally worse health of migrants compared to the native population.

3. SUBJECTS AND METHODS

3.1. Data

We used 2011 European Union Survey of Income and Living Conditions (EU-SILC) population for individuals aged 16 years and older living in the EU-28 countries. We selected data from a population of residents who were native born, born outside of the EU, and not relocated from another EU country. We selected countries that participated in the EU-SILC survey, which had available data on country of birth, and age strata. Additionally, we selected countries with available 2011 Census maintained by the European Statistical System population data for the corresponding EU-SILC age strata (6;53). We excluded fourteen EU-countries that did not have enough data on non-EU born who were not current or former citizens of any EU country (Table 1). We included records that had available data on individuals' birth place, age, health status, and gender.

Table 1. EU countries excluded from our study

Country excluded from analysis	Reason for exclusion	Group(s)
Latvia	Missing all data on self-perceived health	All natives and immigrants
Hungary	Missing all data on self-perceived health	All natives and immigrants
Romania	Missing all data on self-perceived health	All immigrants
Slovakia		
Finland	Missing data on self-perceived health – good/very good	Female immigrants
Sweden		
Bulgaria	Missing data on all self-perceived health	All immigrants
Poland	Missing all data on self-perceived health	All immigrants
Malta	Missing data on self-perceived health +65 years	All immigrants
Luxembourg	Missing data on self-perceived health +65 years	All male immigrants
Denmark	Missing data on all self-perceived health	All immigrants
Ireland	Missing data on all self-perceived health	All immigrants
Czech	Missing data on all self-perceived health +45 years	All immigrants
Cyprus	Missing data on self-perceived health +65 years	All male immigrants

Regarding the type of health care system in the EU countries, we obtained data from the WHO European Observatory on Health Systems and Policies and grouped countries according to the type of health care system.

Data collected by Eurostat concern migration for a period of 12 months or longer: migrants therefore include people who have migrated for a period of one year or more as well as persons who have migrated on a permanent basis. Data on acquisitions of citizenship are collected by Eurostat under the provisions of Article 3.1. (d) of Regulation 862/2007, which states that: 'Member States shall supply to the Commission (Eurostat) statistics on the numbers of (. . .)

persons having their usual residence in the territory of the Member State and having acquired during the reference year the citizenship of the Member State.’

All refugees, resident in an EU country for at least 12 months were included in data from all included EU countries. Asylum seekers resident in EU country for at least 12 months were only included in data from Belgium, Germany, Estonia, Greece, Spain, France, Italy, Cyprus, Luxembourg, Netherlands, Austria, Portugal and United Kingdom and excluded in migrant data from all other EU countries Bulgaria, Czech Republic, Denmark, Ireland, Croatia, Latvia, Lithuania, Hungary, Malta, Poland, Romania, Slovenia, Slovakia, Finland, and Sweden (54).

3.2. Variables

Our outcome variable was general self-perceived health, where respondents answered „How is your health in general?“ on a Likert-type scale with responses of very bad, bad, fair, good, and very good. We collapsed these responses into a three-level outcome to assess the differences between immigrants and EU-born individuals in their responses of poor (bad, very bad), fair, and good (good, very good).

For the independent variables for the current study, we used the 1) birth place of individuals: non-EU 28 born (immigrant) or born in the country of residence (native born); 2) years of age; 3) gender; 4) countries of residence grouped by health system type: taxation-based type, mixed type of health care system, including combinations of social compulsory, out-of-pocket-based, voluntary and tax-based health care features, and social compulsory health care type.

3.3. Statistical Analysis

We reported data for the participants according to health system type, sex, age in years, and birth place (non-EU born or EU-born). We calculated the mean percentage of each response category rounded to the nearest tenth for natives and migrants according to health system type. We used the Chi-Square of Independence to assess differences in the mean percentages of immigrants or natives who perceived their health as poor/very poor, fair, or good/very good (response categories) according to health system type. After comparing the difference in the mean percentages and corresponding 95% confidence intervals (CIs) for the mean difference of self-perceived health between natives and migrants with the Chi-Square Test of Independence, we assessed the significance of self-perceived health between natives and migrants within the three groups of health care systems. We considered a $P < 0.05$ and non-overlapping 95% CIs to indicate statistical significance.

4. RESULTS

Table 2-4 show the sample sizes for participants in the different health systems who responded to the 2011 EU-SILC survey. Table 2 shows the total population of natives and of immigrants from countries that follow the social compulsory health care system.

Due to the lack of data, we could only include eight countries in the social health care system group (Belgium, Germany, France, Croatia, Netherlands, Estonia, and Slovenia), three countries in the mixed type of health care system (Greece, Lithuania, and Austria) and four countries in the group of tax-based health care system (Spain, Italy, Portugal, and the U.K.).

Table 2. Total number and age-specific number of natives and immigrants in countries with social compulsory health care systems

	Social compulsory health care system			
	Male		Female	
	Native	Immigrant	Native	Immigrant
<i>N</i>	101337604	9340799	117711348	7047929
Age				
16-44 years	54854835	3548287	61573926	3702929
45-64 years	30721616	4700019	3300350	2421245
65 years and over	15761153	1092493	23133916	923755

Table 3. Total number and age-specific number of natives and immigrants in countries with mixed types of health care systems

	Mixed type of health care system			
	Male		Female	
	Native	Immigrant	Native	Immigrant
<i>N</i>	14014440	1061312	15937425	1100295
Age				
16-44 years	6777179	663889	6724810	602430
45-64 years	4344153	314284	5169940	321989
65 years and over	2893108	83139	4042675	122624

Table 4. Total number and age-specific number of natives and immigrants in countries with tax-based health care systems

	Tax-based health care system			
	Male		Female	
	Native	Immigrant	Native	Immigrant
<i>N</i>	63829590	6286685	20623429	6320841
Age				
16-44 years	27271408	4185872	28262578	42793
45-64 years	22858895	1669253	1483836	14838
65 years and over	13699287	431560	19139593	557673

4.1. Natives compared to migrants in the social compulsory health care system

Comparing the difference in the mean percentages of female natives and immigrants living in countries with a social compulsory health care system, we observed that significantly more native women perceived their health as good/very good in all age groups, as shown in Table 4 ($P < 0.001$). Similar results are shown for males: more native men perceived their health as good/very good compared to immigrants, also in all age groups ($P < 0.001$). Additionally, we determined that more female immigrants below the age of 64 years perceive their health as poor ($P < 0.001$), while more native females above the age of 65 years perceive their health as fair compared to immigrant females over 65 years of age ($P < 0.001$). Regarding their male counterparts, more male immigrants of all age groups perceive their health as “fair” ($P < 0.001$). We did not find a significant difference between native and immigrant females aged 16-44 years who perceived their health as “bad” ($P = 0.470$). However, we found that significantly more immigrant females, aged more than 45 years and men of all age groups perceived their health as “bad/very bad” in countries with a social compulsory health care system ($P < 0.001$).

Table 5. Comparing self-perceived health between natives and migrants in the context of countries with Social compulsory health care.

	Social compulsory health care system					
	Females			Males		
	16-44	45-64	Over 65	16-44	45-64	Over 65
Good/very good						
Average % natives	83.4 (N=5370577)	58.1 (N=1903717)	31.5 (N=842947)	86.8 (N=5691402)	58.2 (N=1902223)	37.7 (N=688705)
Average % immigrants	77.1 (N=406610)	43.0 (N=163627)	26.4 (N=28832)	78.0 (N=390422)	50.6 (N=191940)	33.0 (N=55954)
95% CI*	6.2-6.4	14.9-15.4	4.6-5.6	8.7-9.0	7.3-7.8	4.3-5.2
<i>P</i> [†]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fair						
Average % natives	12.9 (N=907818)	29.1 (N=881881)	40.9 (N=1011382)	11.9 (N=815901)	27.9 (N=798493)	39.4 (N=671391)
Average % immigrants	19.2 (N=82803)	36.7 (N=115826)	37.0 (N=37571)	15.7 (N=64710)	32.1 (N=93423)	40.4 (N=55135)
95% CI	6.1-6.7	7.3-7.8	3.4-4.4	3.6-4.1	3.9-4.6	0.5-1.3
<i>P</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bad/very bad						
Average % natives	3.7 (N=237746)	12.7 (N=275918)	27.6 (N=417503)	3.9 (N=215560)	13.9 (N=296731)	18.6 (N=259266)
Average % immigrants	3.6 (N=11783)	20.3 (N=54357)	36.6 (N=31132)	6.3 (N=21632)	17.2 (N=44109)	26.7 (N=25302)
95% CI	(-0.2)-0.5	7.3-8.1	8.5-9.6	2.1-2.8	2.8-3.7	7.5-8.7
<i>P</i>	0.470	<0.001	<0.001	<0.001	<0.001	<0.001

* CI for the difference between the mean percentages of natives and immigrants

[†]Chi-square test of independence with a significance level set at less than 0.05

4.2. Natives compared to migrants in the mixed type of health care system

In the comparison of mean percentages of female natives and immigrants living in countries with a mixed type of health care system, we observed that until the age of 65 significantly more native females perceived their health as “good/very good” ($P < 0.001$), as shown in Table 5. On the other hand, more immigrant females rated their health as “good/very good” if they were aged over 65 years. Similar results are shown for males: more native men perceived their health as good/very good compared to immigrants; however, in all age groups ($P < 0.001$). Additionally, we observed that more female immigrants below the age of 64 perceive their health as “fair” ($P < 0.001$), while there was no significant difference between native and immigrant females above the age of 65 on “fair” health perception ($P < 0.001$). Significantly more native females aged 16-44 years perceived their health as “bad/very bad” ($P < 0.001$), on the contrary, more migrant females aged 45-64 perceived their health as “bad/very bad” ($P < 0.001$). In the age group of 16-44 years, significantly more native males perceived their health as “bad/very bad”, while more immigrant males perceived their health as “bad/very bad” if aged more than 45 years ($P < 0.001$).

Table 6. Comparing self-perceived health between natives and migrants in the context of countries with mixed type of health care.

	Mixed type of health care system					
	Females			Males		
	16-44	45-64	Over 65	16-44	45-64	Over 65
Good/very good						
Average % natives	86.4 (N=1044783)	57.2 (N=576827)	20.2 (N=178529)	86.3 (N=1003185)	58.7 (N=424078)	30.3 (N=210329)
Average % immigrants	73.1 (N=133859)	40.7 (N=45522)	21.8 (N=8300)	85.4 (N=154573)	54.1 (N=55104)	28.5 (N=8249)
95% CI*	13.0-13.5	16.0-17.0	0.8-2.6	0.8-1.2	4.2-5.0	0.8-2.8
<i>P</i> †	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fair						
Average % natives	11.4 (N=95835)	31.4 (N=217359)	40.2 (N=289932)	10.3 (N=80652)	30.1 (N=628840)	39.6 (N=189808)
Average % immigrants	19.6 (N=21335)	39.2 (N=31334)	40.2 (N=15302)	13.3 (N=17452)	31.6 (N=26110)	39.0 (N=9349)
95% CI	7.7-8.8	7.3-8.4	(-0.8)-0.8	2.4-3.5	0.9-2.1	(-0.4)-1.6
<i>P</i>	<0.001	<0.001	0.935	<0.001	<0.001	0.247
Bad/very bad						
Average % natives	12.4 (N=22302)	11.4 (N=78986)	36.7 (N=233018)	3.2 (N=31097)	11.1 (N=57332)	30.1 (N=134878)
Average % immigrants	7.2 (N=8237)	19.8 (N=18902)	37.9 (N=14341)	1.4 (N=2935)	14.2 (N=11173)	32.6 (N=7867)
95% CI	4.5-5.6	7.8-9.0	0.4-2.1	1.4-2.3	2.4-3.8	1.4-3.5
<i>P</i>	<0.001	<0.001	0.003	<0.001	<0.001	<0.001

* CI for the difference between the mean percentages of natives and immigrants

†Chi-square test of independence with a significance level set at less than 0.05

4.3. Natives compared to migrants in the tax-based health care system

As shown in Table 6, significantly more female immigrants perceived their health as “good/very good” until the age of 65 ($P < 0.001$) in countries with a tax-based health care system. On the other hand, more native females perceived their health as “good/very good” who were in the age group over 65 and over ($P < 0.001$). Significantly more male immigrants perceived their health as “good/very good” compared to male natives in all age groups ($P < 0.001$). More female migrants than female natives perceived their health as “fair” in age group 16-44 and age group 65 and over ($P < 0.001$), while more native females in age group 45-64 perceived their health as “fair” ($P < 0.001$). More male immigrants perceived their health as “fair” in age group 16-44 and 45-64 ($P < 0.001$), while more male natives in the age group 65 and over perceived their health as “fair” ($P < 0.001$). There were more native females in age groups 16-44 and 45-64 who perceived their health as “bad/very bad” ($P < 0.001$), while more migrant females perceived their health as “bad/very bad in the age group 65 and over ($P < 0.001$). In all age groups, native males perceived their health as “bad/very bad” compared to migrant males in countries with a tax-based health care system ($P < 0.001$).

Table 7. Comparing self-perceived health between natives and migrants in the context of countries with Tax-based health care.

	Tax-based health care system					
	Females			Males		
	16-44	45-64	Over 65	16-44	45-64	Over 65
Good/very good						
Average % natives	84.7 (N=5557509)	58.6 (N=3529763)	31.2 (N=1589420)	86.8 (N=5395733)	63.6 (N=3625519)	38.1 (N=1412302)
Average % immigrants	83.3 (N=842619)	68.0 (N=233742)	46.5 (N=58579)	88.0 (N=867323)	64.2 (N=264275)	47.0 (N=52734)
95% CI*	1.3-1.5	9.2-9.6	14.9-15.7	1.2-1.4	0.4-0.8	8.6-9.4
<i>P</i> †	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fair						
Average % natives	12.4 (N=675694)	29.4 (N=1352060)	37.2 (N=1626472)	10.1 (N=539724)	26.1 (N=1196136)	37.9 (N=1193813)
Average % immigrants	14.2 (N=112270)	24.4 (N=75390)	43.8 (N=48562)	10.5 (N=80183)	30.7 (N=95303)	30.6 (N=29080)
95% CI	1.6-2.0	4.7-5.3	6.2-7.1	0.2-0.6	4.4-5.0	6.8-7.9
<i>P</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bad						
Average % natives	3.0 (N=192686)	12.0 (N=531771)	31.4 (N=1219765)	3.2 (N=181231)	10.4 (N=468872)	23.9 (N=683514)
Average % immigrants	2.6 (N=23605)	7.6 (N=24490)	39.3 (N=70885)	1.5 (N=13430)	5.1 (N=19216)	22.5 (N=17263)
95% CI	0.2-0.6	4.1-4.8	7.5-8.3	1.5-1.9	4.9-5.6	0.8-2.1
<i>P</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

* CI for the difference between the mean percentages of natives and immigrants

†Chi-square test of independence with a significance level set at less than 0.05

4.4. Comparing health perceptions by health care system

Comparing confidence intervals of social compulsory health care system, mixed type of health care system and tax-based health care system (table 4-6), there was a significant difference in the good/very good health perception between natives and immigrants across all age groups and sexes. There was a significant difference in the fair health perception between natives and immigrants across all age groups and sexes comparing confidence intervals between the three groups of health care systems, except in females aged 45-64, males aged 16-44 and males aged 45-64. There was only a significant difference in the poor health perception between natives and immigrants between females of age group 16-44 and 65 and over.

5. DISCUSSION

5.1. Summary of our Results

In this cross-sectional study, we found that self-perceived health patterns between natives and immigrants varied widely across the different health care systems. In countries with a social and mixed type of health care system more natives perceive their health as “good/very good” while mostly more immigrants perceived their health as bad or very bad compared to their native counterparts. The opposite results we found in countries with a tax-based health care system: more immigrants perceived their health as “good/very good” and “fair”, while more natives perceived their health as “bad/very bad”, compared to their migrant counterpart. Therefore, we cannot assume a generally better or worse health between migrants and natives.

5.2. Interpretation

With the recent wave of migrants to EU countries, healthcare needs of migrants is increasingly being recognized (55). Immigration and its policy has been highly discussed the past few years. Therefore, the health of immigrants became a pressing factor too. In fact, migrants are among others the most disadvantaged population groups in EU countries (34). Looking at our results comparing the differences of self-perceived health between the different health care systems, we could assume that immigrants have tendency to a generally better health in countries with tax-based health care systems than in countries with a social or mixed type of health care system and that natives have a tendency towards a generally better health in countries with social compulsory health care system and countries with a mixed type of health care system. However, due to multiple limitations, we cannot make a direct link between countries with tax-based health care and better immigrant health based this cross-sectional study.

5.3. Similar studies

This is the first cross-sectional study comparing self-perceived health between natives and migrants in the context of type of health care system. There have been similar studies, such as a cross-country comparative study in 2014 by Malmusi et al (6). Malmusi and colleagues determined the association of self-perceived health of migrants and natives with various sociodemographic variables such as social class, education level, income level, etc., in the context of multicultural, assimilationist and exclusionist countries. He concluded that exclusionist countries were associated with larger socio-economic segregation and poorer health for migrants. However, there are no investigations comparing migrants' and natives' health perception by health care system type. This study is just the beginning of a broad, yet undiscovered research field and further studies, ideally a longitudinal study that will account for the influence of sociodemographic and lifestyle variables, besides the type of health care system, on health perception. Accordingly, future investigations are needed for a clearer picture of which factors influence self-perceived health between migrants and natives.

5.4. Limitations

Due to multiple limiting factors, we cannot establish a link between health care system types and immigrants' and natives' health. Confounding factors could be the country of origin, as well as the general health of the community of the migrant's home country could influence his or her health. Another influencing factor that could distort the link between self-perceived health and the health system could be the purpose of migration. A Canadian student will most likely be healthier than a once illegal migrant who fled from war, drought, and economical prosecution for months. The duration of migrants' journey and the extent of their struggle to his or her EU country of arrival, could also influence our results. Additionally, waiting times for asylum applications may influence our results; in Hungary, the mean waiting time for an asylum applicant is 6 months, while in Germany it is almost a year (29). Waiting time may be draining and could deteriorate migrants' health more the longer the process of application. Political integration policy has an effect on migrants' health; as shown in Malmusi's study, where 'exclusionist countries' in the EU were associated with larger socioeconomic segregation and poorer health of migrants (6). Other factors could be access to care, the aforementioned 'healthy migrant effect', natives' openness, fluency in

the host country language, and length of stay. Those factors should be included as variables in further studies, such as longitudinal studies, for further understanding the association in health differences between immigrants and natives in EU countries.

Another important limitation to our study is the variable use of different definitions used to describe migrants. In many studies mentioned, immigrants are not defined any further on how long they have been in that country and what kind of permit of residence they have. We only included immigrants who have stayed in the EU country for at least 1 year, since Eurostat only included those in their available data (including employee status, residence, not yet granted, and granted asylum). However, migrants are often not further classified and irregular immigrants, i.e., undocumented immigrants, may be included in their studies. Therefore, those studies may not be applicable to our study.

According to Eurostat's definition on their collection of data of immigrants, all EU countries included not only migrants with permanent residence but also refugees who have not gained permanent residence permit yet but who have lived in an EU country for at least 1 year. Additionally, some EU countries (Belgium, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Luxembourg, Netherlands, Austria, Portugal, United Kingdom, Norway, and Switzerland) have included asylum seekers living in an EU country for at least 1 year while others did not. (Bulgaria, Czech Republic, Denmark, Croatia, Latvia, Lithuania, Hungary, Malta, Poland, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland, and Liechtenstein). Due to data limitations, we excluded irregular, undocumented migrants and documented migrants residing in an EU country less than one year. We also did not include migrants migrating within EU countries.

Unfortunately, Eurostat only collects their data every 10 years. Therefore, the data we based our study on represents the immigration status as of 2011.

Researchers try to find out about immigrants' access to health care from the influence of many variables, which may be difficult to identify. It is therefore impossible to draw a conclusion about access or self-perceived health in different types of health care systems by immigrants and natives in EU countries without consideration of all the factors that influence this association. We can only observe and assess as many factors that may potentially influence their perception and systematically review the results. Moreover, follow-up of immigrants' self-perception on their health and within their health care system, frequency of health care use, and direct health-related

outcomes from medical records would provide a more comprehensive assessment of migrants' health in the context of an EU health care system. Unfortunately, such studies are still rare.

6. CONCLUSION

We conclude from our results that there was a tendency towards a migrants perceiving their health as good compared to natives in EU countries with a tax-based health care system compared to migrants in countries with a social compulsory health care system and tendency towards more natives perceiving their health as good compared to natives. However, results have to be taken with caution. In fact, no link can be made between health of immigrants and different models of health care systems, thus more studies are needed to extend the results of our study which will incorporate cofounding factors.

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8. SUMMARY

Objectives: To compare the self-perceived health between immigrants and natives in different EU countries within the context of the type of health care system.

Subjects and methods: We used EU-SILC data on self-perceived health of natives and immigrants, not born in the EU. Additionally, we selected data from the European Statistical System for population numbers on EU inhabitants and migrants who were born out-side of the EU and also grouped EU countries according to the type of health care system. We assessed between immigrants and EU-born individuals in their responses of bad/very bad, fair and good/very good according to their sex and age, within the type of health care system by comparing their mean percentages on health perception with Chi-Square of Independence.

Results: In countries with social compulsory health care, there were significantly more female and male natives of all age groups perceiving their health as good/very good, compared to their migrant counterpart. More female immigrants below the age of 64 perceive their health as poor, while more native females above the age of 65 perceive their health as fair compared to immigrant females over 65 years of age. Regarding their male counterparts, more male immigrants of all age groups perceive their health as fair.

We did not find a significant difference between native and immigrant females of age 16-44 who perceived their health as bad. However, we found that significantly more immigrant females, aged more than 45 and men of all age groups perceived their health as bad/very bad. In countries with the mixed type of health care system, more native females aged up to 64 years perceived their health as good/very good compared to their migrant counterpart, while more migrant females over the age of 65 perceived their health as good/very good. More native men in all age groups perceived their health as group as good/very good compared to migrant men of all age groups. In countries with tax-based health care, significantly more female immigrants perceived their health as good/very good in age group 16-44 and 45-64, while the opposite counted for females aged more than 65 years. More female migrants perceived their health as fair in age group 16-44 and females aged over 65 years, while more native females in the age group 45-64 perceived their health as fair. More male immigrants perceived their health as fair in age group 16-44 and 45-64, while more male natives in the age group 65 and over perceived their health as fair. There were more native females in age groups 16-44 and 45-64 who perceived their health as bad/very bad, while more migrant females perceived their health as “bad/very bad in the age group

65 and over. In all age groups native males perceived their health as bad/very bad compared to migrant males.

Conclusion: We conclude from our results that there was a tendency to migrants perceiving their health as better compared to natives in EU countries with a tax-based health care system. Additionally, we conclude that there was a tendency towards natives perceiving their health as better compared to migrants in countries with a social compulsory health care system and countries with a mixed type of health care system. However, results have to be taken with caution. In fact, no link can be made between health of immigrants and different models of health care systems, thus more studies are needed to extend the results of our study which will incorporate confounding factors.

9. CROATIAN SUMMARY

Naslov: Usporedba samoprocijenjenog zdravlja izbjeglica i domicilne populacije u različitim zemljama EU u kontekstu vrste sustava zdravstvene zaštite.

Ciljevi: Usporediti samoprocijenjeno zdravlje između migranata i domaćih ljudi u različitim državama Europske Unije unutar konteksta tipa zdravstvenoga sustava.

Materijali i metode: Koristili smo EU-SILC podatke o samoprocijenjivom zdravlju migranata i domaćih stanovnika koji nisu rođeni u Europskoj Uniji. Osim toga, izabrali smo podatke iz europskoga statističkoga sustava za stanovnike Europske Unije i migranata rođenih izvan Europske Unije te smo grupirali države Europske Unije prema tipu zdravstvenoga sustava. Između migranata i pojednaca rođenih u Europskoj Uniji odredili smo njihove odgovore na loše i/ili jako loše, nepristrane i dobre i/ili vrlo dobre ovisno o njihovom spolu i dobi unutar tipa zdravstvenoga sustava te usporedbom njihovih srednjih postotaka na percepciji zdravlja s Chi-Square nezavisnosti.

Rezultati: U državama s društvenom obvezom zdravstvenoga sustava značajno je više domaćih muškaraca i žena svih dobnih skupina koji su svoje zdravlje označili kao dobro i/ili vrlo dobro u usporedbi s migrantima. Više je ženskih migranata, mlađih od 64 godina, koje su svoje zdravlje označile kao loše dok su domaće žene iznad 65 godina označile svoje zdravlje kao nepristrano u usporedbi s ženskim migrantima. Što se tiče muških migranata, više je muškaraca koji su svoje zdravlje označili kao nepristrano. Nismo pronašli značajno razliku između domaćih stanovnika i imigranata u dobi između 16. - 44. godine koji su označili svoje zdravstveno stanje kao loše. Ipak, ustanovili smo da je mnogo više ženskih imigranata iznad 45 godina i muškaraca svih dobnih skupina koji su označili svoje zdravlje kao loše i/ili vrlo loše. U državama s miješanim tipom zdravstvenoga sustava više je domaćih žena do 64 godine koje su označile svoje zdravlje kao dobro i/ili vrlo dobro u usporedbi sa migrantima. Dok je više ženskih migrata iznad 65 godina koje su svoje zdravlje označile kao dobro i/ili vrlo dobro. Više je domaćih muškaraca svih dobnih skupina koji su svoje zdravlje označili kao dobro i/ili vrlo dobro u usporedbi s muškim migrantima svih dobnih skupina. U državama s zdravstvenim sustavom na temelju poreza značajno je više ženskih migranata koje su svoje zdravlje označile kao dobro i/ili vrlo dobro u dobi od 16. - 44. godine i 45. - 64. godine dok suprotno vrijedi za žene iznad 65 godina. Više je ženskih migranata koje su svoje zdravlje označile kao nepristrano u dobnoj skupini 16. - 44. godine te u dobnoj skupini preko 65 godina dok je više domaćih žena u dobnoj skupini 45. - 64. godine koje su označile svoje zdravlje

kao nepristrano. U dobnoj skupini 16. - 44. godine i u dobnoj skupini 45. - 64. godine više je muškaraca koji su svoje zdravlje označili kao nepristrano dok su domaći muškarci iznad 65 godina označili svoje zdravlje kao nepristrano. U dobnoj skupini 16. - 44. godine više je domaćih žena koje su svoje zdravlje označile kao loše i/ili vrlo loše dok su ženski migranti iznad 65 godina označile svoje zdravlje kao loše i/ili vrlo loše. Domaći muškarci svih dobnih skupina označili su svoje zdravlje kao loše i/ili vrlo loše u usporedbi s muškim migranti.

Zaključak: Iz provedenoga istraživanja i prikupljenih rezultata zaključujemo da migranti imaju tendenciju da svoje zdravlje označe kao dobro u usporedbi s domaćima unutar država Europske Unije sa zdravstvenim sustavom na temelju poreza. Osim toga, možemo zaključiti da postoji tendencija da domaći stanovnici naznače svoje zdravlje kao dobro u usporedbi s migrantima u državama s društvenim obaveznim zdravstvenim sustavom i u državama s miješanim tipom zdravstvenoga sustava. Rezultati se mogu uzeti u obzir, ali s velikom dozom opreza. Zapravo, nikakva veza se ne može napraviti između zdravlja migranata i različitih modela zdravstvenoga sustava tako da je potrebno mnogo više istraživanja da bi se produžili rezultati našega studija koji će sadržavati zajedničke čimbenike.

10. CURRICULUM VITAE

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