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Empirical Essays in Health Economics and Migration

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1 Introduction

The rising diversity in population of national states in Europe and all over the world creates new challenges for health care delivery systems, which need to constantly adapt and evolve in order to remain responsive to these new conditions. As migrants constitutes a significant and ever-growing share of European population, these challenges regard especially them.

Migration and health are at the heart of several strains of literature, tackling the issue from different perspectives. On migrant health, there seems to be consensus on the so-called ‘healthy migrant effect’, a phenomenon by which migrants are often in better health compared to natives of similar age (Giuntella, 2016). While this effect is evident and due to the fact that individuals self-selects into migration and those who leave their country represent a much healthier sample than population in the state of origin, it remains true that migrants are exposed to a number of threats to their physical and mental health. Specific needs of migrants are poorly understood by unprepared and untrained health care providers: communication, together with poverty of migrant clients, is one of the greatest barriers. Inadequate access to health care and unmet medical needs pile on the extent of problems migrants encounter in realizing their human capital, i.e., access to welfare and other basic services, constriction to low-paid and dangerous occupations, exposure to trafficking, smuggling and violence.

Both existing literature and evidence-informed policy-making lack coherent directions in research. One reason behind this is the paucity of data. First of all, there is a fundamental lack of clarity and consistency about who a migrant is. According to the UN Recommendations on Statistics of International Migration, a migrant is a “person who moves to a country other than that of his or her usual residence for a period of at least a year” (cited by Rechel, 2011). This is not a definition univocally shared by all countries, which makes it hard to compare data on migration from different states and to calculate how many migrants there are in every given country. Moreover, variations in definitions can negatively affect health system policies: legal status used to be the most significant and popular defining factor to determine access to care, but there is currently no international standard for a universally accepted definition of migrant (Hannigan et al., n.d.). When looking beyond the generation that initiated the migration journey, there is no consensus on the meaning of the term ‘second-generation migrant’. Moreover, another issue in existing research is the lack of high-quality data on health determinants, health conditions and utilization of health care services by migrants in EU countries. Where data on migrant health are available and reliable, they often give contradictory results due to the high diversity of the migrant population sample in terms of gender, age, ethnicity, nationality, country of destination, socioeconomic status and type of migration. Lastly, asylum seekers, refugees and undocumented migrants deserve a special focus. In the European context, rights of asylum seekers to minimum standard in emergency care, essential treatment of illness and necessary medications are established in the framework of the Council of the European Union. However, the provision of health care services to asylum seekers is still restricted in many EU countries and treatment beyond emergency care, such as primary care, is sometimes inaccessible to undocumented migrants or made conditional on certain pre-conditions, such as proof of identity or residence.

This patchwork of background complicates the picture and makes it difficult to replicate results of any geo-localised analysis. Also, many discrepancies in health status and use of health care disappear once controlling for socioeconomic status, thus implying that poor socioeconomic conditions may themselves be correlated with migrant status and that migration is a crucial social determinant of health because of its income effects (Rechel, 2011). The relationship between migration and health is extremely complex, since health of migrants is shaped by many factors embedded in the migration process, including ethnic identity, sociodemographic characteristics, and length of residence in the host country. The presence of so many levels and interactions between determining and confounding factors discourages any attempt to generalise results on migration and health and talk about the general level of health of migrant patients.

My contribution, outlined in two empirical case studies, focuses on how migrant utilization of health care services and health state are impacted by policies regulating access to the health system in host countries. Migrants' access to health services in European health systems is a crucial issue addressed by the existing literature on migration and health. Firstly, migrants make up a little although increasing proportion of the population in Europe (23.7 million were non-EU citizens, i.e. 5.3% of EU's total population; while 37.5 million people were born outside the EU, i.e. 8.4% of all EU inhabitants[1]), so health professionals, managers and policy makers need to know more about migrants' health, whether they actually have access to the care they need and whether adequate information is available to them to make informed decisions about their health. Secondly, illness can hamper integration processes in host countries as ill health affects the ability to engage in the new community's education, work and social life. This can lead to further marginalization and social isolation, which in turn can adversely affect health, contributing to a vicious cycle. The third

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[1] Source: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/promoting-our-european-way-life/statistics-migration-europe_en, last accessed December 2022.

argument is legal (as well as ethical) and is based on the notion of "the right to maximum attainable health". This right was described for the first time in the 1946 WHO Constitution and then reaffirmed in the 1978 Alma Ata Declaration and in the 1998 World Health Declaration. Furthermore, several international human rights documents recognize the right to health and call it upon state responsibility to ensure equal access to medical services for all individuals, regardless of origin, as a national priority. In this regard, and fourthly, for many European health systems, equity in access to health services is a key objective. Horizontal equity implies equal treatment for equal needs, while vertical equity implies different treatment for different needs (Rechel, 2011).

Access to health services can be described as the "fit" between patients and the health care system (Penchansky and Thomas, 1981), or, in other words, “providing the right services at the right time in the right place” (Rogers et al. 1999, cited in Rechel, 2011). Inequalities in access to care are present when there are systematic differences in access to needed medical services imputable to factors such as socioeconomic conditions or migrant status. Access is considered fair if it does not depend, for instance, on education, income, residence status, ethnicity or geographical distance, but exclusively on differences in health needs. However, access is often measured by utilization levels. Comparison of use of health care between different population groups requires a measurement of need for treatment. This is quite easy when comparing the use of preventive services such as population-based screening for breast cancer, when the need is defined nationally or sub-nationally according to age and gender (e.g., every woman in a certain age group is considered needy). Patient groups with a similar diagnosis are sometimes compared regarding their use of rehabilitation or preventive services. Another measure of need is achieved through surveys collecting information on the prevalence of self-reported poor health, chronic diseases or indications for treatment. These measures, however, are to some extent also an effect of contact with the healthcare system and longitudinal studies are therefore fundamental to infer on possible cause-effect relationships. Alternatively, surveys could directly try to investigate unmet needs by asking migrants on situations in which they have had health problems without contact the health system. Unfortunately, such surveys are quite rare and often lack validity and comparability across migrant groups and host countries (Rechel, 2011). The bulk of the literature on utilization patterns looks at a multitude of health services where migrant access to care might be significantly different than non-migrant, e.g., utilization of preventive services, general practitioners, emergency departments, hospitalization and specialist care. Other frequently used indicators for timely access to care are disease severity at diagnosis (indicating possible delays in patient referral and diagnosis at a later stage) and avoidable mortality. The use of health services by migrants often differs from that of native-born citizens, as both the needs of migrants and their access to healthcare are influenced by a number of factors related to the migration process, including health and socio-economic status, self-perceived needs, health beliefs, health pursuit behaviour, language barriers, cultural differences, trauma. This it is especially true for recently arrived migrants, as they are less informed about how to navigate the health system and may have urgent and special health needs. Furthermore, communications between doctors and patients can be more difficult in lack of a common language and cultural background, with the risk of leading to a sub-optimal diagnosis and treatment choice. In addition to investigating usage patterns, it is therefore important to measure access to care using other indicators, such as delays in diagnosis and treatment and care.

Factors related to health policies and the constitution and organization of health systems in migrant destination countries may constitute formal barriers to entry. These include legal and financial restrictions on the scope of rights to health services migrants are entitled to, like it is the case in most EU countries. In most countries, only emergency services are available to undocumented migrants, and some EU members states even restrict access to emergency care. Formal barriers can sometimes include special requirements for asylum seekers and undocumented migrants' referral to specialist care. User fees can be generally seen as a special type of formal barrier, as they generate inequalities in access due to migrants' lower socio-economic conditions, or as a specific barrier for some groups of migrants who are not yet eligible for subsidies during their initial residence time (Rechel, 2011). It is also important to acknowledge that the effective provision of health services may be more limited (or more extensive) than anticipated by formal legal rights, depending on specific circumstances. Furthermore, informal barriers hindering access to health care can arise from language or communication issues, socio-cultural factors and "newness" of the context, and the interaction between all of these factors. Language barriers include the lack of understandable information about patient rights, what services are available and difficulties in making appointments with doctors and follow-ups. Lack of qualified interpreters can lead to poor communication and difficult identification of health problems or even misdiagnosis. Lack of provision of qualified interpreters is partially to be imputed to lack of funds, but also to gaps in medical staff training for intercultural communication, whereby often doctors themselves prefer to benefit from ad hoc translation by family members and other carers of the patient. Although it may seem convenient, this creates many problems due to poor translation, psycho-social stress for family members due to the sensitivity of the topic, in particular for children, who are often used as interpreters in these situations. However, communication goes beyond language. A Dutch study proved that general practitioners communicate differently with migrants than with non-migrants: consultations with migrants were shorter, general practitioners more verbally dominant and migrants less demanding and vocal about their issues than non-migrants (Meeuwesen et al., 2006). In a health care system characterized by gatekeeping, poor communication with primary care physicians can also result in inappropriate referral to secondary care and nonadherence to treatment. Social exclusion and the loss of social networks, which often characterizes migration, can also represent barriers to seeking health care, such as it can institutional and personal discrimination and racism based on ethnicity or religion. Finally, being a recently arrived migrant first experiencing welfare and access to care regulations in the destination country could inhibit access to care, in particularly for those migrants who have not received any introduction to the host country health system (Rechel, 2011).

Another often neglected but extremely relevant aspect connected with access to health care concerns the repercussions that unequal access has on life satisfaction and self-perceived health of vulnerable migrants. The majority of existing literature links satisfaction with migrants' life and health status with the experience of migration (Nowok et al., 2013), the trauma experiences during the journey (Carswell et al., 2011; Amit & Riss, 2014), or socio-economic conditions of migrants compared with natives in the host country (Stranges et al., 2021). In my analysis, I make use of subjective indicators of well-being, along with dependent variables on the utilization of medical services both at the intensive and at the extensive margin, in order to give quantitative evidence of the relation existing between unrestricted use of health care and life satisfaction of migrants (Heizmann & Böhnke, 2019; Giovanis, 2022).

2 Content Literature Review

In the following section I will give an overview of relevant literature that informed my context and research question, namely research contributions analysing the health of migrants, their rates of utilization of health care and their disadvantage in comparison with native citizens in destination countries; relevant literature on the effects of migrant use of welfare and health care on the host society; and the impact that health and immigration policies have on migrant health and well-being.

2.1 Health Status and Use of Health Care by Migrants

Despite the pitfalls of generalization in terms of migrant health, relevant research in the field mostly agrees on the existence of significant differentials in health status and utilization of health care between migrants and natives and within migrant cohorts.

Several pieces of literature study potential predictors of inequality. Karlsen & Nazroo (2010) focus their analysis on religion and ethnicity as possible predictors of health patterns using data from the Health Survey of England (1999-2004) and present evidence outlining significant heterogeneity in health along ethnic and religious differences. In another piece of research making use of the same dataset, Norman et al. (2015) take into account socio-economic background as well as ethnic group of respondents. Their results show that socio-economic disadvantages are better predictors of variation in health outcomes across ethnic groups than ethnicity itself, and this pattern holds regardless of future general improvement in population health. Together with socio-economic conditions, another factor that may significantly affect health patterns is migration history, immigration regulations and experience in the destination country: evidence on physical and mental health outcomes suggest that there is overall a penalty for migrants, and that the magnitude of their disadvantage in access and use of health care varies depending on time spent in the host country (Jayaweera, n.d.).

Other studies outline differentials existing between migration histories, namely economic migrants and asylum seekers and refugees (AS&R). Biddle et al. (2019) monitor AS&R health along a series of indicators, including health limitations, health state, pain, chronic illness, depression and anxiety, as well as utilization of primary and specialist care. Findings shed light on poor levels of health, especially among females and older respondents, and unmet needs regarding both primary and secondary treatment. Direct migration background if often associated with lower health care services take-up compared to natives, lower rates of hospitalization, and increased likelihood of self-reporting poor health (Steventon & Bardsley, 2011; Wadsworth, 2013; Grochtdreis et al., 2021). Unsurprisingly, since migrants are less likely than natives to get regular access to preventive, primary and secondary care, they are more likely to contact emergency services and to receive in- and out-patient emergency treatment (Devillanova & Frattini, 2016): these findings hold significant for second-generation migrants as well, confirming the impact of ethnicity and socio-demographic background on health decisions. Devillanova (2008) examines the effects of information networks on migrants' access to health care services. The dataset consists of an unusually large sample of undocumented immigrants and contains a direct indicator of information networks, i.e., whether the migrant was referred to health care take-up opportunities by a strong social tie. Focusing on time spent in the destination country (Italy) before receiving any medical assistance, findings show how relying on either a relative or a close friend significantly reduces time before first visit by 30%. Information networks, in the form of benefit from the support of a close community can thus build the bridge between the patient and the foreign health care system and positively affect migrant utilization of health care and, possibly, health outcomes. Kuehne et al. (2015) focus on subjective experiences of illness and health and the impact of illegality on migrants' health and access to health care by means of an empirical analysis on health status of undocumented migrants in Germany with a mixed method approach including complementary qualitative and quantitative datasets. The health outcome used in their approach consists of standardized version of health-related quality of life (HRQOL), analysed in comparison to the U.S. American sample and a representative German sample. Their results show how living without legal status has a significant negative impact on health and well-being and may further exacerbate physical and mental illness. Possibilities to claim basic rights and protection as well as access to care without legal status appear to be important predictors of health and well-being. Another study which uses HRQOL as health indicator is the work of Grochtdreis et al. (2022), who provide evidence that, while mental scores on HRQOL for asylum seekers and refugees are lower than the native counterpart, physical scores are significantly higher. These results support the concept, developed in health and migration literature, of the existence of a ‘healthy migrant effect’.

There are several pieces of empirical research dealing with estimation of the healthy migrant effect. Constant et al. (2018) compare Israel and 16 European countries with fundamentally different migration policies and provide evidence of the existence of a health advantage over comparable natives for migrants moving to Europe, where entry policies are far more restrictive than Israel's: this advantage remain consistent and significant over many years. The work of Giuntella (2016) confirms the existence of a 'health migrant effect' also concerning individuals with indirect migration background. He examines the birth weight of second and third-generation Hispanics born in California and Florida to investigate the generational decline in the birth outcomes of Hispanics in the US: he shows that second-generation Mexican and Cuban children have better birth outcomes than children of US-born white women and such advantage is still present for up to the third generation of migrants of Mexican origin. Holz (2022) compares physical and mental health outcomes of different migrant groups and the native population in Germany and observes a significant health advantage for both European and Non-European migrants compared to the host population, which declines in time. The healthy migrant effect is rooted in evidence that migrants arriving in the destination country are, on average, healthier than comparable natives. However, this initial advantage apparently erodes and disappear quickly as migrants adapt and integrate in the host country. This effect is explained by the positive self-selection that occurs in countries of origin, where only healthier immigrants decide to leave (or manage to leave and reach their destination, in the case of forced migration and displacement) as well as the positive selection, screening and discrimination happening in the host nations (Constant et al., 2018). Given the dual nature of this effect, the healthy migrant effect has often been referred to in the literature as the 'healthy migrant paradox' (Giuntella, 2016), and there is a special focus in research on the heterogeneity in migrant health due to this 'unhealthy assimilation' to health patterns of natives in destination countries (Giuntella & Stella, 2017).

Not all areas of health receive the same attention in literature with regards to migrant health. In particular, there are some health issues where empirical analysis tends to focus on, as they represent sensitive health issues for migrants, due to either particularly poor outcomes or significant gaps in access to adequate treatment. According to Rechel, 2011, migrants are majorly penalized in outcomes concerning communicable and non-communicable diseases, maternal and child health, occupational health and mental health. A report by the Koch-Institut (n.d.) highlights concern also on chronic diseases, often left untreated or without proper care follow-up. In a country like Germany, where migrants without residence permit are not covered by health insurance and are de facto excluded from access to health care, exceptions of covered treatment are cases of communicable diseases, e.g., sexually transmitted infections and tuberculosis, and vaccinations as well. In their study, Mylius & Frewer (2015) highlights the gap between legislation and reality of hindered access to medical treatment required by undocumented migrants.

Maternity and child health is a thoroughly studied topic in research on migrant health, with mixed results (Higginbottom et al., 2019; Frank et al., 2021). Contrary to findings which outlined a lack of priority placed by migrants on antenatal and perinatal care as crucial determinant for poor maternal health outcomes, Phillimore (2016) points out a series of structural, legal and institutional obstacles obstructing timely and effective access to mother and childcare for migrant women. Jayaweera & Quigley (2010) investigate the relation between ethnicity and several indicators for health status, behaviour and health use for mothers born outside of the UK using data from the Millennium Cohort Study. Once adjusted for country of birth, length of residence and main socio-demographic characteristics, ethnicity retains significance as predictors of most health indicators. Also, their findings detect a linear trend in decreasing health status with increasing length of stay in the UK, but no independent association between years of residence in the host country and utilization of health care. This suggests that, in a context of existing barriers to use of health for migrants, factors important in predicting one outcome may not be relevant for another: Jayaweera and Quigley point out how improving socio-economic circumstances for mothers of some ethnicities does not necessarily associate with better outcomes in health nor positive changes in health behaviour.

Lastly, on the topic of mental health conditions of migrants, findings of Walther, Kröger, et al. (n.d.) show that refugees are especially at risk for mental health distress and provide insight on the significant correlation between mental health and integration processes including labour market participation, educational program and integration courses. Walther, Fuchs, et al. (n.d.) focus on how the length and uncertainty implicit in the asylum process, as well as forced separation from family, correlates with higher levels of mental distress and lower levels of life satisfaction for asylum seekers and refugees. Other significant factors which negatively impact mental health are lack of employment, living in communal rather than private housing, isolation from the host society and poor host country language skills.

2.2 Migrant Health and Host Societies

Recently, research dealing with migrant health has been focusing on an additional aspect: the impact of migrant access to health care on the host society, either in terms of native health or expenditure in health care systems. The major goal is to try and identify the 'cost' that migrant health exerts on destination countries' welfare systems. Bozorgmehr & Razum (2015) use annual, nation-wide, aggregate data of the German Federal Statistics Office (1994-2013) and a policy reform concerning length of time from arrival during which access to care for asylum seekers and refugees in Germany is restricted. They compare health expenditures among asylum seekers with restricted access (exposed) to asylum seekers with regular access (unexposed) and conclude that the cost of excluding them from health care appears ultimately higher than granting regular access from the very beginning of their stay in Germany. Excess expenditures stemming from restrictions in place appear substantial and not fully explainable by differences in needs between groups of refugees. Despite evidence, restrictions in access to care services are frequently claimed to be necessary to prevent unduly high health service utilization and costs. Another paper on the German case study, by Gottlieb et al. (2022), use a variation in policy regulating access to care prompted by Berlin's decision to remove barriers from asylum seekers. They compare costs for out- and in-patient health services for asylum seekers before and after restrictions have been relaxed and provide evidence that average per person expenses for out-patient treatment decline, whereas utilization and costs for in-patient care rise.

Another area where migrant health can have significant impact is on the health of natives. Using data from the UK Labour Force Survey (2003-2013), Giuntella et al. (2019) find evidence on how immigration leads to a reallocation of work-related risk, prompting native-born workers to shift to jobs characterised by lower physical burden and injury risk. Together with evidence that migrants tend to report lower injury rates than natives and that immigration is positively correlated with improvements in self-reported measures of native workers' health, these results suggest that reallocation of work due to immigration could reduce overall health care costs as well as the human and social cost due to work injuries. Another paper focusing on this aspect of migration in another context is given by Alacevich & Nicodemo (2019): they exploit geographical and temporal variation in net migrant inflows across Italian provinces and show the existence of a significant gap between migrants and natives in work-related accidents, possibly due to migrants sorting themselves into positions with a higher injury risk and alleviating the exposure of Italian workers. Immigration can affect the health of natives through other mechanisms: in particular, one concern in public discourse against immigration has often been on how increasing numbers of population can put unsustainable pressure on state-funded health systems. However, research shows that this concern is not backed up by evidence. Giuntella, Nicodemo et al. (2015) analyse the effects of immigration on waiting times for NHS services in England and find that migration actually reduces waiting times for out-patient referrals. This could be due to the fact that immigration increases natives' internal mobility and immigrants tend to be relatively healthier than natives.

Another strand of research deals with the impact that migration has on life satisfaction and self-reported health of natives. Akay et al. (2014) use data from the German Socio-Economic Panel for 1998-2009 merged with local labour market information to investigate how spatial concentration of migrants affects life satisfaction of native Germans. The results point in the direction of a positive effect of immigration on native health, not imputable by local labour market characteristics. On the other side, immigration has only a weak impact on the well-being of immigrant groups living in areas where migrants concentrate. A similar positive effect of immigration on well-being and health of natives has been detected by Giuntella & Mazzonna (2015). They find that migrants are indeed healthier than comparable natives upon their arrival in the host country (consistent with the healthy migrant effect), but their health rapidly deteriorates over time. At the same time, because of migrants concentrating in more physically demanding jobs, immigration does reduce the likelihood of natives being in strenuous occupations and consequently their likelihood to report negative health outcomes by improving natives' work conditions and workloads.

2.3 Effects of Welfare and Health Policies

Studies from across EU states show significant health inequalities between migrants and native citizens. While some types of migrants, such as asylum seekers and irregular migrants, mostly face restrictions in their fundamental rights to health care, EU countries guarantee full equal treatment to "third-country nationals" (non-EU citizens) who have obtained the status of long-term resident, granting them equal status as residents of other EU countries. However, there is growing recognition that migrants face specific barriers in accessing health services that go beyond legal restrictions, such as lack of information, cultural and linguistic barriers and socio-economic deprivation. Moreover, the design of policies defining the scope of access to health care migrants are entitled to brings about ethical, moral and political issues. In particular, the link between health policy and immigration policy borders sometimes on unethical grounds, as equal access to health is a universally recognized human right and embedded in the constitution of most EU countries and should be thus unconditional of country of origin and only dependent on individual health needs (Taylor, 2009).

Design and evaluation of policies regulating migrant access to care and welfare is a highly discussed topic in public discourse and scientific literature. Several pieces of empirical research discuss the extent over which insurance-like coverage affects migrant health on a wide range of indicators, e.g., health care utilization, disease treatment and outcomes, self-reported health, and mortality. Among the many, Sommers et al. (2018) analyse the impact of losing insurance coverage by replacement of the Affordable Care Act[2] (ACA) on health and mortality of migrants. They provide a comprehensive and detailed review of high-quality studies on the US case study which focus on effects of coverage for non-elderly adults, either experimental or quasi-experimental. Their contribution also highlights the many complex aspects of any assessment of insurance coverage on health, e.g. health effects appearing only on the long run and thus being hard to observe and evaluate in the short-run, heterogeneity in effects due to variation in insurance benefit design, presence of confounding factors since changes in insurance benefit often correlate with other circumstances potentially affecting health. In Spain, Juanmarti Mestres et al. (2021) look at participation in public welfare programs for undocumented migrants and estimate the effects of restricting access to health care on migrant mortality rates. Their results show how, during the first

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[2] Formally known as the Patient Protection and Affordable Care Act and colloquially known as Obamacare, enacted by the 111th United States Congress and signed into law by President Barack Obama on March 23, 2010.

three years since implementation of the restrictions, the monthly mortality rate of undocumented migrants increased significantly by 0.31 deaths per 100,000 individuals, and only a very marginal percentage of this variation can be explained by selective migration. Their results thus confirm the significant effects of health insurance coverage of health of vulnerable individuals and hold important policy implications for developed countries receiving sizeable shares of migrants.

2.4 This Paper's Contribution

In my dissertation I focus on two case studies, both concerning access to health care for migrants: a change in NHS system of charges affecting temporary migrants in the UK, and the introduction of an alternative administrative mechanism for access to health care for asylum seekers in Germany. In the UK, the government launched in 2014 the 'NHS Visitor and Migrant Cost Recovery Programme Implementation Plan' with the aim of recovering costs of care from "chargeable" patients, i.e., non-UK born individuals who are not ordinarily residents in the UK and do not contribute regularly to welfare expenses. In Germany, asylum seekers and refugees are not covered by state health insurance for the first months of their stay and receive medical treatment through the issue of a 'health voucher'. With the voucher, access to care must first be authorized by a non-medical officer issuing a voucher for the corresponding needed service: in some states, an alternative mechanism has been proposed and implemented, i.e., the electronic health insurance card (eHIC), which eliminates non-medical intermediation between patients and physicians. In both cases, the underlying issue concerns implications and consequences of restricting unlimited welfare and care rights to citizens, whereby vulnerable migrants become excluded from immediate access and the scope of their entitlements become entangled with either their immigration status or their randomly-assigned location of first residence in the country. Both legislative changes have been so far neglected in the literature: the scarce availability of national datasets linking data on migration background and health of respondents, the added difficulty in recovering such data especially for undocumented migrants and asylum seekers during the first months since arrival in the destination country, the lack of importance placed in the public debate on adequate provision of health care for non-citizens contribute to the paucity of studies dedicated to either one of this contexts.

In both cases, my strategy has been based on the following two main components: the use of panel-like data and the application of quantitative methods for estimation, an approach that is more an exception than the rule in existing empirical studies on the health of migrants. I have made use of longitudinal, nationally-representative survey data for Germany and the UK, both including pieces of information on respondents' origins and migration history if applicable, and on individuals' health behaviours and conditions throughout the interview years. Both surveys, i.e., Understanding Society for the UK and SOEP for Germany, started to include boost samples with regard to ethnic minorities, immigrants and foreigners. Also, several sections of both surveys are dedicated to individuals' well-being, satisfaction with life and health, general health behaviours, familiarity with and frequency of access to the country of residence's health care system. This made it possible for me to link the two components and identify groups of migrants ad asylum seekers, and gather data on their health and use of care services.

The change in legislation concerning the health of migrants in the UK has sparked some debate and gathered attention in academic research, mainly on the immediate and expected consequences of such interventions on migrants' use of care. Keith & Van Ginneken (2015) argue that the reform of NHS challenges migrants' right to life as it results in limited access to medical care. Fox & Hiam (2018) provide a qualitative analysis of the impact of the policy change on vulnerable migrants and health care staff using case studies from the Doctors of the World clinic. Another qualitative community-based study is the one by Kang et al. (2019), where the authors examine experiences of asylum seekers and refugees accessing primary health care in the UK in 2018 and found participants found primary care services difficult to navigate and negotiate. Among the obstacles mentioned, there are language barriers and inadequate interpretation services, lack of awareness about the structure and function of the NHS, difficulty meeting the costs of care and prescription fees, and the perception of discrimination relating to race, religion, and immigration status. There is also quantitative analysis on the subject: Potter et al. (2020) examine the impact of the NHS cost recovery programme on diagnoses of tuberculosis (TB) cases among migrants in the UK and in particular on rates of diagnostic delay. Making use of logistic regression in a multivariate model to test the association, they found that, since the implementation of the NHS reform, there has been a significant delay for TB treatment among non-UK born patients, potentially exposing them to increased risk of morbidity, mortality and transmission of the disease in the community. Dobbin et al. (2022) explore instead the relationship between sex, age, nationality, ethnicity, urgency and the cost of healthcare, among overseas visitor charges in non-specialist NHS trusts in England. Since the NHS reform, which states that temporary migrants from outside the European Economic Area (EEA) are chargeable for NHS care at 150% of cost, evidence shows that women (particularly undocumented) are disproportionately impacted by the NHS charging policies in England. The majority of the studies remain limited to very restricted and local cases, e.g., a small number of trusts or clinics in just one area or region, and they resort to mixed methodologies. There is a prevalence of studies involving guided or semi-guided interviews to a random sample of patients, where questions are mainly centred around their experience in getting access to services and being treated in an adequate manner. Few studies use objective indicators of health, and they are more often related to morbidity and mortality patterns than actual access to care when needed. I believe my approach adds value to the research by combining both subjective indicators of well-being and health status and objective values of incidence and frequency of successful access to care.

In the German context, I examine the impact of restrictions in access to care for asylum seekers and refugees. Federal law defines asylum seekers’ scope of health entitlements as restricted to emergency care and access to primary and secondary care that is not urgent is administered at local level through different mechanisms. At the present moment, depending on the state, district or municipality where individuals have been deployed at point of arrival, they either access care through the health voucher or the electronic health insurance card. The health voucher is released by public welfare officers to individuals who request access to care, it has validity limited in time and usually first grants access to primary care: should the GP refer the patient to secondary care, an additional specific voucher is required. The card represents an alternative to this process as it leaves non-medical personnel out of the decision process: asylum seekers can thus access the health care system the same way German citizens do, at moment of need, and the only difference lies in which entity is responsible for paying medical bills. Decentralization of welfare decisions in Germany, together with the existence of a parallel regulatory system for refugee health needs, create the conditions for fragmentation and internal variation of health policies, as some states, districts and municipalities in Germany have decided to adopt the eHIC as main delivery mechanism, whereas others have rejected the proposal and stuck to the voucher (Gottlieb & Schülle, 2021a). This picture is particularly appealing for experimental and quasi-experimental research focusing on the effects of restrictions on health of migrants. Claassen & Jäger (2018) examine this impact on the use of health care services by asylum seekers, proxied by their consultation rate of ambulant physicians. As evidence shows that asylum seekers in possession of eHIC are significantly more likely to seek ambulant health care that those receiving vouchers, their conclusion suggest that having to ask for the issue of vouchers at the social security office could be a relevant barrier for patients in need. Taking this research one step further, they also address the question on whether easing restrictions for accessing medical care leads to overuse of the health care system. Focusing on in-patient care and out-patient primary and specialist care, they found that asylum seekers with eHIC are less likely to visit their primary care practitioner and secondary care specialists that comparable German citizens. This difference in utilization of out-patient care is partially compensated by a more frequent use of in-patient care. They reach the conclusion that there is no significant indication that the introduction of eHIC has brought about an overuse of health care services (Jäger et al., 2019a). Still exploring the differences in health status and use of health care between those who benefit from eHIC and those who use the voucher, Müllerschön et al. (2019) look at diagnosed cases of HIV in Germany in 2015, most of those are uninsured migrants from sub-Saharan Africa. Their analysis assesses whether migrant access to care in the form of HIV testing services depends on their health insurance status to inform prevention strategies. Overall, they observe that participants without health insurance reported less frequently visiting physicians or hospitals and were less likely to undergo a HIV test. In general, having no health insurance either by the card or the voucher decreased the odds of contact with medical professionals more than other socio-demographic characteristics. Wenner et al. (2020) assess instead differences in realized access to a range of health care services between asylum seekers with the card and with the voucher in North Rhine-Westphalia, where both access models have been implemented across the 396 municipalities. As refugees are quasi-randomly assigned to municipalities, they are able to realize a natural quasi-experiment including asylum seekers from six municipalities (three for each model) in 2016 and 2017 and comparing the standardized incidence rates (SIR) of specialist services use, emergency services use, and hospitalization. The results suggest that the eHIC is slightly better able to provide refugees with access to specialist services and goes along with lower utilization of emergency services compared to the voucher, whereas no advantage of one model over the other has been found with respect to hospitalizations rates. My research also exploits the scattered introduction of the card across German states and the possibility to compare the trajectories of health for individuals in states where the card becomes the practice and in states which stick to the voucher. In terms of outcomes, the main focus of my paper is on the health of asylum seekers rather than on the pressure experienced by care workers and medical system. Together with indicators of utilization of health care both at the extensive and intensive margin, I include self-reported determinants of health, satisfaction with health and worry about health.

3 Methodological Issues regarding Research on Migration and Health

In the following paragraphs I will first explore the main present issues related to collecting migrant information on health and use of health and to use them in empirical impact evaluation. Then I will proceed to give an overview of the main methodologies used in migration and health analysis, highlighting the pitfalls and shortcuts of used methods and recent advances.

3.1 Data Collection on Migrant Health

Accurate data on migrant health is an essential precondition for conducting any reality-based empirical analysis. Yet most European countries lack accessible and accurate health information of migrants, and this constitutes a challenge for research as it limits the possibilities to monitor and improve the health of migrants and to conduct comparative studies on inequalities in access to health care (Rechel, 2011). There are a number of reasons for this, including the lack of any system for the systematic collection of data on the health of migrants. In contrast with the situation in Australia, Canada, New Zealand and the United States, countries in Europe do not systematically collect health data based on migrant status. Also, census practices are very different between individual countries: European states generally do not include variables on the status of migration in health information systems or surveys. While the Netherlands and the UK for instance have significant experience in carrying out population-based surveys that also contain information on migration status or ethnicity, countries such as Belgium, Germany and Spain they have only recently begun to include such variables in health surveys. Moreover, even in those countries that collect routine health data by migrant status, information on particularly vulnerable groups of migrants, such as asylum seekers or undocumented migrants, is generally lacking. Another challenge is that there are multiple definitions or interpretations of who constitutes a migrant – and how many migrants there are in a given country - as many as there are countries that welcome and register migrants (Rechel, 2011). The different categorizations and definitions of migrants, and the degree of acceptance regarding the collection of "ethnic" data, mainly reflect different contexts, statistical practices, administrative and political structures, welfare regimes and immigration histories (Mladovsky, 2009). For some countries, ethnicity is a key criterion for describing groups within a population, while others even refuse to use the concept. In the UK, immigrant communities who settled in the country through migration from former colonies after World War II are defined as "Black and Minority Ethnic" (BME) groups, rather than migrants, while asylum seekers and refugees do not fall into this category. In the Netherlands, information on the place of birth of individuals and that of their parents is collected and those with at least one parent born outside the Netherlands are classified as “allochtonen”, i.e., of foreign origin (Ingleby, 2006). Many countries are reluctant to collect "ethnic" data; this is sometimes due to ideological and ethical issues and sometimes due to concerns about privacy and the protection of sensitive information (Simon, 2007). In Sweden and many countries in Eastern Europe, attention to "ethnicity" is currently considered both unnecessary and undesirable (Ingleby, 2009) and the collection of data classifying the ethnic origin of individuals is prohibited. In France, in line with the republican ideology that "all citizens are equal", routine data collection systems such as the national census have always been reference only nationality and country of birth and do not ask about ethnicity or religion. However, the debate has received new impetus through the introduction of anti-discrimination policies and measures promoting diversity in companies (Ingleby, 2009). In Germany, information on the origin of migrants is lacking in most data sources, although some contain information on nationality. The country is still wary of collecting ethnic data, as it would conjure up memories of the categorization of individuals who preceded the Holocaust and gave rise to fears that such data could be misused to incite racism and discrimination (Simon, 2007). Altogether, much historical research on race and ethnicity in Europe (and elsewhere) has generated racist and immoral policies. Yet, without information on migration status it is challenging to monitor and improve the health of migrants and to fight against discrimination.

A major conceptual problem is the lack of a universally accepted definition of what constitutes a migrant. Despite several calls and attempts to establish common definitions to classify migration movements by the United Nations and EU bodies, data collection is still guided by national legislative, administrative and political needs and follows national definitions and classifications (Ingleby, 2000). Countries define migrants in many different ways, e.g. by country of birth, nationality, residence and, less frequently, length of stay in the host country. This makes it very difficult to measure international migration, not to mention monitoring the health of migrants or comparing the health of migrants in different countries of destination. All the different definitions of migrant status have their limits (Rechel, 2011). Nationality, ethnicity, citizenship and country of birth, for example, disregard the year of arrival. Citizenship also does not take into account naturalized migrants, so that country of birth appears to be a better indicator of migration status (Borjas, 1996). Country of birth can be used as an indicator by migrant origin or ethnicity, but it must be supplemented with additional indicators (Stronks et al., 2009). In some countries, it is even complicated to account for children born to European parents in what were then colonies in Africa or Asia. Another problem is that commonly used definitions of migrant status do not distinguish between the many sub-categories of migrants, such as asylum seekers, irregular migrants, trafficked persons, regular migrants and students. In migrant health research, this represents a problem because these groups have specific health care needs and may be faced with particular legal requirements or other barriers to accessing health services (Rechel, 2011). Another unanswered question in migrant health research is which groups migrants should be compared against: would it be host population, other migrant groups or population from country of origin? The latter comparison has so far hardly been addressed by research, but it can provide particularly valuable insights into how migration has impacted those who have moved from one country to another. Heterogeneity and relatively small size of some migrant communities are also a factor. As oversampling is often required in clinical studies in order to provide statistically relevant information on smaller subgroups of the population, and since researchers tend to come from the dominant ethnicity, or native population, official medical research has long favoured homogeneous samples, excluding migrants and ethnic minorities from clinical evidence (Ingleby, 2006), although there are exceptions such as the ethnic boost in the 2004 Health Survey for England. Access for some populations, such as undocumented migrants, is another obstacle to research on migrant health. Finally, a lot of research on migrant health is limited to the 'grey literature', not translated into English and it is not used to inform future research or policy making in countries other than where has been undertaken (Ingleby, 2009).

Health information systems in most European countries are not designed for identification of people based on their migration status and, among information collected in the medical field, files rarely include information about the origin or status of the migration. However, one notable exception is that of death registers, which in many countries include indicators of migration or ethnicity. Death registers allowing disaggregation by ethnicity or migrant status are available in 24 EU countries and have been used in several pieces of empirical analysing migrant health (Jiménez-Rubio & Vall Castelló, 2020; Juanmarti Mestres et al., 2021). Country of birth is used as an indicator in 15 countries, citizenship in 8 countries and nationality in 7 countries. Yet, a complicating factor affecting the analysis of mortality data is that migrants often migrate back home when they get old or ill, causing underestimation of migrant mortality in destination countries (Ingleby, 2009).

Another important source of information about migrant health is given by health care utilization data. However, usage levels cannot be equated to actual healthcare needs, as migrants can face barriers in accessing care. Also, the utilization of health services may not always be adequately monitored and recorded, in particular where there are multiple providers covering the private and the public social business sectors and organisations. In 2008-2009, health care utilization registry data allowing for some national or regional identification of migrants was only available in 11 of the 27 EU Member States: Austria, Belgium, Denmark, Finland, Greece, Italy, Luxembourg, the Netherlands, Poland, Slovenia and Sweden (Rechel, 2011). In all 11 countries, data on utilization is available for hospital care, while only a few countries have collected data on care in the out-patient setting. In England, the collection of data on ethnicity is compulsory in secondary school care, except out-patient care, accident and emergency care, and community care settings (Mladovsky, 2009). In 2007-2008, there was 86% coverage of ethnicity in hospital episode statistics (Jayaweera & Quigley, 2010). Lastly, data obtained from censuses at a national level are fundamentally important for scientific analysis. In addition to routinely collected data on the entire population, many governments regularly commission surveys of representative samples of the population, some of which contain information about migrant status or ethnicity. This category includes health surveys, as well as surveys covering broader topics that also contain some health information, such as standard of living surveys. In Sweden, for example, an annual living conditions survey also collects information on self-assessment of one's own health and country of birth of the interviewees, even if it does not contain any information on ethnicity (Mladovsky, 2009). In some cases, more general surveys are complemented by targeted surveys targeting hard-to-reach groups, and qualitative surveys. To give an overview of how the landscape for survey data on migration and health looks like in the EU and what is available to research, Table 1 present a heterogeneous patchwork of health indicators of migrants included in national or European investigations. Data on migrants collected from surveys they typically have serious limitations, such as low response rates and small sampling size; combined with the afore-mentioned weaknesses, this makes it challenging to use these data to measure the health of migrants with respect to the native population. Exceptions include the Netherlands, Sweden and the United Kingdom, who have conducted extensive health surveys of migrants (Ingleby, 2009; Mladovsky, 2009).

Table 1. Examples of surveys collecting health and migration indicators (selected European countries)

Country	Measurement tools	Migration indicators
Belgium	1. **National Health Survey**, organized by the Scientific Institute of Public Health	• place of birth • present nationality
Denmark	1. **National Survey on Health and Morbidity**, published by the National Institute of Public Health in 1987, 1994, 2000 and 2005	• country of birth • parents' country of birth
Germany	1. **Children and adolescent health survey**, Robert-Koch- Institute, conducted between 2003–06	• citizenship of respondent and of his/her parents • country of birth (respondent/ parents) • duration of residency • migrant status
	2. **Telephonic Federal Health Survey**, conducted since 2002 onwards in several consecutive waves by the Robert-Koch-Institute	• country of birth of respondent (not parents) • citizenship (not parents) • year of naturalization • age at migration • duration of stay/residency
	3. **Sexually Transmitted Diseases Sentinel**, conducted by the Robert-Koch-Institute, 2003–05	• country of origin • citizenship • migrant group • age of migration • duration of stay/residency • self-estimated level of command of German
	4. **Microcensus** (Federal Office of Statistics)	• nationality of the respondent • previous nationality (if applicable) • nationality of parents • year of entry
	5. **Socioeconomic panel**	• citizenship

		• country of birth • nationality • residence status • reason for migration • relatives living abroad
France	1. **INSEE (the National Institute of Statistics) population census surveys**	• country of origin • nationality • parental place of birth
	2. **Survey on Health and Social Protection**, conducted by the National Research Institute, the National Statistics Office and the Institut de Recherche et de Documentation en Économie de la Santé biennially since 1988	• country of origin • nationality
Ireland	1. **Survey of Lifestyles, Attitudes and Nutrition (SLAN)**, cross-sectional survey repeated at 4-yearly intervals	• place of birth • start of residence in Ireland • ethnic or cultural background
	2. **Quarterly National Household Survey**	• nationality • citizenship
Italy	Occasional surveys conducted by the Italian Institute of Statistics	• citizenship
Netherlands	1. **POLS (Permanent Research Life Situation)**, administered every year, it is a general survey including topics such as health, but also safety, leisure time, and living and working conditions	• country of birth • country of birth mother • country of birth father
	2. **The Local and National Health Monitor** consists of three different monitors: one that monitors child and youth health; one that monitors public health; and one that monitors elderly health	• country of birth • country of birth mother • country of birth father • self-assessed ethnic identity
	3. **The Second Dutch National Survey of General Practice** was organized by the Netherlands Institute for Health Services Research (NIVEL)	• country of birth • country of birth mother • country of birth father
Spain	1. **National Health Survey 2003**	• Spanish citizens • foreign citizens coming from: the EU; other European country; Canada or the USA; other American country; an African country; an Asian country; a country in Oceania
	2. **Regional/municipal health surveys**	Some of the latest waves of the regional health surveys include a question on the citizenship of the interviewed
Sweden	1. **Annual surveys on**	Respondents are categorized as: • born outside the country

	living conditions (ULF), conducted by Statistics Sweden	(first-generation migrant) • born in the country, but with both parents born outside the country (second generation) • born in the country, but with one parent born outside the country (second generation) • born in the country with both parents also born in the country (not migrant)
	2. **Survey on public health (Folkhälsoenkäten)**, conducted by the Swedish National Institute of Public Health	Respondents are categorized by country of birth: Sweden; other Nordic country; other European country; non-European country
United Kingdom	1. **General Household Survey**, an annual cross- sectional survey conducted by the National Statistics Office	• how many years have you/has(...) lived at this address? • in what country were you/was (...) born? ... • in what year did you (...) first arrive in the United Kingdom? • in what country was your/(...'s) father born? • in what country was your/(...'s) mother born? • what do you consider your national identity to be? • to which of these ethnic groups do you consider you belong?
	2. **British Household Panel Survey**, conducted annually since 1991 by the National Statistics Office	• ethnic group • nationality/country of birth • year of arrival in the United Kingdom
	3. **English Longitudinal Survey of Ageing**, conducted biannually since 1998 by University College London, the Institute of Fiscal Studies and the National Centre for Social Research	• ethnic group • cultural background • country of birth • year of arrival
	4. **1970 British Cohort Study**, conducted by the Centre for Longitudinal Studies. Surveys have been conducted at birth (1970), then again after 10, 16, 26, 29 and 34 years	• ethnicity (based on 2001 census question)
	5. **Millennium Cohort Study**, conducted so far at the age of 9 months, 3, 5 and 7 years	• ethnic group
	6. **Health Surveys for England and Scotland** (annual)	• ethnic origin • country of birth

3.2 Methods in Existing Literature

Most literature addressing empirical studies and measures of migrant health or access to health care services is limited to qualitative or mixed methodologies. This is mostly due to the lack of reliable and comprehensive datasets linking relevant health information and medical history of patients with their migration status and ethnic background (as addressed in previous sections). Such data limitations lead to little scope for generalization and replicability of many empirical studies which have been delivered in the economic field: I am going to focus this methodological review on the two geographical contexts of interest for my research contribution, i.e., Germany and the UK.

O'Donnell et al. (2007) reports on the use of two different qualitative methods to assess health care needs and beliefs of asylum seekers living in the UK: focus groups facilitated by members of the asylum-seeking community and interviews, either one-to-one or in a group, conducted through an interpreter. Other cases of using interviews as part of the methodologies are the studies conducted by Kang et al. (2019) and Papageorgiou et al. (2020). While the former use face-to-face semi-structured recorded interviews to asylum seekers to discuss their experience with primary care access in the UK in 2018, following the 2017 NHS charges for overseas visitors affecting community care for refused asylum seekers, the latter include thematic analysis and constant-comparison approach together with semi-structured interviews. In this second case, interviews were not restricted to asylum-seeking patients but also included healthcare providers and non-clinical volunteers working in community or hospital-based settings who had experience of migrants accessing NHS England services. In Fox & Hiam (2018)'s article on the impact of NHS changes on individuals in vulnerable positions trying to access care, the authors analyse case studies from Doctors of the World clinics. Regarding the UK case study, there is also some literature addressing the impact of the NHS reform with a quantitative approach. Potter et al. (2020) use univariable logistic regression to manually select exposure variables for inclusion in a multivariable model to test the association between diagnostic delay in tuberculosis cases among migrants and the implementation of the Cost Recovery Programme and show that non-UK born patients were more likely to have a delay in diagnosis after policy changes to recoup costs from 'chargeable' patients became effective as part of the 'NHS Visitor and Migrant Cost Recovery Programme Implementation Plan'. More recently, Dobbin et al. (2022) use multiple linear regression to explore the relationship between sex, age, nationality, ethnicity, urgency and the cost of health care among overseas visitor patients at non-specialist NHS trusts. Quantitative research has provided interesting and insightful results into the impact of policies on access to care: however, it often remains limited to the cross-section and small-scale size.

Also in the case of the territorial variation in Germany between states adopting the health insurance card for asylum seekers and states sticking to the health voucher for delivering access to care, there are several empirical studies using mainly qualitative methodologies. Kuehne et al. (2015) explore the health of undocumented migrants using a mixed method approach including complementary qualitative and quantitative datasets, whereby migrants are asked to fill in the SF-12v2, a standardized questionnaire measuring health-related quality of life. Differences in mean scores for quality of life are then evaluated with a t-test and with a generalized linear model, focusing on the effect of living without legal status on health-related quality of living. The quantitative research is complemented by a qualitative ethnographic study on undocumented migration and health in Berlin, Germany. Also Grochtdreis et al. (2022) focus on health-related quality of life, measuring it using a modified version of the SF-12v2 questionnaire and presenting it as physical (PCS) and mental (MCS) component summary scores. They then examine associations between PCS and MCS scores and sociodemographic variables by a linear regression with bootstrapped standard errors to estimate the quality of life of asylum seekers and refugees that arrived during the European migrant and refugee crisis in Germany between 2014 and 2017. Gewalt et al. (2019) opt instead for a pure qualitative, prospective approach, with individual semi-structured interviews of asylum-seeking mothers during pregnancy and up to the six-week postnatal assessment, to gain in-depth insights into migrant women's experiences and perceived needs with a focus on material circumstances whilst living in state-provided accommodation. On quantitative approaches, one relevant example is the work of Müllerschön et al. (2019), who conducted a cross-sectional survey on knowledge, attitude, behaviour, practice regarding HIV, viral hepatitis and sexually transmitted infections among migrants from sub-Saharan Africa in Germany. The authors then calculated unadjusted and adjusted Odds Ratios, chi-squared tests and 95% confidence intervals to detect differences between participants with a regular health insurance card compared to asylum seekers with a medical treatment voucher or participants without health insurance or medical treatment voucher. Overall, the picture of quantitative empirical assessments on migrant health in Germany looks limited to cross-sectional analysis, especially when it comes to asylum seekers and undocumented migrants, for which only few datasets at federal level exists and aggregation is mainly possible within state and district borders (Biddle et al., 2019a). One paper exploiting the quasi-random assignment of refugees to municipalities to realize a quasi-natural experiment is the work of Wenner et al. (2020): their sample includes newly assigned refugees from six municipalities (three for each model, i.e., the health insurance card and the medical voucher) in 2016 and 2017 in Germany's largest federal state, North Rhine-Westphalia and the analysis compares the standardized incidence rates of specialist services use, emergency services use, and hospitalization due to ambulatory care sensitive conditions between both models. Similarly to their approach, my analysis also exploits this territorial variation, but observe health outcomes on a longitudinal scale using panel data techniques.

3.3 This Paper’s Contribution

In both of my case studies, I exploit longitudinal datasets, with repeated cross-sectional observations. Both datasets come from a nationally representative survey: more specifically, I use the UK Household Longitudinal Survey – Understanding Society for studying the effects of cost recovery policy changes in the NHS structure on temporary migrant health over a time span of 21 years (2000-2021)[3]; and the German Socio-economic Panel (SOEP) for looking at the impact on asylum seekers’ utilization of health of different administrative mechanisms for the determining access to care. Both surveys allow the use of panel data methodologies for estimating impact and assess causality of policy changes on health outcomes in a quasi-experimental setting. In my analysis I make use of the difference-in-differences (DiD) approach and I rely on recent literature on the most relevant advances in DiD. In the “canonical” DiD model, where units are observed over two time periods, there is a treated population of units that receives a treatment of interest (e.g., being targeted by a policy) in the second period, and a comparison population that does not receive the treatment in either period. The key identifying assumption of the model is that treated and comparison populations would have followed “parallel trends” in the average outcome of interest were it not for the treatment[4]. Given this assumption, researchers can estimate the average treatment effect on the treated (ATT): in the presence of a large number of independent clusters from the treated and comparison populations, this can be consistently estimated using a two-way fixed effects (TWFE) regression specification, and clustered standard errors provide asymptotically valid inference. In reality, DiD applications typically do not meet all of the assumptions required to of the canonical framework. Recent wave of DiD papers have focused on relaxing some of the

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[3] The waves used in the final analysis range from BHPS Wave 10 up to UKHLS Wave 11: observations sampled in years prior to 2009 (included) come from the predecessor survey of Understanding Society, the British Household Panel Survey.

[4] Another key assumption for identification is that the treatment has no causal effect before its implementation (no anticipation).

assumptions in the canonical DiD setup (Roth et al., 2022a). One strand of the DiD literature has focused on settings where the periods over which units are observed are more than two and treatment start at different moments in time. In this case, since treatment is heterogenous across time and cohorts, the coefficients from standard TWFE models may not represent a precise weighted average of unit-level treatment effects. A dangerous pitfall of TWFE estimation is that it allows both ‘clean’ comparisons between treated and not-yet-treated units, but also ‘forbidden’ comparisons between units who are both already-treated, potentially leading to estimation bias in the estimation of parameters[5] (Roth et al., 2022a). Several alternative estimators to TWFE have been proposed: Callaway & Sant’Anna (2021) infer the counterfactual outcomes for treated units using trends in outcome for an appropriately chosen ‘clean’ control group of untreated units. More specifically, they consider two approaches for building the control group: the first uses only never-treated units, and the second uses all not-yet-treated units. Their estimator holds two advantages, i.e., it provides sensible and reliable stands even under heterogeneity treatment effects across cohorts, and it clearly states which units are being used as controls to infer the unobserved potential outcomes. Other recent papers suggest similar alternative estimation strategies. De Chaisemartin & D'Haultfoeuille (2019) develop an estimator similar to the one of Callaway & Sant’Anna (2021) that can also be applied when treatment turns on and off for some units. Other innovative proposals for efficient estimators include those of Sun & Abraham (2021), who propose an estimator that uses the last-to-be-treated units as controls, Marcus & Sant’Anna (2021), who propose a recursive estimator exploiting the same identifying assumptions as in Callaway & Sant’Anna (2021), Cengiz et al. (2019), whose approach is to run a stacked regression where each treated unit is matched to not-yet-treated controls and there are separate fixed effects for each set of treated units and their controls,

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[5] Due to the failure in identifying already-treated units, TWFE might end up having the opposite sign of all individual-level treatment effects due to “negative weighting” problems. Also, even if all of the weights are positive, the weights resulting from TWFE regressions may not correspond with the most policy-relevant parameter (Roth et al., 2022a).

Imai & Kim (2021), Goodman-Bacon et al. (2019) and Strezhnev (2018). Other related estimators that slightly differ from the previously mentioned approaches are the ones designed by Borusyak et al. (2021) and Wooldridge (2021): they run a TWFE regression using observations only for units and time periods that are not-yet-treated, infer the never-treated potential outcome for each unit using the predicted value from this regression and then average all individual-level treatment effects to form summary parameters. Such approaches, despite improving efficiency since it averages over more periods, relies on a stronger parallel trend assumption for the validity of the estimator, which may lead to larger biases if the parallel trends assumption holds only approximately. In my analysis, I make use of a staggered DiD estimator developed under the approach of Callaway & Sant'Anna (2021), where treated units receive treatment at different moments in time and not-yet-treated units are used as comparisons. My choice is partially informed by the strong parallel trends assumption required under other approaches, which is relatively unlikely to hold perfectly in an empirical setting. In particular, in my DiD estimation, I relax the assumption on parallel pre-trends making them conditional on observed covariates and test for the presence of time-varying confounding factors, as suggested by another strand of literature focusing on relaxing the parallel trends condition (Kahn-Lang & Lang, 2018; Dimitrovová et al., 2020).

As for the identification of migrants and asylum seekers throughout both surveys, I have been confronted with the issue of under-sampling ethnic minorities and migrants, especially in early waves. Typically, surveys started dedicating boost samples, or *ad hoc* oversampling strategies, to immigrant individuals and communities in more recent years. While this facilitates identification of non-native residents and allows for cross-sectional analysis, it still does not help in the case of a panel or repeated cross-section investigation, as in early years there were no questions in the surveys regarding individuals' origin, migration journey, or asylum applications. I adopt a different approach in both empirical papers: based on information about the respondent's migration history, their ethnic origin and history of migration to the host country, I created a flag for being an immigrant, a refugee or an asylum seeker at the point of interview. This way, I have been able to obtain representative samples with enough observations to allow for a repeated cross-sectional analysis.

4 Conclusion

In this brief overview, I have been over the main literature informing my analysis. My contribution articulates in two empirical papers, both adding to the literature on health and migration, particularly to the strand of literature focused on empirical evaluation of the impact of health and welfare policies on the health outcomes and access to medical care of migrants and asylum seekers. In my first paper, I exploit a time and geographical discontinuity in the introduction of a surrogate health insurance card for asylum seekers and refugees in Germany that supposedly facilitates access to care. Focusing on a group of individuals who entered Germany as asylum seekers and have been in the country for less than 18 months at time of interview within the SOEP survey, I look at discontinuities in self-reported health and indicators of incidence and frequency of use of health care triggered by different legislation in place in the municipality of residence of respondents. I found that individuals who benefit from a surrogate health insurance card which is similar in every aspect to the one that German citizens hold for access to welfare and care report higher levels of health and satisfaction with their health, and lower likelihood of being worried about their health or experience daily limitations due to poor health. On the side of factual access to medical care, the use of the card positively associates with decreased frequency of access to outpatient care (number of days spent at the hospital). This evidence is in line with previous results in literature indicating that the eHIC could play a significant role in improving (self-assessed) state of health, increasing satisfaction and reducing hospitalization rates (Claassen & Jäger, 2018; Wenner et al., 2020; Gottlieb et al., 2021). Possible drivers of this effect could be that the introduction of eHIC eliminates the intermediation of home office bureaucracy in individuals’ medical needs and makes access to health care more immediate. Also, individuals who wait for a voucher before getting access to the service they need might be deterred from asking and prompt and timely treatment instead makes the patient feel safe and content about the way their health needs are addressed. Later on I consider a larger sample of individuals with a history of asylum seeking and I look at their rate of utilization of access to care in Germany long-term, i.e., after their status in the host country has been legalized. Results confirm that exposure to eHIC at moment of first access to health care in Germany somehow significantly shapes long-term utilization of the health care system. Once they benefit from SSHI, former asylum seekers who used eHIC register on average higher number of hospital stays than former asylum seekers who used the voucher. In comparison with German natives, AS&R who benefited from eHIC for the first months of their residence in Germany are not different in their utilization of outpatient care but do tend to make more use of inpatient care and be hospitalized overnight more frequently. This is in line with evidence in literature of progressive deterioration of asylum seekers’ health and a pattern of ‘unhealthy assimilation’ to the health conditions of natives (Giuntella & Stella, 2017).

My second paper provides insight into the impact of a NHS-wide reform to regulate eligibility for treatment and access to care for non-EEA temporary migrants on migrant healthcare utilization. I leverage a policy change that has been in effect since April 2015, namely the NHS Act 2014. The act made health entitlements conditional on immigration status and introduced the immigration health surcharge, which temporary migrants outside the EEA they must pay at the same time as the visa application in order to access the services of the NHS as normal residents do. I investigated the effect of the act on several outcomes of the use of health services (primary care, secondary outpatient and hospitalization care) and indicators of health status and satisfaction with one's health conditions. Using a difference-in-differences approach, I found evidence of significant effects on several aspects of healthcare use, highly differentiated by gender, age, ethnic origin and country of residence in the UK. Results show significant impact for women on use of medical treatment at the intensive margin and on state of health, whereas men display significant impact on their satisfaction about personal health: this is in line with evidence in existing literature that focuses on migrant women and mothers and their poor health outcomes (Jayaweera and Quigley, 2010). Furthermore, I use data from the immigration statistics collected by the Home Office on applications for entry clearance visas, grants of visas and of extensions of stay in the UK and returns. Evidence from the analysis of time trends suggest that the results of the DiD model are unlikely to suffer from bias due to sudden change in in and out migratory flows.

By using longitudinal data, my pieces of analysis also contributes to the field of research studying the ‘healthy migrant effect’ (Holz, 2021) and the evolution of migrant health in the host country: I examine outcomes both on the short and the long run (i.e., prior to fully access to the health system in the host country and shortly after legalization or residence status) and give a meaningful contribution to the claim that migrant health is shaped by assimilation in the host country. Methodologically, I make use of cross-section repeated observations to apply panel data estimation techniques and both datasets used in my analysis are taken from nationally-representative long-run surveys. Whereas relevant literature in the field of health and migration uses cross-section, local and small-scaled datasets thus hindering generalization and reproducibility of results, I use difference-in-differences methods to assess causal impact. Even though results from both empirical analyses are inherently linked to two specific national context (Germany and the UK) and thus does not necessarily hold for groups of migrants in other receiving countries, it constitutes an important empirical assessment of a change in policy concerning the link between immigration status and health rights.

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Health Policy and Access to Health Care in Germany: Empirical Assessment of a Fragmented System for Asylum Seekers' Health

1 Introduction

The regulation of access to health care for immigrants is a point of heated debate across European countries. Amongst the attempts to set standards in the granting of social rights to individuals who do are not citizens of the country they live in, Germany stands out as a paradox for the delivery of health care services. The German system of statutory social and health insurance (SSHI) is often cited as role model for other welfare states (Busse et al. 2017, Gottlieb and Schülle 2021), yet it fails to extend the same level of welfare rights to asylum seekers and refugees (AS&R), who are subject to inequalities in their entitlement to receiving adequate care. Up until November 1993, they had been included under the coverage of SSHI akin to German citizens. The Asylum Seeker Benefits Act (AsylbLG) of November 1st 1993 defined a new scope of welfare entitlements for asylum seekers and refugees and has since then regulated the eligibility for and scope of fundamental welfare benefits, including access to health care services (Bozorgmehr & Razum, 2015). Among the categories who are excluded from SSHI and subject to a separate welfare provision system we find migrants who have submitted an asylum application and whose application is still under review by competent authorities (asylum determination procedure still pending); refugees whose asylum application has been denied but cannot be repatriated; persons with renewable legal status, e.g. a residence permit on humanitarian grounds or status of "tolerated stay-non deportability"; and undocumented migrants (Gottlieb & Schülle, 2021). These groups are entitled to receive medical assistance concerning emergency health situations, acute and painful conditions, pregnancy and childbirth, vaccinations and other necessary preventive measures. A change in their entitlement to welfare benefits, i.e. a shift from restricted to unrestricted access, is conditional on either a change in residence status or the duration of uninterrupted stay in Germany under restricted access (Bozorgmehr & Razum, 2015b). Restrictions of social and health rights granted to asylum seekers came into law amidst what was pictured by some media and politicians as an "abuse of asylum" and an "invasion" of refugees and asylum seekers: in a context of rising anti-immigrant violence and xenophobic riots, the government took action to counteract what was perceived as the problem, i.e. the number and scope of rights of asylum seekers in Germany and the extra burden that their entitlements to health care services allegedly represents for German taxpayers (Gottlieb & Schülle, 2021; Spura et al., 2017). It is possible, however, that providing no more than a basic level of access to care leads to the exact opposite effect. First of all, restrictions in access might lead to delayed care and to the shift of treatment from the primary sector (less expensive) to the more costly secondary and tertiary sector for more acute and severe conditions. Also, this process of separation might participate in fostering a climate of social exclusion and marginalization and a situation of "othering", which in turn may add on mental distress that asylum seekers already probably face due to the circumstances of their forced migration. Other features of AsylbLG that have a potential detrimental impact on asylum seekers' health and well-being can be related to the nature of institutional facilities where asylum seekers must reside for the duration of their 'waiting time', i.e., the period during which they are subject to restrictions in access to welfare benefits: scattered geographical accessibility, separation from local communities and crowding might negatively affect mental as well as physical health (Bozorgmehr & Razum, 2015b).

Of all the potential issues arising with being subject to a separate system for accessing medical care, this paper focuses on the one represented by different administrative barriers. The state governments and, to some extent, the municipalities have the responsibility to determine how health care is de facto available for individuals whose rights are defined by the AsylbLG. In this context, two administrative mechanisms are at use in Germany, namely the health care voucher and the electronic health insurance card (eHIC) (Gottlieb & Schülle, 2021b).

This paper aims at providing quantitative evidence of the impact that the implementation of either one of these mechanisms for determining eligibility and regulating access to health care services has on asylum seekers' health and utilization of health care. I will do so by comparing the health status and behaviour of AS&R using either the card or the voucher, examining what different patterns of utilization of health care are associated with each tool and exposing possible causal relation between inequalities in access to care and long-term use of health care. Several empirical pieces of research deal with the health of asylum seekers in Germany and shed light on their reality of restricted access to health care and deteriorating health (Kuehne et al. 2015, Bozorgmehr et al. 2016, Biddle et al. 2019, Walther et al. 2020). Most of them relies on qualitative or mixed-methods and on cross-sectional or local surveys, limiting the external validity and potential for generalization of results and information of public policy. In this analysis, I use data from the German Socio-economic Panel (SOEP), a nation-wide survey covering several aspects of daily life of German resident households and available since 1984. The SOEP datasets have been widely used for research on health and migration, specifically to provide a measure of AS&R quality of life (Grochtdreis et al. 2022); to quantify the rate of health services utilization of migrants in Germany (Wadsworth 2013); to assess how the experience of migration affects health of both natives and immigrants over time (Giuntella and Mazzonna 2014). This paper is indebted to previous studies studying different health utilization and behaviour patterns among migrants and natives (Spura et al. 2017, Wenner et al. 2020). In this contribution, I introduce the dynamics of adoption of the eHIC as a mechanism for AS&R to access health care services in shaping access to and utilization of health care. Other pieces of relevant literature have been attempting to exploit the variation in health policy across German states to analyse health determinants for AS&R and the effect that improved access to care has on health services utilization (Claassen and Jäger 2018, Jäger et al. 2019, Wenner et al. 2020), health care expenditures (Bozorgmehr and Razum 2015) and the local health system and health care workers (Gottlieb et al. 2022). In most existing approaches, the number of respondents is extremely limited (due to budget constraints or scarce responsiveness from participants in facilities) and, despite the significance of the effects found, results have scarce potential for generalization beyond the local level. In this paper, I exploit the longitudinal nature of the SOEP combined with health policy discontinuities at federal level to infer on existing inequalities in access to health care penalizing AS&R; to my knowledge, this is a novelty so far in the existing empirical literature. This analysis wants to provide quantitative evidence of the impact that the implementation of the electronic health insurance card had on AS&R health and utilization of health care. The main hypothesis is that restrictions in access correlate with affected individuals' detrimental health outcomes. Results of a pooled OLS regression show that indeed access to eHIC is associated with better self-reported health, more satisfaction and less worry about respondents' own health conditions, and less utilization of outpatient care. In a second step, I consider a larger sample of individuals with asylum-seeking history who are covered by statutory health insurance in Germany and rely on a staggered Difference-in-differences (DiD) model to assess the medium- and long-term impact of eHIC on their utilization of medical services. To my knowledge, no other empirical study tackling the issue of AS&R health in Germany has exploited the same methodology so far. Findings show that AS&R who benefited from eHIC tend to differ in their utilization of health care from those who did not; they also tend to assimilate to natives in their use of outpatient care over the years. I include several indicators of health available in the survey, either objective (e.g., number of visits to the doctor or number of stays in the hospital) or subjective and relying on the respondent's self-assessment (e.g., individual's satisfaction with their own health).

2 Institutional Setting and Literature Review

In this section I will present the context where the health policy has been designed and introduced. I will then summarize existing relevant literature and how my research contributes to the topic.

2.1 Institutional Context

At present, asylum seekers and refugees are not covered by statutory health insurance immediately from their arrival in Germany. During the first 18 months of uninterrupted stay in Germany or until refugee status is granted, applicants' scope of entitlement to welfare benefits is regulated by the AsylbLG (1993). In terms of health, asylum seekers have the right to success medical and dental treatment in case they are experiencing acute illness or pain; they also can benefit from preventive services and immunization, as well as recommended pre- and perinatal health services. Every other medical need has to be previously assessed by welfare and immigration officers against the content of the AsylbLG (1993). The scope of health entitlements for asylum seekers lies thus below the legally defined subsistence level, and they only receive analogous benefits to German welfare recipients either after completion of 18 months of residence on German soil or upon receiving refugee status. Once either one of these requirements has been fulfilled, the recipient becomes full member of a Sickness Fund by virtue of the German Social Code and enjoy unrestricted access to medical care services (Gottlieb & Schülle, 2021c). During the period of restricted access to health care, responsibilities for guaranteeing asylum seekers' health rights is shared and shifted among several authority level. Upon arrival in Germany, responsibility for ensuring asylum seekers' social and health needs falls upon the federal state (Bundesland): asylum seekers get registered in the 'initial distribution system of asylum-seekers' (EASY) and housed in reception centres (in German: Erstaufnahmeeinrichtungen, EAE) run by the states. Re-assignment across federal states occurs within the framework set by the 'Königstein Quota System', i.e., a formula for determining the quota of asylum seekers that each Bundesland can receive, whereby each state’s share depends for two thirds on the state’s tax revenues and for one third on population sizes (Koch-Institut, n.d.). The states, in turn, allocates asylum seekers to local authorities, by which responsibility for health care provision shifts to municipalities or district administrations. At the local level, welfare offices plays the most important role in handling the administrative and budgetary side of social and health benefits as well as monitoring access to medical care services. In other words, they determine eligibility and actual provision of care for asylum seekers, and they can do so through two different administrative mechanisms: the health care voucher (HV) and the health insurance card (HIC).

Table 1 gives an overview of how asylum seeker health policies shape scope of entitlements to health care services for AS&R currently in Germany, which organs carry the cost, what legal basis their health rights have, and the way they can access health care at different moments of their residence. Figure 1 offers instead a visual representation of how the length of duration of stay during which AS&R are subject to the AsylbLG has been amended over the past 28 years, with the last update being in June 2019. Pending determination of legal status and the conclusion of the asylum procedure, or until the designated length of the ‘waiting period’ is exhausted, AS&R have unrestricted access to emergency care and can access any other primary and secondary care service through one of two administrative procedures: the health voucher or the electronic health insurance card. With the former, prospective patients must first apply for the issue of a voucher from the welfare office: such vouchers entitle the holder to seek care from a public health care provider of their choice within the administrative district and to attend care for as often as they need within the period stated in the voucher (usually three months). As an alternative mechanism, the 2015 Asylum Procedure Acceleration Bill introduced the possibility for local authorities to contract public Sickness Funds for asylum-seeker health care provision: asylum seekers can thus access medical services in the same way as citizens with statutory health insurance, thanks to a health insurance card that acts as a “surrogate” of SSHI. The only actual difference between eHIC-holders and German citizens lies in the cost-bearers: in the case of asylum seekers, the state[6] covers health care costs, hence the need for a previous agreement with public local providers of health care. Prerequisite for the introduction of the eHIC is the conclusion of a master agreement between the state government and public Sickness Funds: upon this, practice shows that states have either chosen to introduce the eHIC comprehensively or defer decision to district or municipality administrations on whether to make use of the new mechanism or stick to the voucher (Gottlieb & Schülle, 2021).

Table 1. Health Entitlements of Asylum Seekers & Refugees in Germany

<table>
<tr><th>Length of stay/legal status</th><th>Arrival</th><th colspan="2">≤ T[7] months/pending asylum procedure</th><th>> T months/pending asylum procedure</th><th>Refugee status</th></tr>
<tr><td>Social benefits regulated by:</td><td>§3 AsylbLG</td><td colspan="2">§3 AsylbLG</td><td>§2 AsylbLG</td><td>Code of Social Law</td></tr>
<tr><td>Scope of health entitlements:</td><td>Restricted</td><td colspan="2">Restricted</td><td>Analogous to statutory health insurance</td><td>Regular</td></tr>
<tr><td>Payer:</td><td>Federal state/State</td><td colspan="2">State/Municipality</td><td>State/Municipality</td><td>Insured</td></tr>
<tr><td>Access to healthcare:</td><td>Basic health care provision</td><td>**Health care voucher (HV)**</td><td>**Health insurance card (eHIC)**</td><td>Regular health insurance card</td><td>Regular health insurance card</td></tr>
</table>

Notes: The content of this table is taken by the analysis made by Gottlieb & Schülle (2021b).

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[6] As shown in Table 2, costs are sometimes divided between Bundesländer, Landkreise and Gemeinden, or even deferred entirely to lower administration levels, together with decision-making power.

[7] I have previously mentioned that the period during which AS&R are subject to AsylbLG scope of entitlements is currently 18 months of uninterrupted stay in Germany (can end sooner pending a formal decision on their legal status). However, I chose to not label this duration with the current number of months since, for the scope of this analysis, I will consider a large span of years during which ‘T’ varies considerably.

Figure 1. Evolution of length of 'waiting period'

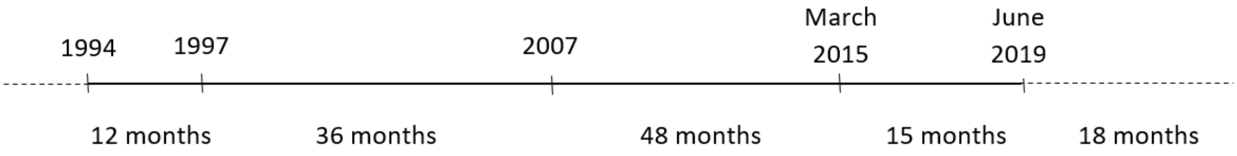

Table 2 shows a summary of eHIC implementation across all Bundesländer, starting with states where the eHIC has been completely dimissed to the ones where it is still in place.

Table 2. Introduction of eHIC in German Bundesländer

	Introduction of eHIC	Cost bearers	eHIC in all the state	Year(s) of introduction
Bremen	Yes	Municipalities	Yes	2005
Hamburg	Yes	State	Yes	2012
Berlin	Yes	State	Yes	2016
Schleswig-Holstein	Yes	State (partially)	Yes	2016
Thüringen	Yes	State	Yes	2017
Brandenburg	Yes	State	No	2016-2018
Nordrhein-Westfalen	Yes	State/municipalities	No	2016-2019
Rheinland-Pfalz	Yes	State/municipalities	No	2017
Niedersachsen	Yes	State/municipalities	No	2016-2019
Sachsen	Yes	Municipalities	No	2020
Saarland	No	-	No	-
Hessen	No	-	No	-
Baden-Württemberg	No	-	No	-
Mecklenburg-Vorpommern	No	-	No	-
Sachsen-Anhalt	No	-	No	-
Bayern	No	-	No	-

The introduction of the opportunity for asylum seekers to have access in a similar way as citizens under the SSHI has given rise to opponent factions in political debates on the advantages and disadvantages of one mechanism compared to the other. Opponents of the eHIC see it as a way of giving up control over access to medical care, thus leading to overuse of outpatient health services and rising medical expenses, as well as an incentive for unsolicited migration for medical reasons (so-called phenomenon of "health tourism"). On the other hand, those in favour of introducing the eHIC argue that it reduces administrative costs by simplifying bureaucratic procedures, and that guaranteeing timely access to outpatient care contributes to reducing costs as it shifts treatment from the more costly emergency care sector to early detection and preventive services. However, the main argument provided in favour of the eHIC relates to the government moral and legal duty to grant adequate and non-discriminatory access to health care services to everyone (Gottlieb et al., 2021a). Not all German states stipulated master agreements with the Sickness Funds to introduce the eHIC, and some of them did not even get the process started. By 2021, the federal governments of Baden-Württemberg, Bayern, Mecklenburg-Vorpommern, Hessen, Sachsen-Anhalt and Saarland have ruled out eHIC; the governments of five Bundesländer have comprehensively introduced eHIC at state level at different moments in time between 2005 and 2017 (Bremen, Hamburg, Berlin, Schleswig-Holstein and Thüringen). Among the others, some states have concluded master agreements with Sickness Funds and delegated implementation at a lower governmental level, giving rise to a patchwork of different situations: Brandenburg has all but one of its Landkreise (administrative districts) adopting the eHIC, whereas in Nordrhein-Westfalen 25 out of 396 municipalities implemented the eHIC[8], and three districts both in Niedersachsen and Rheinland-

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[8] Four of these municipalities have gone back on their decision between 2017 and 2018 and dismissed the newly introduced eHIC in favour of the voucher.

Pfalz have followed. The last municipality so far to conclude the process of eHIC introduction has been Dresden (Sachsen) in April 2020 (*Einführung Der Gesundheitskarte Für Asylsuchende Und Flüchtlinge*, n.d.; *Einführung Der Gesundheitskarte Für Asylsuchende Und Flüchtlinge Der Umsetzungsstand Im Überblick Der Bundesländer*, n.d.).

2.2 Literature Review

This paper relies on the comprehensive overview of Germany's statutory social and health system laid out by Busse et al. (2017). Gottlieb and Schülle provided a detailed critical analysis of the situation faced by asylum seekers in Germany in terms of access to health care services, outlining the shifts and changes in health policy and the administrative divergency at state government and municipality levels (Gottlieb & Schülle, 2021b). Several pieces of research deal with asylum seekers' health in Germany and highlight their reality of restricted access to medical services and deteriorating health. Biddle et al. use observations from a state-wide, cross-sectional, population-based health monitoring survey among asylum seekers, refugees and their offspring residing in accommodation centres in 44 districts in Baden-Württemberg to investigate relevant morbidities and patterns of care. Their results show the existence of a gap between actual health needs and medical services utilization among asylum seekers, especially males and individuals residing in rural areas (Biddle et al., 2019b). With the same focus of equity in health, Hahn et al. interview asylum seekers in a rural area in the federal state of Schleswig-Holstein on their experience in accessing health care services, highlighting several bureaucratic as well as cultural barriers (Hahn et al., 2020). Other studies (Kuehne et al., 2015b; Schneider et al., 2015) make use of mixed methods including complementary quantitative and qualitative datasets (e.g., standardized questionnaire, semi-structured interviews, informal conversations and participant observation) to investigate patterns of inequality in access to health. They provide evidence for reduced use of outpatient physicians and GPs by asylum seeker respondents, paired with higher likelihood than the general population to report hospital admissions, suggesting the hypothesis that barriers to access generate situation of delayed care and shift of treatment from prevention and primary assistance to hospital (with possible decreasing of health conditions). Also, observations on subjective experiences of illness and health show the detrimental impact that precarious legal entitlements to welfare and benefits have on mental and physical health of asylum seekers and refugees. All among the afore-mentioned pieces of research agree on the disadvantaged position asylum seekers and refugees face in Germany in terms of access to health care and unmet health needs and provide evidence on the claim that limited access to medical care may reasonably exacerbate physical and mental precarious states. Driven by the same focus on equity in health system, my paper uses data from the German Socio-economic Panel (SOEP) on asylum seekers residing in Germany and relies on a quantitative approach to infer on the relation between restricted access to care as sanctioned in the AsylbLG and health status, health utilization and satisfaction with one's own health.

SOEP datasets have been widely used for research on health and migration. Grochtdreis et al. analyse health-related quality of life of refugees and asylum seekers in Germany using the SOEP Refugee Sample and provide a measure of quality of life with the use of descriptive statistics on socio-demographic variables to build physical health and mental health scores (Grochtdreis et al., 2022b). Theirs is not the only paper using SOEP data to address the issue of refugees' and migrants' utilization of health services in the destination country and the widespread concern that immigrants puts severe additional and differential pressures on welfare services: Grochtdreis et al. focus on inequalities in health services utilization between migrants and non-migrants in Germany, whereas Wadsworth investigates the rate of health services utilization of migrants in Germany and UK. In the first piece of research, direct migration background is found to be associated with lower number of visits to the doctor and general lower healthcare utilization, compared with people with indirect migration background or no migration background at all (Grochtdreis et al., 2021b); in the second one, Wadsworth finds evidence that migrants to Germany are more likely to self-report poor health than the native-born population, whereas they use hospital and GP services at broadly the same rate as German citizens (Wadsworth, 2013). Giuntella and Mazzonna link observations on health of migrants to labour market information: they exploit the longitudinal component and individual characteristics of SOEP datasets to investigate how immigration affects health of both natives and immigrants over time. Their results are heterogenous by occupation sector, education, arrival cohort, and show that immigration reduces the likelihood that residents report negative health outcomes by substituting natives in the most physical-demanding occupation sectors (Giuntella & Mazzonna, 2014). Focusing just on refugees in Germany, Heidinger highlights the diversity of refugees' support service needs as well as the differences existing in utilization in eight different domains of welfare services for asylum seekers and refugees (Heidinger, n.d.). Using information on physical and mental health outcomes from the SOEP Refugee Sample, Holz tests for the presence and heterogeneity of the Healthy Migrant Effect: propensity score matching analyses reveal the presence of such an effect for both European and Non-European migrants, but not for internal migrants (Holz, 2021). Similarly to this existing literature, this paper uses SOEP datasets and information on health and migration background, as well as length of stay and legal status of respondents, to make inference on the relation between health and restrictions in access. In addition to previous studies studying different heath patterns among migrants and non-migrants (or refugees and economic migrants, or individuals with direct and indirect migration background), I add among the determinants of health trajectories and health utilization patterns the dynamics of introduction of a health insurance card as a mechanism for asylum seekers to access health care services, opposite to the issue of a voucher.

Other pieces of relevant literature studying health and migration have been attempting to exploit the variation in health policy across German *Bundesländer* to analyse health determinants for asylum seekers and refugees. Bozorgmehr and Razum use aggregated longitudinal census data on registered asylum seekers from the Federal Statistics Office in Germany to compare health expenditures: they exploit the variation in duration of 'waiting time', i.e., the duration of time that an asylum seeker has to uninterruptedly spend in Germany before they can get unrestricted access to welfare and health benefits. Their results provide evidence in support of the claim that the cost of exclusion from health care among asylum seekers and refugees is ultimately higher (in terms of incident health expenditures) than granting regular access to needed services: contrary to popular lines of arguments in the media and public discourse, per capita health expenditures in the group exposed to restricted access were higher than in the group with regular access (Bozorgmehr & Razum, 2015b). Several other pieces of literature exploit variation in introduction of the health insurance card for refugees and asylum seekers during their 'waiting time' in Germany to assess the causality of improved access to health care services on health services utilization and health care expenditures (Claassen & Jäger, 2018; Gottlieb et al., 2021; Jäger et al., 2019; Spura et al., 2017; Wenner et al., 2020). Most of them make use of qualitative methods, e.g., interviews to medical and administrative staff and asylum seekers, or mixed methods, such as comparison of costs for inpatient and outpatient care for asylum seekers before and after the introduction of the card. Also, and most typically in the case where a qualitative approach has been chosen, the number of respondents is extremely limited (due to budget constraints or scarce responsiveness from participants in facilities) and no generalization of results can be made beyond local level. This paper uses nationally representative data at federal state-level to provide a quantitative assessment of the claim that restrictions in access have a detrimental effect on affected individuals' health outcomes and health utilization patterns. Also, I have used several indicators of health available in the survey, either objective (e.g., number of visits to the doctor or number of stays in the hospital) or subjective and relying on the respondent's self-assessment, such as questions on the individual's satisfaction with their own health. The reason behind this choice is to analyse the existence of possible effects on a plurality of health indicators and better inform conclusions on causality.

3 Data and Variables

In the next section I will first describe the dataset, the Socio-economic Panel, criteria for sample selection and definition of the outcome variables of interest for the analysis.

3.1 Sample Selection

For sample creation, I had access to information from the German Socio-economic Panel (SOEP), a longitudinal survey representative of private households in Germany, running from 1984 to present days collected by the German Institute for Economic Research, DIW Berlin. Of the many studies that make up the SOEP[9], I used the SOEP-Core study, which contains information on the household as a whole and also on each individual member of the household. Topics covered in the survey range from housing to education and employment, from family composition and social networks to income, taxes and social security. Of primary interest for the scope of this analysis are information on health and health care, and migration background and integration. The sampling strategy of the SOEP is to keep sampling the original sample of the first wave together with every household and person that enter the survey later in time, e.g., when individuals move out of their original family unit and form their own, when additional family member join a SOEP household, or when original SOEP members give birth to new individuals. Moreover, the SOEP periodically update the survey with refreshment samples: in 2013, the first Migration Sample M1 was added to the SOEP-Core, with the aim of over-sampling individuals with migration backgrounds. It was followed in 2015 by a second Migration Sample M2 and, in 2016 and 2017 by M3, M4, M5 Refugee Samples. In the latest

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[9] Alongside the SOEP-Core, the family of studies includes SOEP-IS, i.e., the Innovation Sample, and several related studies SOEP-RS.

wave available for public use (SOEP-Core v37) additional migration samples are included, as well as the M6 2020 Asylum Seekers[10].

I used all waves from 1984 up to the most recent available one of 2020: to create the group of asylum seekers and refugees, I made use of the variable *biimgrp*, included in the bioimmig sub-dataset, which collects information about the respondent’s migration history. The variable codes immigration groups and makes a distinction between asylum seeker/refugee and other categories, i.e. Aussiedler, German living abroad, citizen of EU country and other foreigner. In my sample, definition of asylum seeker is extrapolated from this classification. Another, perhaps easier, identification strategy would have been to exploit the categories of sample membership: this variable allows to identify individuals who are part of the samples designed to increase representativeness of the migrant population. There are several of these ‘refreshment samples’, the first one starting from survey year 2013 and oversampling migrants living in Germany from 1995 (the M1 2013 Migration Sample); the most recent ones so far are the M6 and M7 2020 Refugee Sample. The reason why I chose to rely on the variable *biimgrp* to identify asylum seekers and refugees in the main dataset instead of relying on sub-sample classification lies mainly in the availability of health variables needed for my analysis. Many variables related to health or utilization of health services are not included in questionnaires for the years when the refugee samples are collected, therefore restricting the analysis to the years from 2016 onwards (when the first Refugee Sample is collected) would eliminate too many observations.

Next step in sample identification is to consider the restrictions in time of arrival and length of stay in Germany for asylum seeker to be still not covered by statutory health insurance. For this purpose, I restricted the sample of refugees to individuals whose length of stay (in months) falls within the

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[10] Additional information on the SOEP datasets, as well as sampling strategy and topics included, can be found within the content of Goebel et al. (2019) and Wagner et al. (2008).

scope of the period during which asylum seekers' health needs and entitlements are still regulated by the AsylbLG (1993). The exact length in months of this period has been subject to several amendments over the course of the past 30 years. I took into account the date of arrival in Germany and date of interview (in year and month format) to construct precise measurements of length of stay for asylum seekers in the sample, and discard everyone who had already exhausted their 'waiting period' when surveyed and whose health needs are administered within the scope of SSHI.

Table 3. Share of Asylum Seekers per Bundesland[11]

State of Residence	Asylum Seekers and Refugees		
	unrestricted, under SSHI	restricted	Total
[1] Schleswig-Holstein	1281	116	1397
	91.70	8.30	100.00
[2] Hamburg	625	77	702
	89.03	10.97	100.00
[3] Niedersachsen	3216	233	3449
	93.24	6.76	100.00
[4] Bremen	490	44	534
	91.76	8.24	100.00
[5] Nordrhein -Westfalen	6689	426	7115
	94.01	5.99	100.00
[6] Hessen	2778	156	2934
	94.68	5.32	100.00
[7] Rheinland-Pfalz	1219	80	1299
	93.84	6.16	100.00
[8] Baden-Württemberg	3454	364	3818
	90.47	9.53	100.00
[9] Bayern	3204	383	3587
	89.32	10.68	100.00
[10] Saarland	456	96	552
	82.61	17.39	100.00
[11] Berlin	1033	198	1231
	83.92	16.08	100.00
[12] Brandenburg	776	137	913
	84.99	15.01	100.00
[13] Mecklenburg-Vorpommern	299	38	337
	88.72	11.28	100.00
[14] Sachsen	679	104	783
	86.72	13.28	100.00
[15] Sachsen-Anhalt	569	74	643

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[11] Notes: Figures report in the first column the share of individuals who came to Germany as asylum seekers and were first surveyed in the SOEP as such; in the second column shares of individuals from my sample of interest, i.e., asylum seekers still not part of SSHI and facing restrictions in the scope of their welfare and health entitlements. First row has frequencies and second row has row percentages.

	88.49	11.51	100.00
[16] Thüringen	442	82	524
	84.35	15.65	100.00
Total	27210	2608	29818
	91.25	8.75	100.00

Table 3 shows the distribution of asylum-seeking individuals within Germany, whether they are either now covered by SSHI or still subject scope of application of the AsylbLG (1993). Table A.2 in the Appendix shows instead the main countries of origin of asylum seekers coming to Germany, keeping separate those whose legal determination procedure has been concluded and those under AsylblG. The final sample of asylum seekers and refugees exposed to the impact of HIC or HV for accessing health care services is made of 2,608 individuals out of the almost 30,000 refugees, after eliminating observations for which relevant variables were missing (state, district and municipality of residence). Out of this sample, those who are or have been subject to the HIC regime are 732 in total, with the remaining 1,876 living in a municipality where the only elected administrative mechanism for delivering health care services to the asylum-seeking population has always been the voucher. This implies that the level of observation for this variation is at municipal level: some municipalities are part of a district or a state where the local government reached an agreement with health insurance companies for covering the cost of the HIC, but then defer decisions on actual implementation to a lower level. I also eliminated from the sample asylum seekers living in a municipality where HIC was first introduced and then abandoned, namely the city of Wermelskirchen, Hattingen, Moers and Sprockhövel in North Rhein-Westphalia. The reasoning behind this choice is that such switch on-off of treatment status poses some methodological challenges beyond the scope of this analysis.

3.2 Variable Definition

The SOEP-Core questionnaires contain several questions related to either health outcomes of individuals and their incidence and frequency of utilization of different health care services. I kept in the analysis as dependents a measure of self-reported health based on a based on a 5-point scale ranging from Poor (0) to Excellent (4), as well as a 10-point measure of satisfaction with own health, again with Not Satisfied as the baseline (0). Two additional self-measures of health are included, with an indicator of whether the respondent is worried about their own health, with Not Worried as the baseline, and a variable indicating whether the individual experiences limitations in their daily activities due to health, again ranging from Not Limited to Very limited. As per measures of utilization of health services, I included in the analysis one dummy on whether the individual has been to the doctor at least once over the three months previous to the interview. The variable takes value 1 if a doctor visit occurred at least once, and 0 otherwise. Besides this measure of incidence of utilization of medical care (extensive margin), I included among the dependents the number of visits to a general practitioner, the number of days spent in hospital, and the number of nights of hospitalization (intensive margin)[12].

Table 4 synthetises the main health variables with their summary definition[13]. Most of these variables are not asked consistently over the years and, most importantly, are not always part of questionnaires for migration and refugee refreshment samples, hence a slightly more “complicated” process of sample definition that needed to identify individuals with history of migration and escape in all of the waves and could not rely entirely on the Refugee Sample. Some variables also required transformation for the purposes of this analysis, e.g. variables expressed as dummies but without a straightforward 0-1 coding in answers. All categorical variables on self-reported outcomes of health or feelings regarding health have been recoded so that the lowest numeric value (0) corresponds to the lowest category, be it ‘not healthy’, ‘not worried about health’, and so on. As for the dummy on

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[12] Again, the period over which the frequency of utilization of the service is measured is the past three months before interview for number of visits to GP and year previous to survey for number of stays and/or nights in the hospital.

[13] When transformation by the author occurred, the definition in Table 4 reports variable description as used in this analysis and not the one coded in the SOEP questionnaire.

incidence of visits to the GP, it is linked to its continuous counterparts on frequency of visits so that an answer different from 1 ’Yes, at least one visit’ is coded in SOEP datasets with the value -2 ‘not applicable’. For the purposes of my analysis, I recoded all these -2 as 0 in the dummy variable.

Table 4. Definition of Health Variables

Variable	Definition
Current health	How would you describe your current state of health?
Worried about health	How concerned are you about your health?
Limitations due to health	Have you been limited in your normal daily activities due to a health problem?
Satisfaction with health	How satisfied are you today with your health?
Dummy for doctor visits	Have you been to the doctor at least once over the last three months?
Number of doctor visits	Number of doctor visits in the last three months
Number of hospital stays	Number of stays in hospital (outpatient care) over the last year
Number of hospital nights	Number of nights in hospital (inpatient care) over the last year

4 Empirical Strategy

The aim of the analysis is to empirically assess whether refugees and asylum seekers who access health care services using an electronic insurance card (surrogate for statutory health insurance) differ in their use of medical services and their self-reported health outcomes from asylum seekers who uses the health voucher. Whether any significant effect detected of migration background on health and health service outcomes is truly the causal impact of immigrants depends, of course, on to what extent the model deals with any endogeneity bias caused by omitted variables, simultaneity, or selective in- or out-migration. To provide some preliminary answers to the issues of relative differences in use of health services between refugees in eHIC- and voucher-using Bundesländer, I estimate the eHIC effect for refugees excluded from statutory health insurance on the set of health service user outcomes discussed above in the context of the following simple model:

$$Y_{ibt} = \alpha + \beta(AS\&R_i{*}eHIC_b) + X'_{ibt}\vartheta + \mu_b + \lambda_t + \varepsilon_{ibt} \qquad (1)$$

where $AS\&R_i{*}eHIC_b$ is a dummy for being an asylum seeker whose length of stay in Germany since first entry has not yet exceeded the amount of time needed for being eligible for SSHI and who lives in a Bundesland where the electronic health insurance card (eHIC) is by time of interview the only mechanism implemented for health care services delivery to asylum seekers. The coefficient β is therefore the effect of interest, as it should capture significance and direction of any existing correlation between availability of eHIC and health outcomes for asylum seekers. The set of controls X_{ibt} includes age, sex, a dummy for marital status, number of dependent children in the household, a continuous variable for years of education (as proxy for educational qualification); a 5-scale categorical variable for fluency in oral German, ranging from 1 "Very good" to 5 "Non-speaking German"; a categorical variable indicating whether the respondent experienced a traumatic experience during their migration journey, e.g., fraud, sexual harassment, assault, shipwreck, robbery, incarceration or extortion. Alongside with covariates, Bundesland and year of interview dummies are included in the analysis, respectively μ_b and λ_t. The former should pick up any area-level differences in health service provision that may otherwise be correlated with immigrant residential concentrations, as well as control for characteristics of the Bundesland of residence such as unemployment rate and the share of immigrants. The latter controls for any state-invariant characteristics that may vary over time. Last, ε_{ibt} is an error term, where standard errors are clustered at individual level.

Differences in observed characteristics could of course underlie any differences in health service usage between asylum seekers using eHIC and those using the voucher if certain characteristics are associated with greater take-up or greater susceptibility to illness. This possibility would however be ruled out by the fact that refugees do not have the possibility to autonomously decide where to live for the first months (sometimes years) of their arrival in Germany and the length of this 'waiting period' has been crucial in constructing the sample of refugees affected by changes in health care delivery. Therefore, self-selection into a state where health care is delivered according to the individual's preferences seems unlikely to happen.

The dataset is an unbalanced panel. Individuals may refuse to participate in the interview for a variety of reasons or they may drop out of the sample because they move abroad. If the underlying processes determining health outcomes are correlated with those shaping the decision to participate in the sample or to move abroad then OLS estimates are inconsistent. If this systematic link between the two processes is constant over time, as are any or other unobservables that may affect the causal interpretation of the estimated immigration coefficients then fixed effects estimation eliminates the bias. If not, even fixed effects estimation yields unreliable parameter estimates. However fixed effects estimation is not an option when the variable of interest, being a refugee in a state with eHIC, is fixed over time. Pooled OLS (POLS) has been preferred over a random effects specification since the sample is not the same across all periods considered. By sample definition, asylum seekers who have been in the country for more than the 'waiting' period, or who have been granted refugee status, are not affected by policy change pertaining the introduction of eHIC and are therefore not part of the sample; also, as individuals keep on living in Germany longer than the period during which their rights are restricted, they are automatically dropped from the sample, since the delivery of medical services through eHIC or voucher does not affect them anymore. Hence, the natural comparison group for the interaction term of interest, AS&R*eHIC, is made up of AS&R whose scope of health entitlements is administered under the AsylbLG (1993) and who have been assign by means of the Königstein criterion to a Bundesland where the card was not introduced or fully implemented.

A possible confounder with this strategy could be imperfect compliance with the Königstein Key so that AS&R *do* have a margin in deciding where to live at moment of arrival in Germany and personal characteristics influencing their moving decisions could be correlated with their health outcomes. Table A.3 shows percentage rates of assigned and received shares of asylum seekers per states for the years 2015 to 2018 included (Giray Aksoy et al., n.d.) and it is evident that rates of divergence are never high. Also, one might argue that the decision to implement eHIC is not exogenous to a set of Bundesland-specific characteristics and, in cases where lower administration levels had the final say, on district- and city-specific characteristics. To condition out this risk for confoundedness, I include Bundesland fixed effects in the main specifications and run a series of robustness checks in later sections.

5 Descriptive Statistics

Table 5 reports average outcome and control variables used in the analysis by sub-samples (Natives, Asylum Seekers and Refugees benefiting from eHIC, and Asylum Seekers and Refugees using the voucher). The group of natives comprises individuals who were born in Germany and has no migratory background, interviewed in the period 1984-2020 and have no missing information in the key variables. Both groups of AS&R are approximately 36-37 years old at the time of interview, whereas natives in the sample tend to be on average older (around 47 years old). There is a higher percentage of men above women in the AS&R sub-samples, while the composition of natives appears more balanced. While there seems to be no stark difference for average marital status between natives and asylum seekers, the latter average household has a higher number of dependent children than the former. Natives spend more years in education than refugees, namely

12 versus approximately 9. As for dimensions of self-reported health, AS&R in both groups seem to converge on the same level satisfaction with health, but asylum seekers using eHIC report on average a higher score on the scale of how much they worry about their own health and how limited they feel in their daily activities because of poor health conditions and a lower score on their self-assessed level of general health. Differences persists in levels of utilization of health care services, as AS&R with the voucher indicate less visits to a general practitioner (GP) and a higher occurrence of inpatient and outpatient care than their counterpart in Bundesländer with eHIC. This preliminary evidence could support the hypothesis that the eHIC acts as a ‘surrogate’ for statutory health insurance, as patterns of utilization of health services for AS&R who have this resource tend to converge to those of natives. On the other side, those who have no other opportunity than the voucher tend to make less intensive use of primary or secondary care, as requesting the voucher is a stressful and invasive process (Claassen & Jäger, 2018c; Jäger et al., 2019c; Spura et al., 2017b).

Table 5. Descriptive statistics of demographic and health characteristics

	Natives	AS&R with eHIC	AS&R with voucher
Demographics			
Age	47.077	36.541	36.825
Sex	1.528	1.387	1.403
Marital status	2.024	2.010	1.931
No. children	2.07	3.167	3.134
Years in education	12.212	9.194	9.145
Self-reported health			
Current health	2.413	2.818	2.832
Worried about health	.85	.703	.684
Limitations due to health	.426	.287	.265
Satisfaction with health	6.707	7.538	7.56
Utilization of health services			
No. doctor visits	2.461	2.036	1.983
Been to the doctor at least once	.717	.889	.87
No. Hospital stays	.167	.057	.063
No. hospital nights	1.58	.268	.413

Figures A.1-A.8 give visual evidence of the trends in health outcomes and utilization of health for AS&R exposed to different mechanisms for health care delivery across all years considered in the sample (1984-2020). It can be noted how trends tend to converge for the timeframe that is most relevant for the analysis in terms of health policy variation, i.e. after 2010, when most of the agreement between Sickness Funds and Bundesländer governments took place. Scores on current state of health and satisfaction about health for AS&R in states with eHIC have a slight rise in 2016, when the card became effective in most states; similarly, scores for worry about health slightly decrease after 2016, and converges back to the other group's trend in the following years. Overall, the groups follow similar paths for the years when the eHIC was introduced and became effective in most districts and municipalities in Germany: in the main specification model, I will be looking at evidence on different health outcomes and health care utilization patterns produced when controlling for socio-demographic characteristics, as well as time-invariant Bundesland-specific features and time-variant information specific to the year of interview for each individual.

6 Results

Tables 4-5 report the results from estimation of Equation 1 (coefficients on the interaction term are on display). Table 4 illustrates results for the first set of dependent variables, all related to subjective assessment on the respondent's health and satisfaction with their state of health, whereas Table 5 shows estimated results for the dependents on utilization of health services, i.e., hospitalization and primary care. Not all variables present in the descriptive statistics have been used in the regression, due to availability of information across all waves. Regarding measures of utilization of health services, the variables with enough variability once restricted the sub-sample of analysis to AS&R within the 'waiting period' are: a dummy indicating incidence of GP visits, and two continuous variables for the number of days in outpatient care and the number of nights spent in inpatient care. In Table 4, coefficients of the interaction term, i.e. being an asylum seeker not covered by SSHI but with access to the electronic health insurance card instead of the voucher, show the relationship between the dependent variable of interest and the use of eHIC for asylum seekers excluded from SSHI. Overall, there seems to be a significant improve in self-assessed health of individuals subject to restrictions in terms of access to health services who have the possibility of eHIC for delivery of medical care. The same relation exists with regard to the coefficient on satisfaction about health, also positive and significant. When looking at the other columns, I observe a negative relation between exposure to the eHIC and probability of being worried about own health and experiencing limitations in daily life and activities due to health. The picture paint suggests that the eHIC could play a significant role in improving (self-assessed) state of health, increasing satisfaction and reducing struggles connected with health issues. This is in line with what previously suspected: eHIC eliminates the intermediation of home office bureaucracy in individuals' medical needs and health and makes it easier to access services whenever needed. This could have a double-faced effect. For once, individuals who have to wait for a voucher before getting access to the service they need might be deterred from asking because of language barriers, communication problems, lengthy processes and, as consequence, experience exacerbation of their health conditions before they are actually treated. Also, it might be the case that prompt and timely treatment makes the patient feel safe and content about the way their health needs are addressed and less worried about present or potential illnesses.

Table 4. Effect on Self-Reported Health

	(1) Current health	(2) Worried about own health	(3) Limitations due to health	(4) Satisfied with own health
AS&R in eHIC state (restricted access to health)	.256***	-.149***	-.11**	.623***
	(.078)	(.053)	(.043)	(.178)
Observations	2744	2731	2707	2743
R-squared	.149	.112	.116	.14
State Dummy	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES

Standard errors are in parentheses
****p<.01, **p<.05, *p<.1*

Table 5. Effects on Health Care Services Utilization

	(1) Been to the doctor at least once	(2) No. Hospital Stays	(3) No. Hospital Nights
AS&R in eHIC state (restricted access to health)	-.004	-.012**	-.058
	(.007)	(.005)	(.05)
Observations	8961	8961	8961
R-squared	.269	.087	.027
State Dummy	YES	YES	YES
Year Dummy	YES	YES	YES

Standard errors are in parentheses
****p<.01, **p<.05, *p<.1*

Table 5 show the coefficients of the interaction term for health care utilization dependents. The only significant effect can be found on the number of hospitalization (number of hospital stays in the three months prior to interview): being exposed to eHIC for asylum seekers for the first months of their stay is associated with a decreasing number of hospitalizations. A possible mechanism behind this effect could be that being able to access primary care timely and without intermediation has the effect of improving health of patients to the point where they resort less to emergency care. It is possible that facilitated access to preventive care plays a role in this. As for the other dependent variables, there is no evident effect: the coefficient associated to the interaction term is essentially null and not statistically significant. It is worth noting how the eHIC might have an effect on number of outpatient care but not on incidence of doctor visits or on number of nights spent at the hospital. It could be argued that facilitated access to health care would indeed reduce over-crowding of the emergency care sector, but the frequency of overnight hospitalization could be due to scheduled procedures, which depend less on the patient's choice of treatment rather than on their certified diagnoses and prescribed care. As far as GP services are concerned, incidence of visits to a doctor looks unaffected by different mechanisms for accessing care: perhaps a significant correlation would be visible in the frequency of visits but current available information on migrants' and refugees' health in the SOEP-Core dataset makes it impossible to longitudinally test this hypothesis at present.

Table 6. Effects on Health Care Services Utilization Conditioning on Health

	(1) Been to the doctor at least once	(2) No. Hospital Stays	(3) No. Hospital Nights
AS&R in eHIC state (restricted access to health	.003	-.009*	-.039
	(.008)	(.005)	(.052)
Observations	8950	8950	8950
R-squared	.284	.09	.03
State Dummy	YES	YES	YES
Year Dummy	YES	YES	YES

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*
Notes: The variable 'Current Health' has been added to the set of covariates used in previous specifications.

In Table 6, I ran the analysis with the same model (Equation 1) exclusively for the health care utilization indicators and I added the measure of current health status among the afore-mentioned covariates. The reason behind this is to control out any health difference that might be correlated with AS&R in eHIC states and to account for the (unlikely) hypothesis that asylum seekers in Bundesländer that implemented eHIC are systematically different in the way they perceive their state of health than those in Bundesländer that sticked to the voucher. Coefficients for the interaction term in Table 6 show how the direction of the effect remains the same as in the model without health controls, with the coefficient for the number of stays in hospital being the only significant one. The correlation is smaller now (from negative 0.012 to negative 0.009) but it still suggests that AS&R with eHIC have less tendency to receive outpatient care than AS&R who use the voucher with the same self-reported level of health. Again, this does not allow any conclusion on causal effects, but it reinforces the hypothesis that the eHIC is associated with lower frequency of hospital visits, possibly because of a better and more timely access to primary and preventive care.

7 Heterogeneity

In this section I consider potential heterogenous effects and attempt to identifying which groups experience the highest degree of correlation between exposure to eHIC as asylum seekers with restricted scope of health rights and health outcomes. More specifically, I investigate whether the effect that the introduction of eHIC has on asylum seekers is homogenous across gender or affects men and women differently. Understanding the potential different impact of health policy measures across genders is of great relevance in terms of policy making. In terms of health care, women are more exposed than men to policies regulating scope of access and entitlements, since they are primarily affected by anything that pertains pre-, peri- and post-natal care. Medical care for pregnancy and childbirth is among the services that are granted to asylum seekers under the scope of the Asylum Seekers Benefits Act, as it is considered one fundamental medical right. Granting easier access to prenatal as well as neonatal care in the form of avoiding the formal assessment of one’s health needs by home office bureaucrats could be positively correlated with more frequent visits to the doctor or with a higher incidence of specialistic visits during pregnancy and immediately after childbirth. In this sense, it is worth reminding how pregnant women and mothers are already often in a fragile and delicate position with regards to their personal physical and mental health, significantly more than men and even more so when subject to forced migration (Frank et al., 2021b;

Gewalt et al., 2019b).Despite the dearth of research dedicated to asylum-seeking women's specific health needs and outcomes (particularly in Germany), there is evidence on how men's and women's health determinants are potentially very different.

Table 7. Effect on Self-Reported Health by Gender

	(1) Current health		(2) Worried about own health		(3) Limitations due to health		(4) Satisfied with own health	
AS&R in eHIC state (restricted access to health)								
Male	.188*		-.128*		-.084		.508**	
	(.105)		(.072)		(.054)		(.235)	
Female		.307***		-.155*		-.128*		.69**
		(.117)		(.081)		(.069)		(.273)
Observations	1481	1263	1478	1253	1462	1245	1481	1262
R-squared	.111	.195	.077	.154	.059	.191	.098	.188
State Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES

Standard errors are in parentheses
****p<.01, **p<.05, *p<.1*

In order to understand more in depth the dynamics concerning the correlation between introduction of the card for accessing health services and individuals' rates of utilization of those services and their well-being, I split the sample by gender and evaluated results separately. Table 7 illustrates coefficients of the interaction term AS&R*eHIC for categorical self-assessed health and related variables: the direction and significance of the effects that was noticed for the whole sample persist, and the magnitude of such effects increase for the women sub-sample. Apparently, asylum seekers of female gender who have access to the eHIC tend to report levels of health even higher than their male counterparts. This is also valid for the other variables: women associated with eHIC utilization have the lowest values of worry about their own health and perceived limitations due to health and the highest score on satisfaction about their health.

Table 8. Effects on Health Care Services Utilization by Gender

	(1) Been to the doctor at least once		(2) No. Hospital Stays		(3) No. Hospital Nights	
AS&R in eHIC state (restricted access to health)						
Male	-.022**		-.005		.015	
	(.01)		(.006)		(.036)	
Female		.01		-.02**		-.129
		(.01)		(.009)		(.09)
Observations	4281	4680	4281	4680	4281	4680
R-squared	.338	.217	.075	.109	.053	.027
State Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

Standard errors are in parentheses
****p<.01, **p<.05, *p<.1*

Table 8 presents the picture for variables of utilization of medical services. Differently from the main specification, significant effects can be found on the incidence of visits to a GP: while for women there is a positive, albeit not significant, effect of eHIC, suggesting that the direction of this correlation is positive, men surprisingly experience a different effect. For the male sub-sample, being subject to eHIC is correlated with a decrease in probability that the respondent has ever requested GP services during the last year. As far as variables of hospitalization are concerned, we find again the same effect that was evident in the complete sample, i.e., eHIC associates with a decrease in days of outpatient care. However, it is clear now that this effect can be purely imputed to the women sub-sample.

8 Robustness Checks

So far, I have used panel data estimation techniques to investigate effects of introducing the electronic card for asylum seekers under the responsibility of the Bundesland’s government and their outcomes of health and use of medical services. Whether the effects discovered can be considered to be directly cause by the implementation of eHIC is a question that requires a more complex answer than the one the model in Equation 1 can provide. For once, even if the model includes a variety of controls at different levels to condition out any possible source of endogeneity bias, one important aspect to consider is whether decisions on introduction of eHIC and success or failure of its fully implementation are purely exogenous to federal states. It is likely that government decisions on whether to seek an agreement with local Sickness Funds to sustain costs of medical care for refugees and asylum seekers assigned to that Bundesland is highly correlated with state-level characteristics, such as public attitudes towards immigration and redistribution of health care services. To level out any bias deriving from this source of endogeneity, the model in Equation 1 includes state fixed effects. However, another issue concerns the level of implementation of eHIC, which differs from state to state as some governments took responsibility for implementation without exception within their geographical borders, whereas others delegated the possibility to do so to districts (Landkreise) or even municipalities (Gemeinden). Given this plurality of decision-making levels, state fixed effects in Equation 1 do not capture any endogeneity bias that could affect both the process of eHIC implementation and asylum seekers's situation and recipiency.

To increase robustness of my findings and proceed a step further in the direction of assessing causality, I first estimated the effect that district-specific characteristics have on eHIC introduction and implementation. Table 9 shows results of regressing a dummy taking value 1 if eHIC was ever factually implemented within a Landkreis and 0 if implementation never occurred on a series of district-level characteristics. Those are rate of unemployment, share of foreign residents, population density, area and population, and GDP per capita. All covariates are part of the SOEP-Core dataset and were accessible on site at Berlin DIW (Deutsches Institut für Wirtschaftsforschung) along with regional indicators, districts keys and municipalities postal codes. The coefficients are all strictly significant, indicating that district characteristics *do* play a role in whether the card becomes effective or not, even after the Bundesland government has concluded the necessary agreement and paved the way for actualization. However, the magnitude of each effect is overall hardly different from zero, suggesting that the actual effect might be negligible.

Table 9. Effect of KKZ-characteristics on Implementation of eHIC

	(1) eHIC introduction
Unemployment Rate (district level)	0**
	(0)
Share of Foreigners (district level)	-.002***
	(0)
Population Density (district level)	0***
	(0)
Area (district level)	0***
	(0)
Population (district level)	0***
	(0)
GDP per capita (district level)	0***
	(0)
Constant term	.022***
	(.002)
Observations	103938
R-squared	.099
State Dummy	YES
Year Dummy	YES

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Tables 10-11 show coefficients of the interaction term AS&R*eHIC from the same regression as in Equation 1, with only two differences from the main analysis. First, I remove state dummies and add the afore-mentioned district characteristics as covariates. Also, I drop from the sample individuals who live in a state where the decision on eHIC implementation was met at municipality-level: the reasoning behind this is that, for those states, district-level features hardly matter, since the district administrations were not involved in the final decision over the possibility of having the card introduced and the actual decision-makers have been municipality administrations.

Table 10. Effect on Self-Reported Health

	(1) Current health	(2) Worried about own health	(3) Limitations due to health	(4) Satisfied with own health
AS&R in eHIC state (restricted access to health)	.224***	-.154***	-.114**	.517***
	(.087)	(.06)	(.05)	(.199)
Observations	2250	2240	2218	2249
R-squared	.148	.107	.12	.139
KKZ covariates	YES	YES	YES	YES
KKZ Dummy	NO	NO	NO	NO
Year Dummy	YES	YES	YES	YES

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Notes: Bundesland Nordrhein-Westfalen has been excluded from this sample, since eHIC was introduced at municipality level.

Table 11. Effects on Health Care Services Utilization

	(1) Been to the doctor at least once	(2) No. Hospital Stays	(3) No. Hospital Nights
AS&R in eHIC state (restricted access to health)	-.005	-.015**	-.078
	(.009)	(.007)	(.061)
Observations	6739	6739	6739
R-squared	.263	.075	.022
KKZ covariates	YES	YES	YES
KKZ Dummy	NO	NO	NO
Year Dummy	YES	YES	YES

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Notes: Bundesland Nordrhein-Westfalen has been excluded from this sample, since eHIC was introduced at municipality level.

Coefficients maintain significance and direction as in the main specification and in some cases magnitude increases, providing confirmation of previous results. Another alternative specification is illustrated in tables A.4-A.5, where district fixed effects are used (alongside the usual year fixed effects). Also in this case, the main picture of effects of eHIC on health variables remains unchanged, with the only exception of coefficient on the variable on Limitations due to health, which is still positive but no longer significant.

9 What is Left to Learn?

The evidence provided so far proves that facilitated access to health care in the form of the health insurance card is positively associated with better self-reported health conditions, more satisfaction, less feelings of worry about one's own health and a decrease in perceived daily limitations due to health. Moreover, use of eHIC is associated with decreased frequency of outpatient care days. Those effects are validated by a set of further checks, whose findings support the claim that eHIC might play a causal role in the equation.

9.1 Long-Term Effects of eHIC on Use of Health Care

The question that follows is, then, the use of one rather than the other mechanism for accessing health care in the host country has any long-term repercussion for asylum seekers continuing to live in Germany. In other words, does the way asylum seekers first start to get access to medical services in the country of arrival shape future access practices and decisions? Does exposure to a limiting and constraining bureaucratic process pays a toll in terms of integration from the perspective of health care consumption? In principle, the eHIC is set to function as a perfect 'surrogate' for statutory health insurance: the only difference lies in who's paying the cost of health care for the patient but, other than that, there should be no barrier in access and no actual distinction between asylum seekers and fully-fledged citizens at point of use. The voucher, however, implies the intermediation of legal officers, constrains the patient to remain with the same public health care provider for the entire duration of the voucher's validity, often leads to delay in provision of care and discourages prompt seek of treatment, and foster discrimination and stigma of those using it. In addition to all this, is has been often pointed out how the sharing of medical information of an individual with administrative personnel who needs to make a decision about their request for health care represents a violation of the patient's right to privacy (Gottlieb & Schülle, 2021c). Hence, the question on whether such a traumatic experience in the host country shapes future health outcomes and health utilization patterns.

In the next sections, I seek an answer to the question of whether exposure to eHIC at arrival in Germany has long-term impact on AS&R patterns of utilization of health even after their status has been legalized and they benefit from SSHI as any other German citizen. I look at this question from to different perspectives: first, I examine the long-term effects on AS&R using eHIC for the first period of their stay in Germany as opposed to German natives; second, I observe the outcomes of AS&R with eHIC compared to the group of AS&R using the voucher. In the first case, I observe whether and to what extent the introduction of eHIC actually contributed to a swift assimilation of AS&R to natives from the point of view of access to health care. In the second case, I explore the different paths between asylum seekers who have benefited from access to care in a way most similar to natives from the very beginning of their stay in Germany and asylum seekers who were part of a separate system for access to medical services for the first months of their stay.

9.2 Empirical Strategy

To provide an answer to these questions, I take advantage of the variation in timing of introduction of eHIC across not only federal states but districts and municipalities as well. Table A.2 summarize detailed timelines of the spreading of eHIC in Germany: for every Bundesland where implementation of the new health policy was not regulated by the state government there are precise dates of eHIC introduction at district- and municipality-level. The picture looks extremely scattered: overall, after Bremen in 2005 and Hamburg in 2013, from 2016 onwards many states decided on full implementation within their scope of administration or concluded master agreements with Sickness Funds so that to allow districts (and municipalities) that wished so to proceed with actual implementation of the new delivery mechanism. Starting from January 2016, eHIC became a reality in many regions and cities, with the last one to introduce it being Dresden (Sachsen) in April 2020. This situation of 'staggered' introduction of the policy of interest presents a setting that hardly fits the traditional Difference-in-differences (DiD) method for estimating causal effects in non-experimental settings, since there are more than two periods and variation in treatment timing (Roth et al., 2022b). Since units are exposed to treatment (i.e., introduction of eHIC) at different moments in time, coefficients from the standard two-way fixed effects (TWFE) model do not represents a straightforward weighted average of treatment effects across all units. This happens due to the fact that TWFE regressions include in the analysis both 'clean' comparisons between treated and not-yet or never-treated units, but also 'forbidden' comparisons between units who are already treated at different points in time. When treatment effects are heterogenous across cohorts of treatment, these 'bad' comparisons could lead to severe drawbacks and problems for interpretation and inference[14]. Recent literature has proposed a variety of updated alternative estimators to overcome limitations of traditional TWFE regressions and identify and estimate true causal parameters under many sources of treatment effect heterogeneity (Borusyak et al., 2021; Callaway & Sant'Anna, 2021; Marcus & Sant'annaSant'Anna, 2021; Sun & Abraham, 2021; Goodman-Bacon et al., 2019; Strezhnev, 2018). These methodologies rely on relaxing baseline assumptions on treatment assignment and timing and generalization of the DiD approach to settings where treatment adoption is staggered. A common theme between all these new estimators is that they aim at isolating 'clean' counterfactuals between treated and/or not-yet or never-treated units, and then aggregate them using weights to estimate the parameter of interest.

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[14] One potential serious implication of applying TWFE estimation when treatment is heterogenous is the risk for TWFE coefficients to have the opposite sign of treatment effects because of negative weighting problems, hence posing issues for interpretation of the direction of effects (Callaway & Sant'Anna, 2021b; Sun & Abraham, 2021b).

I apply to this analysis the approach developed by Callaway & Sant'Anna (2021), which I now briefly summarize. The building block of their approach is the group-time average treatment effect on the treated:

$$ATT(g,t) = E\,[Y_{it}(g) - Y_{it}(\infty) \mid G_{it} = g] \quad (2)$$

where there are T periods indexed by $t = 1, 2, \ldots, T$, and units can receive treatment at any period[15]. If D_{it} indicates whether unit i receives treatment in period t, then $G_{it} = \{t : D_{it} = 1\}$ is the earliest period at which unit i has received treatment. If i never becomes treated, $G_{it} = \infty$. Given these premises, Equation 2 gives the average treatment effect at time t for the cohort first treated at time g. Intuitively, it is possible to produce estimations of $ATT(g,t)$ by comparing the expected change in outcome for cohort g between periods $g-1$ and t (observation time) to the change in a chosen control group of units which are either not-yet treated at time t or are never going to be treated over T. This approach presents the advantages of providing sensible parameters even under heterogenous treatment effects and it makes transparent which units are being used to build the control group (Roth et al., 2022b).

9.3 Sample Definition

I use a staggered DiD specification exploiting the quasi-experimental setting of the scattered implementation of eHIC across municipalities in Germany. The sample for this analysis looks different than the one in previous section of this paper. I built a sample of asylum seekers and refugees exposed to eHIC or voucher at moment of arrival in Germany using the information on the first place of residence they were registered at when first surveyed in the SOEP: here, residence at time of first contact with the SOEP is used as a proxy for first residence at time of arrival in Germany.

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[15] Crucial in the development of this estimator is that treatment is an 'absorbing state', i.e., it does not switch off and back on: once a unit becomes treated at time t', it stays so for all $t > t'$.

The reasoning behind this choice is the following: at arrival in Germany, asylum seekers are allocated through the afore-mentioned Königstein Key criteria across federal states, i.e. they are not able to choose their own place of residence according to personal preference. We can therefore assume that those who haven't relocated since arrival still live in the municipality (since the lowest level at which the decision to implement eHIC or stick to the voucher is implemented is municipal) where they have lived since first arrival and they are likely to find themselves in either one of the following situations: not covered by statutory health insurance because still in the 'waiting period', or recently fully insured. The assumption is that the effect of being exposed to the eHIC or the voucher persists in the short run, given that they shape the very first contact that the individual has with bureaucracy and health care system in the host country. For the purposes of this analysis, it is not feasible to use place of residence at first entry in Germany to single out AS&R who have been destined to a municipality, district or state with eHIC or voucher: despite the concept of 'first residence in Germany' being present in SOEP questionnaires, it has not been codified as a consistent variable in SOEP datasets.

9.4 Results

For this analysis, given the increase in number of observations available, I was able to make use of an additional continuous variable, i.e., the number of visits to a general doctor over the last three months before survey[16]. Moreover, I use the variables on frequency of hospitalization days and nights over the past year. The final sample consists of 22,429 treated individuals, i.e., those who came to Germany as asylum seekers and have been exposed to eHIC during their 'waiting period'

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[16] Inclusion of this new continuous variable is possible due to the increased number of observations in the sample.

outside of the SSHI umbrella. As in the sample for POLS, municipalities where eHIC was first introduced and then dismissed have been dropped out of the final sample[17].

In the following section, outcomes of the treated group are compared against German natives to look for assimilation patterns; next, they are compared against outcomes of the 5,811 individuals with asylum-seeking background who were only exposed to the voucher before becoming entitled to SSHI.

9.4.1 Long-Term Effects of eHIC: AS&R with eHIC vs. German Citizens

The main argument supporting the introduction of eHIC states that it favour the integration of asylum seekers and refugees into the host society by allowing them from the very beginning of their stay to access health care in a fashion similar to natives and does not put them through extraordinary bureaucratic measures to do so. Figures 2-4 illustrate the results of the staggered DiD analysis outlined in Section 9.2 on the sample of AS&R with eHIC as opposed to comparable German citizens for the outcomes of number of visits to the doctor, number of hospital stays and number of nights spent in the hospital. Tables A.6-A.8 show instead post-estimation summary of coefficients for all the variables: information includes average treatment effect over the whole estimation timeline, average of ATT for every year, average ATT aggregated over pre- and post-treatment periods. There seems to be no statistically significant difference between the outcomes of AS&R once they start being exposed to eHIC and those of natives. After introduction of eHIC in an asylum seeker's area of residence, their rates of utilization of primary care and outpatient care seems not to differ from those of natives and these results appear to persist on the long run. As the timeframe considered for the DiD analysis allows to look up until six years in the post-treatment period and the

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[17] Other approaches revisiting the standard DiD proposes estimators where treatment does not necessarily need to be an absorbing state (de Chaisemartin et al., 2019b; Imai & Kim, 2021b): this context, however, does not have enough observations switching on and off of treatment to justify the use of one of these estimation methods.

maximum length of the ‘waiting’ period before AS&R can be covered by SSHI has been four years, it is possible to infer that nothing changes in terms of utilization of health care between asylum seekers and German citizens once the former become fully eligible for statutory health insurance. Different is the case for accessing inpatient care, i.e., the number of nights spent in the hospital: here, it is possible to detect a slight statistically significant divergence in outcomes for AS&R and German individuals after the sixth post-treatment period. It is possible that newly legalized asylum seekers tend to be hospitalized overnight more frequently than comparable German natives: the reason behind this might be correlated with a rapid deterioration of asylum seekers’ health and a pattern of ‘unhealthy assimilation’, but a more detailed and precise answer would require an analysis dedicated to the issue.

To address the concern outlined in Section 9.3 about the fit of the proxy on relocation, I run the DiD analysis on two additional sample: the first considers relocation at district level and the second maintain relocation at state level. Results shown in figures A.9-A.14 are in line with what observed in the analysis with the full sample.

Figure 2. ATT of Number of Doctor Visits Over the Past Three Months

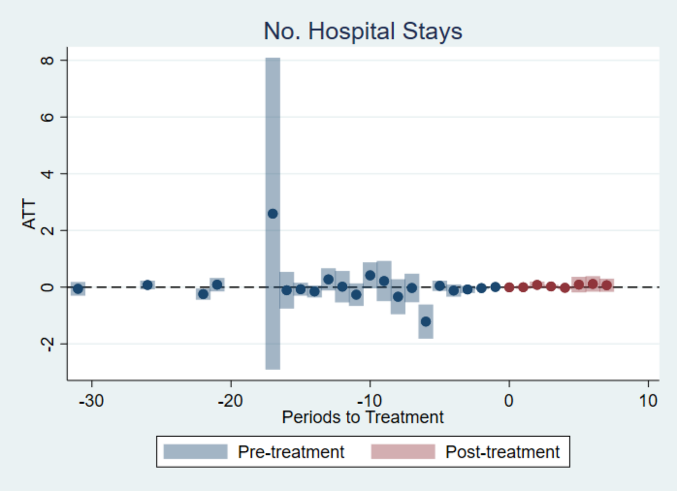


Figure 3. ATT of Number of Hospital Stays Over the Past Year

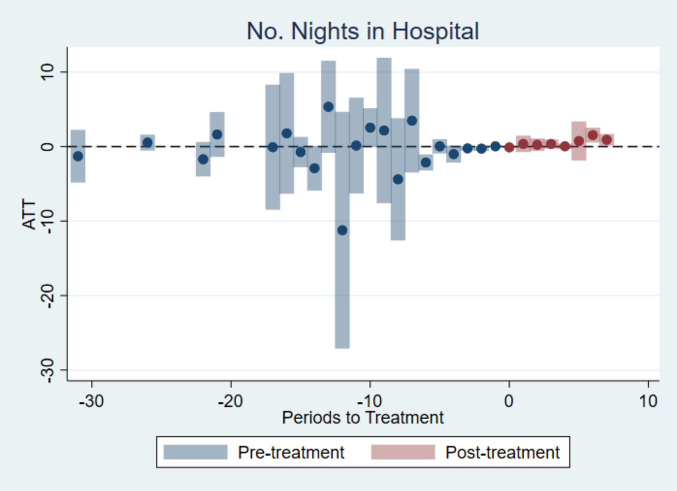
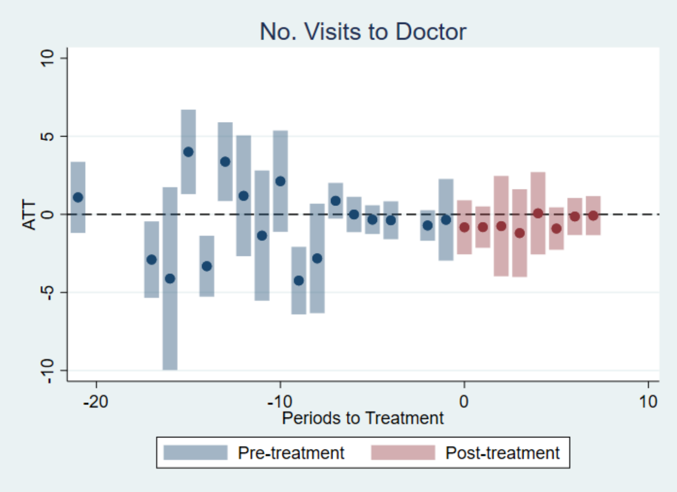


Figure 4. ATT of Number of Hospital Nights Over the Past Year



9.4.2 Long-Term Effects of eHIC: AS&R with eHIC vs. AS&R with Voucher

Figures 5-7 plot the average treatment effect estimated through staggered DiD across time. It can be noticed how not all years have an estimated ATT, and this is due to the availability of enough control units in the periods. In this specification, individuals surveyed before 2004 have been dropped off the sample to increase the power of the analysis: since the first treated observations become so in 2005, 2004 is the first control period when no one has been treated yet. I use not-yet treated units as counterfactuals and cluster standard errors at individual level. Tables A.9-A.11 summarize the relative post-estimation summary. The only variables for which there is a clear visible long-term effect is the one on frequency of hospital stays: after five periods from treatment[18], there is a significant positive effect on intensity of outpatient care utilization. This seems to conflict with previous findings using POLS estimation method, where results indicated that use of eHIC was negatively correlated with number of hospital stays. As mentioned in previous sections of this paper, the length of the period during which asylum seekers face restrictions in health care entitlements and cannot be part of SSHI has been subject to several amendments: however, since 2004, which is the time period considered here, it was never longer than four years. The effect that the model picks up hence only affects individuals who are enjoying full rights under statutory health insurance: exposure to eHIC is associated with less use of outpatient care for asylum seekers while they are still excluded from SSHI but leads to higher rates of hospital stays once they are fully members of SSHI. As for the other variables, despite some fluctuations, ATT are never strictly significant in any post-treatment periods.

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[18] Treatment in this case being first exposure to eHIC for asylum seekers who are not yet covered by SSHI.

Figure 5. ATT of Number of Doctor Visits Over the Past Three Months

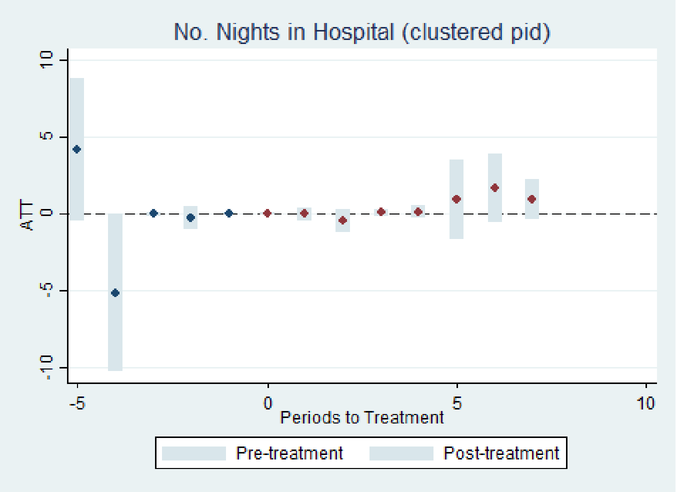


Figure 6. ATT of Number of Hospital Stays Over the Past Year

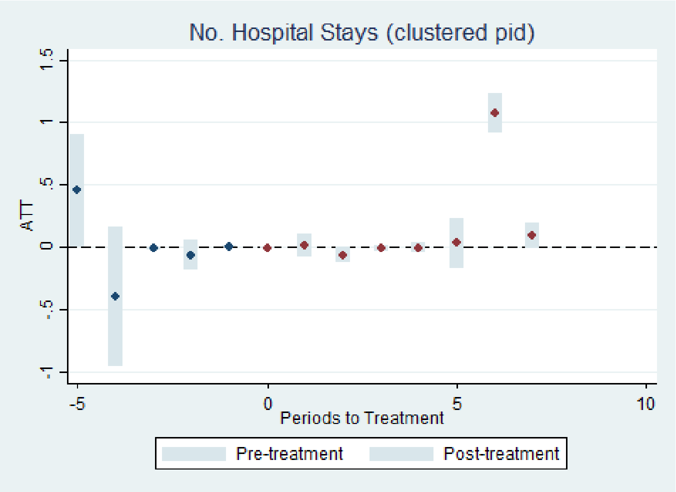
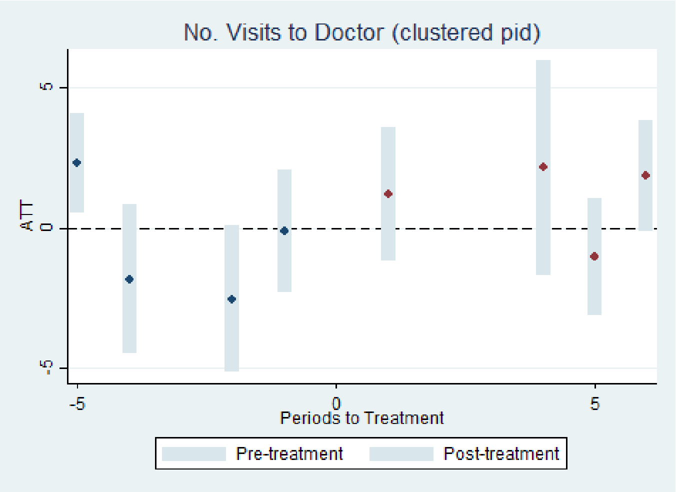


Figure 7. ATT of Number of Hospital Nights Over the Past Year



10 Conclusion

This paper aims at contributing to the literature concerning regulations of access to health care for fragile categories and the repercussions of health policies design on health inequalities. I exploit a time and geographical variation in introduction of a new administrative tool for the handle of access to medical services for asylum seekers and refugees in Germany, namely the electronic health insurance card which was conceived as an alternative to the existing voucher. Despite evidence of the inefficiencies and dubious ethical grounds of the voucher, several states and districts in Germany refused to replace it with the card and stuck to the existing method. Overall, between 2005 and 2020, eHIC for AS&R has been comprehensively introduced in five states and partially in five others.

Despite the focus in health and migration literature on the German context (Müllerschön et al. 2019, Jäger et al. 2019, Wenner et al. 2020), little has been done so far exploiting the quasi-experimental design of AS&R allocation across federal states. I investigate the association between exposure to the eHIC and outcomes of self-reported health and utilization of health care services for asylum seekers using data from the SOEP survey. Using pooled OLS estimation for a preliminary analysis, I found positive correlation between eHIC and higher self-assessed levels of health and satisfaction with health, as well as negative correlation between use of the card and the degree to which the respondent feels limited in their life due to health and worry about their health. The results suggest that eHIC could play a significant role in improving (self-assessed) state of health, increasing satisfaction and reducing struggles connected with health issues. This is in line with what has so far been suspected: eHIC eliminates the intermediation of home office bureaucracy in individuals' medical needs and health and makes it easier to access services whenever needed. This could have a double-faced effect. For once, individuals who have to wait for a voucher before getting access to the service they need might be deterred from asking because of language barriers, communication problems, lengthy processes and, as consequence, experience exacerbation of their health conditions before they are actually treated. Also, it might be the case that prompt and timely treatment makes the patient feel safe and content about the way their health needs are addressed and less worried about present or potential illnesses. The empirical analysis also found evidence that use of eHIC is significantly associated with a decrease in number of hospital stays, suggesting a shift in care services that individuals access when using eHIC rather than the voucher. A possible mechanism behind this effect could be that lower bureaucratic constrains and intermediation facilitates timely primary care treatment and this in turn improves the health of patients to the point where they resort less to emergency care. It is possible that facilitated access to preventive care plays a role in this. As for the other dependent variables, there is no significant effect: the coefficient associated to the interaction term is essentially null and not statistically significant. However, it is worth noticing how the sign of the correlation with inpatient care (number of hospital nights) is negative as well, despite not being statistically significant. Again, the interpretation behind the direction of this correlation might be that accessing health care without intermediation could be negatively associated also with frequency of resorting to inpatient care. Possible reasons for the coefficient not being statistically significant could either be imputed to the small scale of the sample or to the nature of the variable per se: although it could be argued that facilitated access to health care would indeed reduce over-crowding of the emergency care sector, the frequency of overnight hospitalization could be due to scheduled procedures, which depend less on the patient's choice of treatment rather than on their certified diagnoses and prescribed care. As far as GP services are concerned, incidence of visits to a doctor looks unaffected by different mechanisms for accessing care (coefficient is negative and not significant): perhaps a significant correlation would be visible in the frequency of visits but current available information on migrants' and refugees' health in the SOEP-Core dataset makes it impossible to longitudinally test this hypothesis at present. However, when controlling for state of health among the covariates, the coefficient associated with incidence of primary care visits become positive, even if still non-significant: the direction confirms the evidence in existing literature that facilitating access for vulnerable patients increases incidence of treatment. In the attempt to establish whether such associations between variables can be imputed to a causal effect of eHIC, I run the same POLS regression on a restricted sub-sample of observations, where district (Kreise) fixed effects could be included. Here I was able to control for any district characteristic possibly affecting the decision on implementation or dismissal of eHIC. The coefficients of this regression are virtually identical in magnitude, direction and significance to the ones in the previous specification.

A further step was to consider a larger sample of individuals who are either AS&R excluded from SSHI or recently legalized, and to analyse whether exposure to eHIC at the moment of first access to health care in Germany somehow significantly shapes their long-term utilization of the health care system. Using an innovative staggered Difference-in-differences design, I found evidence of significant effects concerning frequency of hospital stays and no significant effect for number of nights spent at the hospital (inpatient care). It seems that access to health care through eHIC translates with an increased number of hospital stays for asylum seekers once they benefit from SSHI, possibly explained by more familiarity of eHIC-users with the German medical system and its accessibility. This result support the evidence in literature that experience in the destination country is one crucial factor that may significantly affect health patterns: evidence on physical and mental health outcomes suggest that there is overall a penalty for migrants, and that the magnitude of their disadvantage in access and use of health care varies depending on time spent in the host country (Jayaweera 2014, Jayaweera and Quigley 2010). When comparing AS&R utilization of health care with that of German citizens, evidence shows that AS&R who benefited from eHIC for the first months of their residence in Germany are not different from natives in their utilization of outpatient care but do tend to make more use of inpatient care and be hospitalized overnight more frequently.

The reason behind this might be explained by rapid deterioration of asylum seekers' health and a pattern of 'unhealthy assimilation' to the health conditions of natives (Giuntella and Stella 2017, Constant et al. 2018), but a more detailed and precise answer would require an analysis dedicated to the issue. Overall, though it seems to be the case that eHIC reduces inequalities in access to care between AS&R and German natives, a large cohort of vulnerable individuals is left behind in those states where the card did not reach operational capacity, thus generating a new layer of inequality in access to health care services.

Overall, these results represent a contribution to the increasing empirical literature addressing the topic of the effects of policies regulating migrant access to care and welfare. These results are in line with previous findings on the positive effects that participation in public welfare programs and insurance coverage have on the health of vulnerable migrants (Sommers, Gawande, and Baicker 2018) . Many empirical studies in the existing literature on health and migration provide evidence that migrants' health is not necessarily inherently worse than natives' and proves instead to be better at moment of arrival in the destination country (Constant et al. 2018). However, there is still less consensus on the medium- and long-term course of migrants' health as years go by. It has been widely recognized that poor socio-economic conditions, spatial segregation and social exclusion from natives contribute to rapid deterioration of health of migrants and asylum seekers (Giannoni, Franzini, and Masiero 2016). Other studies focus instead on the role of integration policies designed and implemented in the host countries and their responsibility in shaping health trajectories of migrant communities. Legal barriers and the restricted entitlement to fundamental rights, as is the case in many European states, remain a crucial obstacle in fostering good health and appropriate utilization of care from non-natives, especially vulnerable migrants. The World Health Organization (WHO) speaks in this sense of 'institutional discrimination', an indirect or passive form of discrimination that does not entail deliberate acts by individuals but results instead from a certain structure of institutions that are designed for one group and create disadvantages for others (WHO 2010). In a homogenous society that becomes gradually multi-ethnic and multicultural as it opens to newcomers, institutional discrimination is the inevitable result of institutions that are designed to best accommodate natives' preferences. It needs to become adjusted to the new multi-layered reality, especially as migrants, refugees and asylum seekers seek to become members of the society, as to facilitates integration and not exacerbate inequalities. Host societies and governments are mostly concerned about the impact that extending social and health rights to newcomers might have on the provision of welfare for natives and the resilience of existing structures, as proven by several strands of empirical research that aims at addressing this concern. (Giuntella and Nicodemo et al. 2015, Giuntella et al. 2019, Sunyaev et al. 2009). The analysis of the direct effects of differently designed integration policies on migrants, especially refugees and asylum seekers, remain still largely understudied and is worth exploring, particularly in the aftermath of a global health crisis such as the COVID-19 pandemic, which shed light on the inadequacies of Western welfare states and health systems in dealing with inequalities in access and delivery of care (Okonkwo et al. 2021).

The message conveyed by the results from this empirical analysis are inherently linked to the geographical context and does not necessarily hold for other groups of mi-grants in other receiving countries. Nonetheless, it constitutes a valid empirical contribution to the literature exploring effects of health policy on vulnerable migrants and a first attempt to estimate the overall effect of introduction of eHIC in Germany. Further research in this direction could aim at providing insight on the impact of eHIC on AS&R objective physical and mental health conditions, as well as verifying the short- and long-term effects on their rates of utilization of primary and secondary health care after legalization of their status.

Appendix

Table A.1. Details of eHIC introduction per Bundesland

State	**eHIC introduced at state level**	**districts with eHIC**	**municipalities with eHIC**	**Date of introduction**
Schleswig-Holstein	yes	All	All	January 2016
Hamburg	yes	Freie und Hansestadt Hamburg		July 2012
Niedersachsen	no		Delmenhorst	June 2016
			Cuxhaven	January 2019
			Burgwedel	January 2018
Bremen	yes	Bremerhaven		2005
		Hansestadt Bremen		2005
Nordrhein-Westfalen	no		Bonn	January 2016
			Bochum	January 2016
			Gevelsberg	January 2016
			Mohnheim	January 2016
			Mühlheim an der Ruhr	January 2016
			Leichlingen	January 2016
			Wermelskirchen	January 2016
			Alsdorf	January 2016
			Bocholt	January 2016
			Köln	January 2016
			Münster	January 2016
			Wetter	January 2016
			Dülmen	April 2016
			Düsseldorf	April 2016
			Hattingen	April 2016
			Herdecke	April 2016
			Moers	April 2016
			Oberhausen	April 2016
			Remscheid	April 2016
			Sprockhövel	April 2016
			Möchengladbach	July 2016
			Hennef	January 2017
			Troisdorf	January 2017
			Bornheim	January 2017
			Recklinghausen	January 2019
Hessen	no			
Rheinland-Pfalz	no	Trier		January 2017

		Mainz		July 2017
		Kusel		July 2017
Baden-Württemberg	no			
Bayern	no			
Saarland	no			
Berlin	yes	Berlin		2016
Brandenburg	no	Barnim		February 2017
		Brandenburg an der Havel		April 2017
		Cottbus		January 2017
		Dahme-Spreewald		January 2017
		Elbe-Elster		October 2017
		Frankfurt (Oder)		February 2017
		Havelland		January 2017
		Oberhavel		October 2016
		Oberspreewald-Lausitz		October 2017
		Oder-Spree		April 2017
		Ostprignitz-Ruppin		January 2019
		Potsdam		July 2016
		Potsdam-Mittelmark		January 2017
		Prignitz		April 2017
		Spree-Neiße		January 2018
		Teltow-Fläming		September 2016
		Uckermark		February 2017
Mecklenburg-Vorpommern	no			
Sachsen	no		Dresden	April 2020
Sachsen-Anhalt	no			
Thüringen	yes	All		2017

Table A.2. Asylum Seekers in Germany by Country of Origin

macro_area	Asylum Seekers and Refugees		
	unrestricted, under SSHI	restricted, under HIC/HV	Total
Syria	11226	1443	12669
	88.61	11.39	100.00
Irak	3124	422	3546
	88.10	11.90	100.00
Afghanistan	2539	286	2825
	89.88	10.12	100.00
Eritrea	1097	92	1189
	92.26	7.74	100.00
Iran	927	64	991
	93.54	6.46	100.00
Somalia	379	41	420
	90.24	9.76	100.00
Pakistan	356	39	395
	90.13	9.87	100.00
Nigeria	289	26	315
	91.75	8.25	100.00
Russland	569	22	591
	96.28	3.72	100.00
Albania	232	20	252
	92.06	7.94	100.00
Serbia	414	16	430
	96.28	3.72	100.00
Lebanon	337	12	349
	96.56	3.44	100.00
Gambia	81	10	91
	89.01	10.99	100.00
Other	4902	113	5015
	97.75	2.25	100.00
Total	26472	2606	29078
	91.04	8.96	100.00

Notes: First row has frequencies, second row has row percentages.

Table A.3. Received versus Assigned Percentage Shares of Asylum Seekers per Bundesland

	2015		2016		2017		2018	
	Received	Assigned	Received	Assigned	Received	Assigned	Received	Assigned
Baden-Württemberg	13.0	12.9	11.7	13.0	10.8	13.0	9.9	13.0
Bayern	15.3	15.5	11.4	15.5	12.2	15.6	13.5	15.6
Berlin	7.5	5.0	3.8	5.1	4.7	5.1	5.1	5.1
Brandenburg	4.2	3.1	2.5	3.0	2.8	3.0	2.9	3.0
Bremen	1.1	1.0	1.2	1.0	1.3	1.0	1.3	2.0
Hamburg	2.8	2.5	2.4	2.6	2.4	2.6	2.6	2.6
Hessen	6.2	7.4	9.1	7.4	7.4	7.4	8.0	7.4
Niedersachsen	7.8	9.3	11.5	9.3	9.5	9.4	10.4	9.4
Mecklenburg-Vorpommern	4.3	2.0	1.0	2.0	2.0	2.0	1.7	2.0
Nordrhein-Westfalen	15.1	21.2	27.2	21.1	26.9	21.1	24.4	21.1
Rheinland-Pfalz	4.0	4.8	5.1	4.8	6.5	4.8	4.7	4.8
Saarland	2.3	1.2	1.0	1.2	1.6	1.2	1.7	1.2
Sachsen	6.2	5.1	3.3	5.1	3.7	5.0	4.7	5.0
Sachsen-Anhalt	3.7	2.8	2.7	2.8	2.6	2.8	2.6	2.8
Schleswig-Holstein	3.5	3.4	4.0	3.4	3.1	3.4	4.0	3.4
Thüringen	3.0	2.7	2.1	2.7	2.5	2.7	2.6	2.7
.	0.0	.	0.0	.	0.1	.	0.1	.

Notes: The table is taken from Giray Aksoy et al. (n.d.), who used resources from BAMF (2014-2019)

Table A.4. Effect on self-reported health: only states with eHIC at kkz level and kkz fixed effects

	(1) Current health	(2) Worried about own health	(3) Limitations due to health	(4) Satisfied with own health
AS&R in eHIC state (restricted access to health)	.228**	-.141**	-.089	.487**
	(.095)	(.063)	(.054)	(.219)
Observations	2250	2240	2218	2249
R-squared	.238	.204	.19	.226
KKZ Dummy	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Table A.5. Effects on health care services utilization: only states with eHIC at kkz level wth kkz fixed effects

	(1) Been to the doctor at least once	(2) No. Hospital Stays	(3) No. Hospital Nights
AS&R in eHIC state (restricted access to health)	.002	-.015**	-.05
	(.008)	(.008)	(.077)
Observations	6737	6737	6737
R-squared	.313	.121	.043
KKZ Dummy	YES	YES	YES
Year Dummy	YES	YES	YES

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Table A.6. Post-Estimation Summary ATT for Number of Doctor Visits. AS&R with eHIC vs. German Natives

	(1)	(2)	(3)
ATT	-0.573		
	(0.877)		
CAverage		-0.648	
		(0.748)	
T2013		-0.829	
		(0.884)	
T2014		-0.248	
		(0.555)	
T2017		-1.087	
		(1.231)	
T2018		-0.796	
		(1.204)	
T2019		-0.861	
		(1.009)	
T2020		-0.0709	
		(1.277)	
Pre_avg			-0.464*
			(0.214)
Post_avg			-0.582
			(0.648)
Tm21			1.088
			(1.162)
Tm17			-2.897*
			(1.249)
Tm16			-4.114
			(2.987)
Tm15			4.003**
			(1.381)
Tm14			-3.320***
			(0.996)
Tm13			3.375**
			(1.287)

Tm12	1.188
	(1.973)
Tm11	-1.358
	(2.127)
Tm10	2.125
	(1.655)
Tm9	-4.242***
	(1.104)
Tm8	-2.821
	(1.789)
Tm7	0.870
	(0.584)
Tm6	-0.00710
	(0.578)
Tm5	-0.338
	(0.470)
Tm4	-0.378
	(0.619)
Tm2	-0.711
	(0.499)
Tm1	-0.348
	(1.334)
Tp0	-0.829
	(0.884)
Tp1	-0.816
	(0.676)
Tp2	-0.752
	(1.639)
Tp3	-1.199
	(1.434)
Tp4	0.0703
	(1.345)
Tp5	-0.908
	(0.693)
Tp6	-0.137
	(0.606)

```
Tp7                                      -0.0812
                                         (0.638)
------------------------------------------------------------
N
------------------------------------------------------------
Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001
```

Table A.7. Post-Estimation Summary ATT for Number of Hospital Stays. AS&R with eHIC vs. German Natives

```
------------------------------------------------------------
                 (1)            (2)            (3)

------------------------------------------------------------
ATT           0.0141
            (0.0192)

CAverage                     0.0651
                           (0.0681)

T2013                         0.209
                            (0.404)

T2014                         0.107
                            (0.109)

T2015                         0.119
                            (0.111)

T2016                       0.00369
                           (0.0139)

T2017                       -0.0110
                           (0.0180)

T2018                        0.0258
                           (0.0496)

T2019                        0.0905
                           (0.0640)

T2020                       -0.0237
                           (0.0174)

Pre_avg                                      0.0486
                                            (0.143)

Post_avg                                     0.0431
                                           (0.0517)
```

Tm31	-0.0584
	(0.124)
Tm26	0.0766
	(0.0781)
Tm22	-0.245*
	(0.102)
Tm21	0.0872
	(0.122)
Tm17	2.592
	(2.806)
Tm16	-0.109
	(0.330)
Tm15	-0.0722
	(0.117)
Tm14	-0.151
	(0.108)
Tm13	0.275
	(0.200)
Tm12	0.0164
	(0.283)
Tm11	-0.264
	(0.203)
Tm10	0.417
	(0.234)
Tm9	0.216
	(0.362)
Tm8	-0.338
	(0.315)
Tm7	-0.0280
	(0.257)
Tm6	-1.215***
	(0.308)
Tm5	0.0467
	(0.0932)
Tm4	-0.120
	(0.111)

Tm3	-0.0805
	(0.0655)
Tm2	-0.0330
	(0.0188)
Tm1	0.00651
	(0.00806)
Tp0	-0.00656
	(0.0101)
Tp1	-0.00266
	(0.0291)
Tp2	0.0803
	(0.0601)
Tp3	0.0253
	(0.0300)
Tp4	-0.0221
	(0.0248)
Tp5	0.0886
	(0.141)
Tp6	0.114
	(0.140)
Tp7	0.0681
	(0.119)
N	

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table A.8. Post-Estimation Summary ATT for Number of Hospital Nights. AS&R with eHIC vs. German Natives

	(1)	(2)	(3)
ATT	0.198		
	(0.174)		
CAverage		0.524	
		(0.293)	
T2013		0.423	

	(1.851)	
T2014	1.589***	
	(0.347)	
T2015	1.350***	
	(0.385)	
T2016	0.131**	
	(0.0425)	
T2017	0.309	
	(0.530)	
T2018	-0.0904	
	(0.570)	
T2019	0.573	
	(0.395)	
T2020	-0.0960	
	(0.145)	
Pre_avg		-0.397
		(0.516)
Post_avg		0.513
		(0.281)
Tm31		-1.296
		(1.807)
Tm26		0.536
		(0.547)
Tm22		-1.697
		(1.181)
Tm21		1.626
		(1.536)
Tm17		-0.0850
		(4.283)
Tm16		1.777
		(4.137)
Tm15		-0.736
		(1.039)
Tm14		-2.907
		(1.532)
Tm13		5.341

	(3.155)
Tm12	-11.23
	(8.110)
Tm11	0.134
	(3.284)
Tm10	2.539
	(1.334)
Tm9	2.162
	(4.983)
Tm8	-4.395
	(4.190)
Tm7	3.480
	(3.553)
Tm6	-2.132***
	(0.551)
Tm5	0.0339
	(0.492)
Tm4	-1.009
	(0.582)
Tm3	-0.242
	(0.143)
Tm2	-0.274
	(0.154)
Tm1	0.0361
	(0.0498)
Tp0	-0.106
	(0.0578)
Tp1	0.361
	(0.565)
Tp2	0.247
	(0.430)
Tp3	0.355
	(0.311)
Tp4	0.0416
	(0.183)
Tp5	0.748

```
                         (1.337)

Tp6                        1.542**
                         (0.508)

Tp7                        0.916*
                         (0.402)
------------------------------------------------------------
N
------------------------------------------------------------
Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001
```

Table A.9. Post-Estimation Summary ATT for Number of Doctor Visits. AS&R with eHIC vs. AS&R with voucher

```
------------------------------------------------------------
                 (1)          (2)          (3)

------------------------------------------------------------
ATT            0.930
             (0.927)

CAverage                    1.047
                          (0.890)

T2014                       1.202
                          (1.216)

T2017                       2.150
                          (1.966)

T2018                      -1.034
                          (1.059)

T2019                       1.871
                          (1.021)

Pre_avg                                   -0.537
                                        (0.567)

Post_avg                                   1.047
                                        (0.890)

Tm5                                        2.311*
                                        (0.908)

Tm4                                       -1.819
                                        (1.360)

Tm2                                       -2.539
                                        (1.329)
```

Tm1	-0.101
	(1.114)
Tp1	1.202
	(1.216)
Tp4	2.150
	(1.966)
Tp5	-1.034
	(1.059)
Tp6	1.871
	(1.021)
N	

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table A.10. Post-Estimation Summary ATT for Number of Hospital Stays. AS&R with eHIC vs. AS&R with voucher

	(1)	(2)	(3)
ATT	-0.00346		
	(0.0129)		
CAverage		0.0470*	
		(0.0186)	
T2014		0.215***	
		(0.0483)	
T2015		0.159***	
		(0.0450)	
T2016		0.0188***	
		(0.00508)	
T2017		-0.00378	
		(0.0114)	
T2018		0.0318	
		(0.0800)	
T2019		-0.0527	
		(0.0360)	

T2020	-0.0395***
	(0.0103)
Pre_avg	-0.00205
	(0.0445)
Post_avg	0.142***
	(0.0273)
Tm5	0.453*
	(0.231)
Tm4	-0.397
	(0.287)
Tm3	-0.00807
	(0.00467)
Tm2	-0.0611
	(0.0625)
Tm1	0.00296
	(0.00291)
Tp0	-0.00644*
	(0.00303)
Tp1	0.0170
	(0.0455)
Tp2	-0.0650*
	(0.0316)
Tp3	-0.00837
	(0.0107)
Tp4	-0.00421
	(0.0184)
Tp5	0.0321
	(0.101)
Tp6	1.079***
	(0.0813)
Tp7	0.0941
	(0.0531)
N	

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table A.11. Post-Estimation Summary ATT for Number of Hospital Nights. AS&R with eHIC vs. AS&R with voucher

	(1)	(2)	(3)
ATT	-0.0569		
	(0.0999)		
CAverage		0.391	
		(0.202)	
T2014		2.090**	
		(0.691)	
T2015		1.329*	
		(0.583)	
T2016		0.133*	
		(0.0541)	
T2017		-0.0205	
		(0.167)	
T2018		-0.0326	
		(0.344)	
T2019		-0.529	
		(0.450)	
T2020		-0.234*	
		(0.109)	
Pre_avg			-0.289
			(0.192)
Post_avg			0.360
			(0.364)
Tm5			4.130
			(2.350)
Tm4			-5.194*
			(2.615)
Tm3			-0.0815
			(0.0674)

Tm2	-0.302
	(0.369)
Tm1	0.00425
	(0.0157)
Tp0	-0.0708
	(0.0407)
Tp1	-0.0785
	(0.203)
Tp2	-0.500
	(0.396)
Tp3	0.0359
	(0.115)
Tp4	0.0798
	(0.219)
Tp5	0.873
	(1.328)
Tp6	1.651
	(1.145)
Tp7	0.887
	(0.671)
N	

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Figure A.1. Average Current Health for AS&R in eHIC State vs AS&R in voucher state

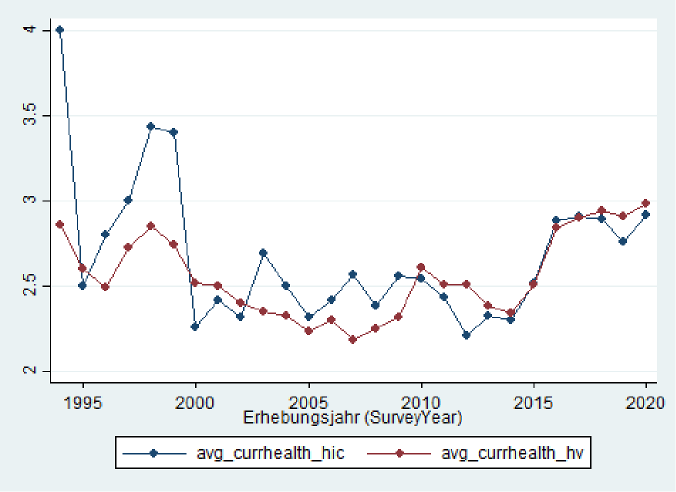


Figure A.2. Average Satisfaction with Health for AS&R in eHIC State vs AS&R in voucher state

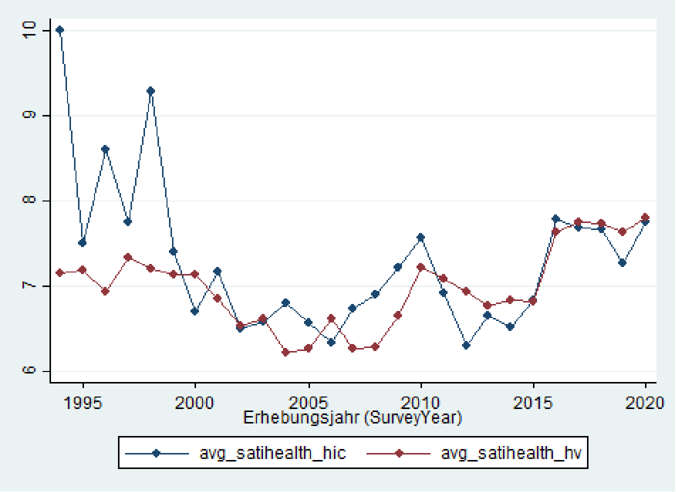


Figure A.3. Average Worry about Health for AS&R in eHIC State vs AS&R in voucher state

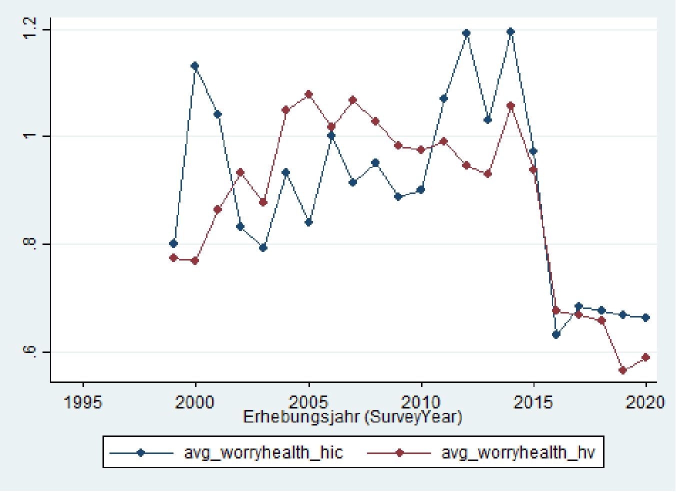


Figure A.4. Average Limitations due to Health for AS&R in eHIC State vs AS&R in voucher state

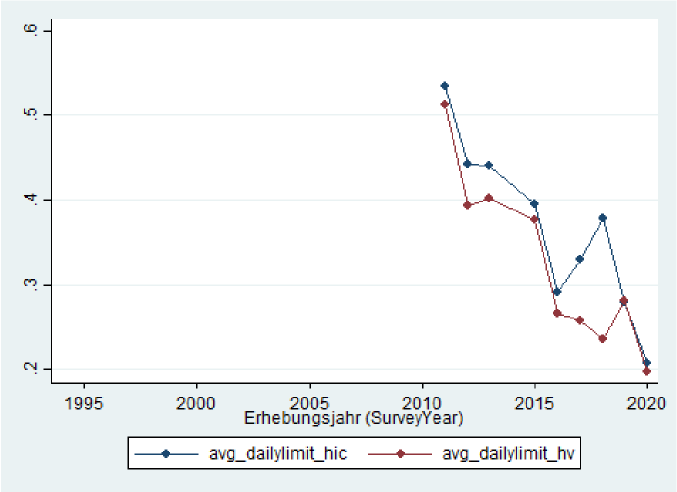


Figure A.5. Average No. Doctor Visits for AS&R in eHIC State vs AS&R in voucher state

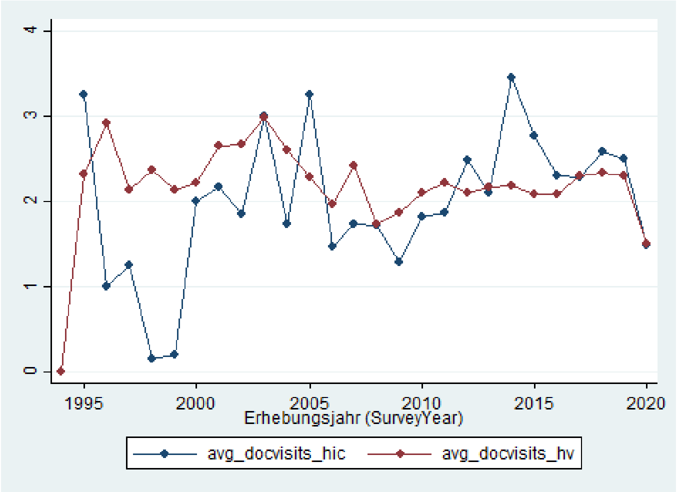


Figure A.6. Average Prob. of at least one Doctor Visit for AS&R in eHIC State vs AS&R in voucher state

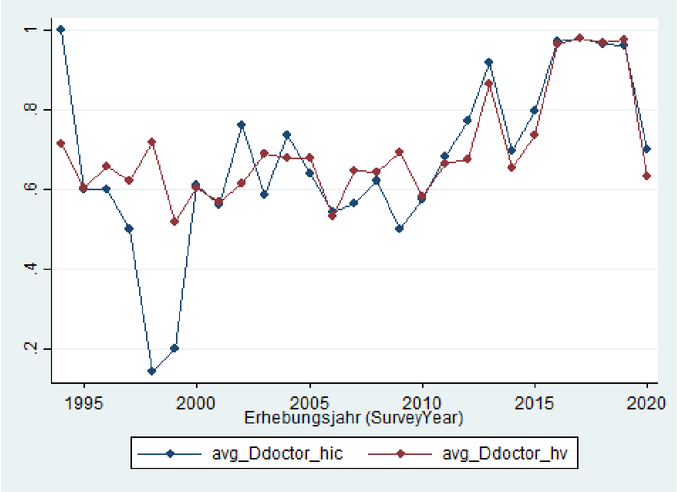


Figure A.7. Average No. Hospital Stays for AS&R in eHIC State vs AS&R in voucher state

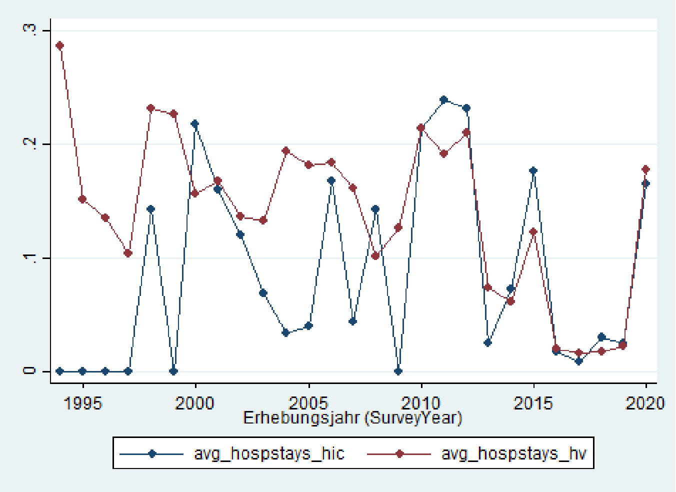
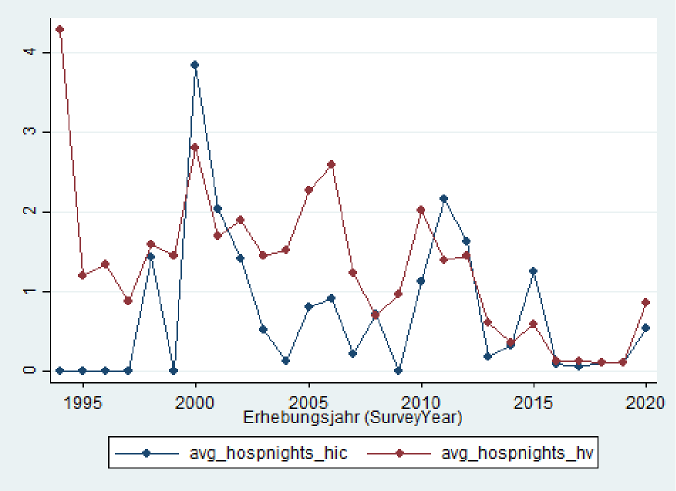


Figure A.8. Average No. Hospital Nights for AS&R in eHIC State vs AS&R in voucher state



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Health Status and Health Behaviour of Migrants in the UK:

Examining the Policy Intensity of the NHS Act 2014

1 Introduction

Over the past ten years, the British government has implemented several new pieces of legislation and acts affecting the NHS practice and services, i.e., asking it to enforce immigration controls and inform authorities of suspected undocumented migrants. The main purpose behind the introduction of such measures has been that of curtailing the so-called phenomenon of “health tourism”, but the overall impression among healthcare professionals is that it has created a situation of mistrust in healthcare and reduced access to services, even among adequately documented economic migrants. The NHS Act 2014 introduces an annual immigration health charge for migrants coming from countries outside of the European Economic Area (non-EEA migrants) planning to reside in the country for more than six months. The charge is not applicable for primary care services and exempted from charge are EU migrants and some vulnerable groups, i.e., refugees and asylum seekers. In 2017, a new piece of legislation introduced upfront charging in the NHS system, making it likely for migrants without papers to be charged before accessing standard secondary medical care. The overall perception among healthcare workers is that this legislative framework is hindering migrants’ access to healthcare by spreading uncertainty about a migrant’s entitlement to service and fear of being asked to pay for charges they cannot sustain, thereby discouraging them from accessing healthcare that is not primary and emergency and damaging their health on the long run. Several reports gathering opinions and impressions from health workers express the widespread feeling that the new regulation has fostered confusion and mistrust, and it has discouraged individuals with a migratory background from accessing services in a timely and continuous manner, regardless of whether they belong to a category exempt of charges or not (Bragg et al., 2019; *Report into refugee and migrant access to health care in Hackney*, n.d.; “Migrant Healthcare Access,” n.d.). While much focus has been given in political debates and media discourse on this perspective, little is known about potential effects of the change in regulations pertaining access to health care for individuals who migrate and comply with the payment of the surcharge. The main purpose of this research concerns whether a connection exists between migrants’ self-reported health levels and changes in legislation pertaining immigration and health access in the UK.

This paper uses secondary data on migrant individuals and their utilization of health care services over the years to seek evidence of any change prompted by difference in mechanisms for accessing health. Evidence on access and use to primary and secondary healthcare among migrants in the UK comes largely from small scale, local studies. Most reports and briefings commissioned by healthcare organisations and providers consist of qualitative studies and use primary data collected by mean of anonymous interviews to patients. Several limitations pertain this approach, e.g., the local (and thus little) external validity due to specific peculiarities of the local population and/or conditions of the health care system, which are hardly replicable on a larger scale and in a different context; and the small dimension of the sample, leading to possible bias. The purpose of this paper is to credibly fill these gaps by making use of a nation-representative dataset and resorting to a purely quantitative methodology which would allow to better isolate potential bias in the analysis and identify any causal effect. The dataset is a sample taken from the Understanding Survey between years 2000 and 2021: it includes individual and household characteristics, as well as information on several outcomes of health and use of medical care, country of birth and year of first enter in the UK, along with several socio-demographics. The approach of this research follows a difference-in-difference framework, considering the two main time frames before and after 2015 (the year when the NHS Act 2014 became effective), and modelling the relationship between health outcome and the independent variables of state of health and utilization of health care services with OLS regression. One important limitation is the possibility that the introduction of the new Immigration Act caused a selection in migrants determined to enter the UK, with those most likely to need medical assistance resorting to other destinations. To address this concern, the analysis is enriched with the use of immigration data from the UK Home Office on the amount of visa applications and outcomes, grants of extensions of leave to remain in the UK and returns (forced and voluntary). The effects highlighted in this analysis support the perceived feeling (detected by medical professionals and migration and social care workers) that linking provision of care to migration status has triggered responses and adjustments among affected individuals, both in their utilization of care services and in their self-reported health conditions. This empirical study aims at contributing to this debate providing a piece of quantitative evidence complementing the qualitative and mixed-methods literature existing on the topic.

Several strains of recent research have been devoted to migrants' health behaviour and engagement with healthcare, in an attempt to link different health concerns and outcomes with levels of integration in the host country. In relation to the UK context, relevant literature reports how, despite common opinions on the matter, migrants are not inherently younger and healthier than natives: in fact, their health deteriorates rapidly over time starting immediately after time of arrival (Jayaweera, n.d.; Jayaweera and Quigley, 2010; Johnson et al., n.d.). Although it is neither easy nor possible often to gain a comprehensive picture of the health of migrants due to the large variance existing among different ethnic groups and countries of origins, migration history, including length of residence in the country, and immigration status, recent pieces of research on the UK look at the correlation between migrants' health and uncertainty about their immigration status.

Evidence from qualitative literature has highlighted several barriers that migrants are facing in accessing healthcare, e.g., confusion, especially for newly migrated individuals and those with unsecured immigration status, around their rights concerning healthcare access and their entitlement to receiving care, and insensitivity and scarce preparation from front line healthcare providers to handle uncertain situations (Johnson et al., n.d.; Phillimore, 2016). Healthwatch Hackney, in partnership with Hackney Migrant Centre (in North-East London), produced a report on migrants' and refugees' health based on single interviews to individuals accessing support at Hackney Migrant Centre, along with health and social care workers. Their findings shed light on a common situation of reducing contacts with healthcare providers due to irregularity in documentation, proof of residence or immigration status, occurring mainly after the 2014 Immigration Act came into force. Another interesting finding is the tendency among migrants to resort to emergency healthcare instead of preventive secondary health services, which does not only put their health more at risk, but it is also more costly for the NHS (Report into refugee and migrant access to health care in Hackney, 2020). Quantitative research on migrants' health in the UK is severely limited by the scarce availability of data on socio-demographic characteristics of migrants, including variables on their income and wealth so to distinguish economically better-off from worse-off migrants. Routine administrative evidence collected at the point of registration within the health system merely reports ethnicity of the individual but does not collect information about their country of birth, nationality, date of arrival in the UK, or reasons behind migration. This lack of fundamental evidence often results in patchy and inaccurate research on the health of migrants, with focus on minority ethnic groups who are mainly UK born (Fitzpatrick et al., n.d.; Piachaud et al., 2009), and on health policies which mainly target ethnic inequalities, without including important determinants of the health of migrants, such as the conditions of their country of origin, the possible trauma derived from the migration process, and concerns about entitlement to care (Jayaweera and Quigley, 2010). The recent ‘Marmot Review 10 Years on’ (Marmot et al., 2020), a report produced by the Institute of Health Equity which followed the previous Marmot Review ‘Fair Society, Healthy Lives’ (Fair Society, Healthy Lives The Marmot Review, 2010), has been criticized for missing the opportunity to influence inequalities in health policy by shedding light on the impact that migration factors, interacting with ethnicity and socio-demographic characteristics, have on health status, healthcare access and barriers to care of individuals with a history of migration, in comparison with ethnic minorities born in the UK and holding UK nationality (Jayaweera, 2014). Jayaweera and Quigley (2010) address this gap in methodology in their paper ‘Health status, health behaviour and healthcare use among migrants in the UK: Evidence from mothers in the Millennium Cohort Study’, where they make use of a dataset of mothers of infants (under one year) born in the UK at the beginning of the new millennium and part of the Millennium Cohort Study (MCS). Their contribution aims at identifying the impact of determinants as country of birth, length of residence in the UK (for migrants), and ethnicity (among many other socio-demographic and economic factors) on health outcomes and healthcare use of migrant mothers. Their findings show a complex picture, where the variable ethnicity is indeed an important predictor for some health-affecting factors (e.g., smoking and alcohol consumption), but its power is smaller than other predictors, such as length of residence in the UK, in shaping the probability among mothers to report poor general health and depression (Jayaweera and Quigley, 2010). Karlsen and Nazroo (2010) use evidence from the Health Surveys for England 1999 and 2004 to look at the role played by religion in shaping health inequities. Their multivariate analysis include dependent variables such as self-assessed health level, longstanding illness, diagnosed diabetes and hypertension, smoking and practicing regular physical activity among a sample of Christians, Muslims, Sikhs, Hindus and individuals not belonging to any religion. The authors show how, despite ethnicity being a crucial determinant in patterning inequalities in health, religious identification, once controlled for ethnic origin, can starkly impact health indicators (Karlsen and Nazroo, 2010). Another research paper, from Norman et al. et al. (2015) uses pooled observations from the Health Survey for England 1998-2011 to examine the influence of spatial factors related to place of residence in the UK on ethnic inequalities in health. Their results paint a picture of broadening inequalities in health between some ethnic groups, where the gap is explained not so much by inherent ethnic features as spatial, geographical and socio-economic factors (Norman et al., 2015).

This paper intends to contribute to the literature concerning inequalities in health by looking at the impact that the NHS Act 2014 with the introduction of the immigration health surcharge has had on non-EEA temporary migrants. In fact, despite the many reports and reviews based on qualitative analysis which focus on proving the disruptive impact of 'hostile environment' policies on migrants' health (Fox and Hiam, 2018; Johnson et al., n.d.; Phillimore, 2016; Potter et al., 2020; Weller et al., 2019), there is no quantitative evidence on the case of non-EEA migrants complying with the surcharge. The immigration health surcharge affects individuals subject to immigration control who apply either for a visa to enter the UK for a period longer than 6 months or for an extension to their period of leave to remain in the UK in a temporary capacity. Payment of the health surcharge entitle the person subject to immigration control to receive the same level of treatment and care guaranteed to someone who is ordinarily resident. Similarly to UK residents, they are entitled to relevant services free at the point of use and must pay for services for which ordinarily UK residents are also charged, such as dentistry and prescriptions Payment of this health surcharge is mandatory and a necessary step for migrants submitting their immigration application, whereas the failure to comply with the payment might result in the rejection of the application or, if leave has been granted, cancellation of that leave. There are some categories exempted from paying the health surcharge, including persons who apply for entry clearance as visitors or for a period of six months or less, persons whose application rests on the ground of asylum or humanitarian protection, victims of trafficking, modern slavery or domestic violence (*Guidance on implementing the overseas visitor charging regulations*, 2022). There are several pieces of academic literature on the evaluation of the impact of immigration policies on migrants' health status: Martinez et al. (2015) conduct a systematic review of existing literature on the topic, critically appraising 325 papers examining the impact of immigration law measures on health outcomes for undocumented migrants across the timeframe 1990-2012 (Martinez et al., 2015). From a methodological standpoint, this analysis benefits greatly from the work of Devillanova, Fasani and Frattini (2018), and Fasani, Frattini and Minale (2020), whose works on the field of labour market integration of refugees and migrants both exploits a well-designed difference-in-difference approach to estimate the impact of policies related to legalization of immigration status on immigrants' employability prospects (Devillanova et al., 2018; Fasani et al., 2020). Another important contribution to this research has been Frattini (2017) and its considerations on how public policies and the host country's migration policy framework affect and shape immigrants' integration patterns (Frattini, 2017).

The remainder of the paper is organized as follows. In the next section I explain in detail the institutional context and the reform of NHS concerning access for non-EEA migrants. In section 3 I describe the data used in the analysis and definition of relevant variables. Section 4 presents the identification strategy. Section 5 summarizes descriptive statistics for the sample and section 6 is dedicated to empirical results on the utilization of health services and state of health of non-EEA migrants, together with heterogeneity and robustness checks. In section 7 I discuss the contribution of immigration data to the interpretation of results. Section 8 concludes.

2 Institutional Context

The introduction of the immigration health surcharge for non-EEA temporary migrants is one of the amendments concerning overseas visitors NHS charging regulations that have been implemented in

2015. Under the new regulations, not only does the provision of health care services becomes entangled with the immigration status of the patient, but also bodies providing NHS funded care services have a legal obligation to collect data on legal status of individuals to establish when and whether charges (or surcharges) apply. The following section provides an overview of the NHS (Charges to Overseas Visitors) Regulations 2015, the changes that it introduced in the existing system and some pieces of interpretation in literature of what they might imply for migrants' access to care. The National Health Service Act 2006 set the ground for a comprehensive health service intended to be free of charge unless a charge is expressly provided for by legislation. Primary care services are free of charge: everyone can register at GP, irrespective of their nationality or immigration status and registration does not require proof of address or information on immigration status of the individual. The Act establishes charges for prescriptions, dental services, optical appliances, and NHS services provided to anyone who is not ordinarily resident in the UK. Some services are always provided free of charge, both to residents and to migrants notwithstanding their residence status, and those are accident and emergency care (including maternity care), treatment of sexually transmitted infections, treatment of certain communicable diseases where treatment is deemed necessary for public health matters, family planning services (not included termination of pregnancy), treatment for victims of domestic and sexual violence, compulsory psychiatric services. Legislation regulating charges that persons who are not ordinarily resident in the UK are subject to when accessing NHS services dates back to 1977, and subsequent regulations, first introduced in 1982, impose a charging regime concerning hospital treatment for overseas visitors. The regulations define an overseas visitor as someone who is not ordinarily resident in the UK, but neither the 2006 NHS Act nor the regulations define the criteria to be considered 'ordinary resident' (Powell, 2020). In 2013, the UK Home Office started consultations on the subject of a revision of rules and circumstances regulating migrants' free healthcare access to NHS services, as part of a wider crossgovernmental revision of migrants' access to public services. The main issue concerned the view that the UK's publicly funded healthcare system was being overly generous to non-taxpayers and that individuals subject to immigration controls should have access to public welfare and benefits commensurate with their immigration status. The government's intervention to regulate non-EEA migrant access to publicly funded healthcare services in the UK was meant to curb alleged abuse of NHS services, since migrants were able to access free NHS care immediately or soon after arrival in the UK (Office, n.d.). In line with the belief that a migrant's entitlement to benefit from UK public services and benefits should be linked to their immigration status, government intervention articulates in the following three proposals: making permanent residency the qualifying condition for entitlement to free NHS treatment; introduction of a new mean to regulate temporary migrants' access to care through NHS (either a surcharge to be paid when submitting an immigration application, or a requirement to hold medical insurance); proposals to extend charging to primary care services as well, in an attempt to curb the phenomenon of "health tourism" (*Visitor & Migrant NHS Cost Recovery Programme - Implementation Plan 2014–16*, 2014).

In July 2014, the Visitor and Migrant NHS Cost Recovery Programme Implementation Plan was unveiled, and it outlined four phases of work:

- ✓ Improving the existing system.

Phase 1 intends to support the recovery of costs from chargeable non-EEA visitors and migrants by improving existing systems and processes for identification, charging and reporting, and to implement a process of sanctions whereby a sanction is levied against a provider if they are found to be failing to identify chargeable patients. Also, Phase 1 includes an increase of charging to 150% of the NHS standard tariff for visitors who live outside the EEA who are not covered by personal health insurance for any care they receive (Powell, 2020). Non-EEA temporary migrants (including students and workers) differ from non-EEA visitors as they are subject to payment of the so-called 'immigration health surcharge' as part of the visa process. This will mean they are entitled to use the NHS as ordinary residents would, whilst they have valid leave to remain (usually a period between 6 months to 5 years) and are not subject to additional upfront charging (*Visitor & Migrant NHS Cost Recovery Programme - Implementation Plan 2014–16*, 2014). Some categories of migrants who are exempt from charges or from payment of the surcharge are: individuals insured for care in a EEA member state or Switzerland and holders of a European Health Insurance Card (from January 1st 2021, EU/EEA citizens became chargeable), refugees and asylum seekers, victims, and suspected victims, of human trafficking and modern slavery, prisoners and immigration detainees (Powell, 2020).

✓ Aiding better identification of chargeable patients.

A new process has been designed to provide identification for prospective patients whose immigration status entitles them to use NHS care as a person ordinarily resident in the UK would, whilst they have valid leave to remain. The same process gives directives for improving cost recovery from non-EEA visitors, who remain chargeable. Its aim is to ensure that individuals themselves are aware that they would be expected to cover the costs of their hospital care before having treatment and are equipped to make a decision about their best option. The new process has been designed such that it would capture the chargeable or non-chargeable status of every patient requesting NHS care and facilitate easier identification of chargeable patients across all NHS settings. Providers of care are legally required to check eligibility of patients to receive relevant services without charge. Primary responsibility falls on patient-facing administrative teams, with assistance from frontline staff, e.g., receptionists, in collecting information related to patients' usual residence. Whether their latest place of residence is the UK or not, patients could be asked to demonstrate that they are entitled to relevant services without charge, whether by being ordinarily resident or having the immigration status of indefinite leave to remain, or having paid (or had waived) the immigration health surcharge, or under a reciprocal healthcare arrangement (“Chapter-on-Who-can-access-NHS-services-and-who-is-required-to-pay-charges-for-NHS-services-002-1,” n.d.).

- ✓ Implementing the immigration health surcharge.

In this third crucial phase of the Cost Recovery Programme, the main goal is to explicitly make entitlement to care conditional on immigration status and residence in the UK. Non-EEA temporary migrants applying to enter the UK for more than six months, or applying to extend their leave to remain, are required to pay the immigration health surcharge, i.e., £200 per person per year, payable upfront at the time of submitting their application. The amount payable by students has been reduced to £150 per annum[19]. The charge is payable where non-EEA national applicants submit a visa application to work, study or join their family in the UK for more than six months after 6 April 2015, as well as when they applies for extensions on their leave to remain from within the UK. Those who pay the surcharge (or are exempt from paying it) will then be able to access the NHS on the same basis as a resident for as long as their leave to remain is valid (Gower, 2020).

- ✓ Extending charges outside of NHS hospitals.

This includes considerations on extending charges in secondary care into emergency services and non-NHS providers of NHS care; introducing charges for primary medical services (with the exception of GP and nurse consultations) and other primary care services such as pharmacy, optics and dentistry. The majority of people who would be affected by these extensions are tourists and short-term migrants – people who are in the UK for no longer than 6 months (*Visitor & Migrant NHS Cost Recovery Programme - Implementation Plan 2014–16*, 2014).

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[19] Both amounts have been doubled effective from January 2019 to £300 per year for international students and Tier 5 temporary migrants and £400 for all other applicants (Gower, 2020).

The concept of charging in health care provision is not an innovation: the NHS Act 2006 also set charges for some services that applied to all prospective patients, regardless of immigration status. A system of charging for individuals who are not ordinarily living in the UK had been already designed and codified in previous NHS regulations, but its actual implementation had remained mild, due to the lack of clear specification of what 'ordinary residence' means. The 2015 charging regulations rests on amendments in immigration law coded in the 2014 Immigration Act. The act changes the meaning of 'ordinarily resident' for the purposes of the NHS Act so that non-EEA nationals cannot be deemed ordinarily resident unless they have been granted Indefinite Leave to Remain (ILR) in the UK. The Immigration Act 2014 amendments potentially widen the scope of migrants who are chargeable as previously, where someone had been lawfully resident in the UK for 12 months continuously, they would become exempt from payment. This no longer applies, and all temporary migrants are potentially chargeable. Whether the person has paid tax or national insurance in the UK is irrelevant when establishing whether they are chargeable and only ordinary residence applies as eligibility-defining criterion (*May 2022 Guidance on implementing the overseas visitor charging regulations*, 2017). The NHS Act 2015 came into effect on April 6th 2015 and from this moment on charges to non-EEA temporary migrants and visitors became effective, both in the form of the surcharge and upfront charging. The provision of NHS care has been made dependent on residency status and payment of a health surcharge is legal prerequisite when submitting an application to work, study or visit relatives in the UK for a period of longer than six months, or when applying for a visa renewal. As for the third measure subject to governmental consultations, concerning charging of migrants for emergency and primary health services, deliberation on the matter has been postponed and such services continue to be provided free of charge (Mori, 2017).

Following the introduction of new NHS regulations for migrants' access, theoretical and empirical evidence has been produced to assess the meaning and impact of charging on migrants' health.

Keith and Van Ginneken (2015) argue that the majority of undocumented migrants entering the UK does so regularly and become irregular at a second point, when the work or spousal relationship on which their visa depended upon ended abruptly (often due to exploitation on the workplace or domestic violence), thus making their work or family visa invalid or impossible to extend. This category of vulnerable migrants would not be protected by the system of surcharges, as their present irregularity while trying to regularise their residence would put them at risk of not accessing adequate medical care. The authors point at another specific group of vulnerable migrants who are not being protected in the system of charges for medical care, namely those who regularly reside in the UK but are in poverty conditions. They are subject to become irregular migrants if they cannot afford to pay the health surcharges when applying for extending their leave. Administrative delays, fees and requirements to comply with when presenting an immigration application might also cause applicants not being able to extend their leave in a timely manner and thus becoming "undocumented" (Keith and van Ginneken, 2015). Other pieces of literature have analysed and estimated the true impact of the new immigration policies on different categories of migrants and on natives. Weller et al. (2019) conducted a cross-sectional observational study on patients in the UK accessing healthcare through Doctors of the World (DOTW), a humanitarian organisation that provides care and health services to those who cannot access NHS healthcare. The authors link the 2014 restrictive regulations to the aim of the government to create a hostile environment for illegal migration by denying individuals without legal and proper documentation any access to health services, where the expression "hostile environment" was used by the then Home Secretary Theresa May during an interview with The Daily Telegraph in 2012. In line with this objective, the 2014 regulations have then been followed by an attempt to regulate the sharing of confidential non-clinical information about patients between the NHS and the Home Office, in order to facilitate immigration rules enforcement. Despite the Memorandum of Understanding (MoU) in question being withdrawn in 2018 in the midst of public dismay and criticism, the flow of patients' information and data from NHS trusts to the Home Office continued: Weller et al. (2019) argue that such extreme measures have contributed to the creation of an environment of mistrust and fear among migrants when accessing mainstream healthcare provision. In their empirical study, Weller et al. (2016) use data collected during social and medical consultations with patients in DOTW clinics in London and Brighton in 2016, where conversations ranged from medical history and health status, to family, income, housing situation and immigration status. Their findings indeed show how an increased share of undocumented migrants and asylum seekers resorted to DOTW after being denied NHS care, and an even higher percentage never sought healthcare within the NHS, regardless of the specifics of their immigration status (Weller et al., 2019). Along the same research concern, other studies have focused on similar steps of implementation of the new so-called "hostile environment" and on their impact on individuals' health. Hiam et al. (2018) investigate the potential impact of data sharing as foreseen by the 2017 MoU between the NHS Digital and the Home Office on migrants' health and health professionals' work, highlighting the potential harm not only to patients from disclosing sensible information and thus harnessing their future engagement with public health, but also to health workers in the provision of their services (Hiam et al., 2018). Potter et al. (2020) focus their analysis on the impact of the 'NHS Visitor and Migrant Cost Recovery Programme Implementation Plan', launched by the government in 2014 to recover costs from patients who were chargeable under the new regulations, on diagnostic delay in tuberculosis cases, which most likely to occur for people born outside of the UK (Potter et al., 2020).

I use data from the Understanding Society survey for the years between 2000 and 2021 and exploit the introduction of the immigration health surcharge in April 2015 to evaluate the effect of the immigration health surcharge on non-EEA temporary migrants' utilization of NHS care services in the UK. The analysis leaves aside non-EEA visitors whose situation differs from temporary migrants as they are charged upfront at point of use when accessing medical care. The focus of this analysis verges on how change in charging for (secondary) health care affects patients and their patterns of utilization of services. The comparison is made against non-EEA migrants whose length of continuous stay in the UK allows them to become ordinary residents: hence, they are not affected by the health surcharge.

3 Data

In the next section, I will present the dataset used for the analysis, along with criteria for selection of the final sample and definition of the main dependent variables.

3.1 Sample Selection

I use data from Understanding Society, a longitudinal survey of households in the UK available via the UK Data Service. It is up to date one of the largest regular social surveys implemented in the United Kingdom and it contains pieces of information on health, education, income, work and social life of respondents to give insight on long-term effects of social and economic change and policy interventions. Understanding Society builds on its predecessor project, the British Household Panel Survey, which was started in 1991 with an initial sample of 5,000 households interviewed in the UK. In the following years, additional samples of households in Scotland Wales and Northern Ireland were added to the main sample, making the panel suitable for UK-wide representation. Understanding Society (UKHLS) replaced the British Household Panel Survey (BHPS) in 2009, with approximately 40,000 households recruited in Wave 1. Most BHPS design feature, tool and question has remained unchanged in Understanding Society, and data collection from the BHPS sample continues as part of Understanding Society, providing an opportunity to leverage data from the two studies jointly to create a long panel of data. Participants from the British Household Panel Survey were asked if they would like to join Understanding Society and over 6,000 of them did so.

Households interviewed in the first round of the survey are contacted regularly each year for data collection on changes to their household composition and personal circumstances of household members. Interviews are carried out either face-to-face by trained interviewers at the respondent's home or through an online survey. All respondents aged 16 or older complete the adult questionnaire, while young people aged 10-15 are given a separate youth questionnaire. Understanding Society is made up by one main sample (General Population Sample) and three additional components: the Ethnic Minority Boost Sample, the former British Household Panel Survey sample (covering years 1991 to 2009) and the Immigrant and Ethnic Minority Boost Sample (*Main Survey User Guide*, n.d.).

I consider individuals interviewed between the years 2000 and 2021 included (BHPS Wave 10 to UKHLS Wave 11), with the cut-off being April 2015. During this time-lapse, the Brexit referendum happened, which is expected to have had a big impact on decisions to migrate for foreigners. Since EEA and EU migrants are the ones mostly concerned by changes prompted by Brexit in terms of access to welfare and health care and to avoid potential confounding from selection, I excluded EEA migrants from the sample pool of analysis. I have also excluded EEA migrants whose health care access conditions are comparable to those of UK natives. Throughout the analysis, migrants are identified as people coming from a certain country based on their place of birth rather than their nationality. This choice has been dictated not only by the availability of the data, but also due to the concern that, while the place of birth is predetermined, one could potentially change nationality for reasons that may be correlated to their eligibility to benefits and, hence, generate endogeneity (Borjas, 1996). The final sample comprises 55,613 individuals who completed an adult questionnaire (aged 16 and over) who are originally from a non-EEA country and arrived in the UK any time between 2000 and 2021. Out of this migration pool, individuals who are exposed to the effects of the introduction of the health surcharge are migrants whose length of stay in the UK does not exceed 5 continuous years (2,971 individuals in total). Observations with missing outcome or control variables have been excluded from the sample.

Table 1 shows the final sample resulted from the selection process, divided by country of birth. The first column is related to non-EEA migrants who have been in the UK for less than 5 years of continuous residence, i.e., non-EEA temporary migrants: they are the group liable to payment of the immigration health surcharge after April 2015. Their outcomes are compared against non-EEA migrants whose length of residence in the UK has exceeded 5 continuous years at the time of interview (second column of Table 1). After 5 years of stay in the UK, migrants are potentially eligible for the status of ordinary residence, thus being comparable to natives as far as their NHS entitlements and contribution are concerned. As the year of arrival is the only consistent piece of information regarding migration history of respondents, I calculate the length of stay in years: hence, I select as treated all individuals for whom time elapsed since date of arrival is strictly less than 5 years. The exact month of arrival in the UK is a variable available in some of the waves, but the frequency of this piece of information does not allow to include it as a building block of a longitudinal analysis. Also, the individual's country of birth is not consistently asked throughout the survey and answers regarding origin are often imprecise. That is the reason why only a few non-EEA countries of origin are mentioned, and most answers are indistinguishable within the 'other country' category. This causes further restrictions to the available sample. Lastly, it is worth mentioning that the analysis is focused on non-EEA temporary migrants who are not eligible for status of ordinary residents in the UK at time of interview, and not on non-EEA visitors. Those are individuals who have been in the UK for less than 6 months and become chargeable upfront for any NHS care service that might need during their stay in the UK. They are affected differently than temporary migrants by the NHS reform, particularly in the increase of charging that applies to them, and they are more likely to be experiencing delay in treatment since the NHS Cost Recovery Plan set new directives for care providers and medical staff to inquire about eligibility for treatment before administering secondary care. Non-EEA visitors are not however identifiable in a survey such as Understanding Society and would anyway made up for a very small working sample, probably not enough for a longitudinal analysis.

Table 1. Sample Size by Country of Birth

Non-EEA Migrants

Country of birth	Length of stay <5 yrs	Length of stay >5 yrs
Cyprus	3	498
	0.60	99.40
Turkey	31	518
	5.65	94.35
Australia	38	643
	5.58	94.42
New Zealand	19	446
	4.09	95.91
Canada	15	467
	3.11	96.89
U.S.A.	79	1155
	6.40	93.60
China/Hong Kong	148	1183
	11.12	88.88
India	579	7149
	7.49	92.51
Pakistan	292	6326
	4.41	95.59
Bangladesh	227	4672
	4.63	95.37
Sri Lanka	86	1516
	5.37	94.63
Kenya	15	1634
	0.91	99.09
Ghana	47	1294
	3.50	96.50
Nigeria	180	1873
	8.77	91.23
Uganda	11	773
	1.40	98.60
South Africa	48	1262
	3.66	96.34
Jamaica	25	2421
	1.02	98.98

Other country	1128	18812
	5.66	94.34
Total	2971	52642
	5.34	94.66

First row has *frequencies* and second row has *row percentages*

3.2 Variable Definition

The Understanding Society questionnaires contain a wide range of health-related thematic areas, such as: health behaviour, effects of health on daily life and employment opportunities, use of health and welfare services, subjective wellbeing, personal health conditions, hospital and clinic use, medical consultations. Not all relevant questions on use of care services and state of health are recorded in every wave and this limits the number of variables available for a panel analysis. I include in the analysis two types of variables, one related to utilization of health services both at the extensive and at the intensive margin (i.e., both incidence and frequency of utilization of services), and one pertaining self-assessment of health. The choice of relying on self-reported definitions of health as indicators of effective health status has been partly dictated by the availability of secondary resources, but it is also supported by relevant economic literature. There is a strong consent on the appropriateness of self-reported measurements of health as reliable indicators of an individual's effective health condition and well-being. Chandola and Jenkinson (2000) investigate the concern that self-rated health as a measure of general health across different ethnic groups may not provide reliable and valid data, given the possible different interpretation given of the notion of health. Their findings show how indeed poorer self-rated health reflected greater morbidity within each ethnic group considered (Chandola and Jenkinson, 2000). The outcome variables are synthetised in Table 2, together with their nature and frequencies across the questionnaire's waves. The variables on incidence of utilization of services are three dummies, respectively related to visits to a local doctor, visits to a local hospital and whether the respondent has been hospitalized overnight or longer (in-patient care): both of them are framed so that respondents are asked whether in the last 12 months they have at least once made use of one of the mentioned services. To answer about frequency of utilization of care (intensive margin), I use different variables that are consistently part of the BHPS questionnaires and are resumed only from Wave 7 (2015) of the UKHLS survey. They are respectively the number of visits to the GP and the number of visits to out-patients: both of them are categorical variables labelling the number of visits, ranging from 0 "None" to 4 "More than ten". On self-assessment of health, I use a variable on state of health as perceived by the individual surveyed, where categories range from 1 "Excellent" to 5 "Poor", and a variable on satisfaction with personal health, where 1 corresponds to "Completely dissatisfied" and 7 to "Completely satisfied".

Table 2. Definition of Health Variables

Variable	Waves	Type of variable	Definition
Use of local doctor	4, 6, 10	Dummy	Have you made use of this service (local doctor) over the past 12 months?
Use of local hospital	4, 6, 10	Dummy	Have you made use of this service (local hospital) over the past 12 months?
Hospital admission (in-patient care)	BH01 - BH18, 7, 8, 9, 10, 11	Dummy	In the last 12 months, have you been in hospital or clinic as an in-patient overnight or longer?
No. visits to GP	BH01 - BH18, 7, 8, 9, 10, 11	Categorical	In the last 12 months, approximately how many times have you talked to, or visited a GP or family doctor about your own health?
No. visits to hospital (out-patient care)	BH07 - BH18, 7, 8, 9, 10, 11	Categorical	In the last 12 months, approximately how many times have you attended a hospital or clinic as an out-patient or day patient?
State of health	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	Categorical	How would you say your health is?
Satisfaction with health	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	Categorical	How dissatisfied or satisfied are you with your current health?

I include several socio-demographic variables relevant for the analysis, i.e. age, sex, marital status, presence of dependent children in the household, educational qualification, employment status. Due to the fact that I am dealing with two different questionnaires (BHPS and UKHLS), some of the variables have been manipulated for the sake of harmonization throughout the panel. As for education, categories of qualifications after harmonization include “Degree or other”, “A-level or equivalent”, “GCSE or equivalent”, “Other” and “None”. Categories for employment have been simplified to either “employee or self-employed” and “not employed”. I also include Government Office Region as geographical indicators of residence: North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East of England, London, South East, South West, Wales, Scotland and Northern Ireland.

4 Empirical Strategy

The aim of the analysis is to estimate the effect that a policy designed to curb the phenomenon of ‘health tourism’ and recover costs of welfare for non-residents had non-EEA temporary migrants (subject to payment of the health surcharge) in terms of their utilization of the host country’s health care system and services. The group of treated include individuals who migrated to the UK from outside the EEA and have been in the UK for less than 5 years at time of interview. This constraint on length of stay ensures that treated individuals are not ordinarily residents as per Immigration Act 2014 and NHS regulations, as the status of ordinary residence in UK cannot be legally granted before 5 years of continuous stay. The natural control group to consider is the pool of non-EEA citizens whose length of stay in the UK exceeds 5 continuous years, for a number of reasons. First, it can be safely assumed that treated and control migrants in this framework select with the same criteria in their migration choices. Second, all countries of origin belong to the same institutional framework, i.e., outside the EEA area where separate regulations in terms of migrants’ entitlements apply. For this very reason, citizens of the European Union are excluded from the controls, since their situation in terms of access to health care changes from January 1st 2021 and, for the time period covered by my sample, their rights are comparable to those of UK citizens and ordinary residents. Lastly, as shown in the model below, I take into consideration a whole range of observables characteristics, including the ones that are typically associated with use of health care services, i.e., age and gender, and include them in the set of control variables. In the main specifications I estimate a regression Difference-in-Differences (DiD) model comparing the health outcomes of non-EEA temporary migrants before and right after the April 2015 cut-off such that:

$$Y_{itr} = \alpha + \beta T_i{*}reform_t + \gamma X_{itr} + \mu_r + \tau_t + \theta(group_i{*}year_t) + \varepsilon_{itr} \quad (1)$$

where T_i is a dummy for being born in a country outside of the EEA and $reform_t$ is a dummy for being surveyed after April 2015, the date when the immigration health surcharge came into effect. Hence, β is the coefficient capturing the effect of interest, i.e., the effect of the NHS reform on migrants paying the surcharge. I also include a vector X_{itr} of socio-demographic covariates of individual i residing in region r and surveyed at time t. This contains age, gender, marital status, presence of dependent children in household, education, employment status. To control for characteristics of the area of residence I include μ_r, a set of regional fixed effects, whereas to control for time-specific fixed effect I add a set of year dummies τ_t. By construction, individuals who pay the surcharge (temporary migrants) are potentially very different from individuals in the control group, who can acquire ordinary residence in the UK as their length of stay in the country exceeds 5 years of continuous residence. Unobserved intrinsic differences between these two groups could confound health outcomes, e.g., use of health care could be dependent on how long individuals have been living in the UK and how familiar they are with NHS bureaucracy or how much knowledge they have about their entitlements. To address this potential threat to the identification strategy, I include in the model group-specific linear time trends, which should account for potential differences in trends across treated and control units that are unrelated to the treatment. The idea is that a time trend should capture any time movement that explains any variation in the dependent variable not correlated with variation in the independent variables: generally, if the correlation between the dependent and independent variables is higher than that between the dependent variables and time, there would be no doubt of a spurious relation between the two; if not, we can assume that any movement in the dependent variables is due to time and the coefficient on the main independent variables would remain insignificant in the model. Therefore, by including time trends, the model ensures non-spurious relations between the dependent and all independent variables. Lastly, ε_{itr} is an idiosyncratic shock and standard errors are clustered at individual level, which is the level of treatment.

The coefficient of interest β is correctly identified and estimate true causal effects provided that certain relevant conditions are met (Lechner, 2010). First, it must be that the change in health policy concerning migrants did not lead to a sudden change in the influx of migrants to the UK because this might bias estimates of utilization of health services away from the pure impact of the NHS reform. Also, another possible confounder would arise if the composition of migratory flows would be significantly different before and after April 2015: changes in the way temporary migrants can access NHS care and ought to pay for it could have played a role in decision to migrate for workers, students and family members joining their relatives in the UK. Another related problem with the strategy comes from the dataset structure, as some of the dependent variables on utilization of health are not systematically included in the survey and for some of them there is a gap of several years. This arises the issue on whether the composition and influx of migrants to the UK has changed in the years before the NHS Act and could be the explanation behind major changes in patterns of utilization of health care. To answer these questions, I resort to data on immigration to the UK collected and made available by the UK Home Office. Using information on visa applications and outcomes, extensions and returns from Immigration Statistics, I get into further details on these issues in section 7. Moreover, for the correct identification of the model, the common trends assumption must hold. This implies that, in the absence of the treatment, non-EEA temporary migrants would have experienced the same trends in their health outcomes as non-EEA migrants who are ordinary residents in the UK. While this is not testable, to support the credibility of the model I resort to an event-study analysis with the following specification:

$$Y_{itr} = \alpha + \sum_{\lambda=2008}^{2014} \beta_{\lambda}(T_i{*}year_t) + \sum_{\pi=2016}^{2021} \beta_{\pi}(T_i{*}year_t) + \gamma X_{itr} + \mu_r + \tau_t + \theta(group_i{*}year_t) + \varepsilon_{itr} \qquad (2)$$

where the omitted year (2015) is the year where the policy change came into effect. Another threat to this identification strategy is that changes in health outcomes are directly correlated with any socio-demographic, political or geographical change occurring at country or regional level and modifying the composition of the groups, thus directly affecting their likelihood of reporting any health issue. The double fixed-effect specification of the model addresses this issue, taking care of factors, which are either country specific but time invariant or time specific but common to all UK countries in the sample, although it needs to be pointed out that this does not prevent the effect to be different across UK countries. Lastly, another risk may be represented by the choice of a Linear Probability Model (LPM) instead of a probit or a logit model for dependent dummy variables, which may arise concerns regarding some “undesirable” properties of the LPM. First, LPM estimates are not constrained to the unit interval. Second, the residual would be heteroskedastic in case of binary response variable, as it is in this case. A third and related concern would be that, since residuals are not normally distributed, inference in small samples cannot be based on tests based on normal distributions, such as the t-test. We consider those last two issues addressed by respectively the use of a large sample and heteroskedasticity-consistent robust standard errors estimates. As for the first concern, Horrace and Oaxaca (2006) show how the potential bias of the LPM is directly correlated to the relative proportion of LPM predicted probabilities that fall outside the (0,1) interval: if this proportion is expected to be insignificant, the possibility for bias and inconsistency of the LPM would be relatively small.

5 Descriptive Statistics

Table 3 shows averages outcome and control variables[20] used in the analysis by length of stay for non-EEA migrants. The first row shows averages for the 'controls', non-EEA migrants who have been i the UK for more than 5 continuous years and are thus eligible for grant of ordinary residence; the second row reports means of variables for 'treated' migrants, i.e. non-EEA nationals who do not ordinarily reside in the UK. Both groups of migrants are comparable in terms of gender composition of the sample, whereas they strongly diverge in terms of age composition. Non-EEA temporary migrants are approximately 31 years old at time of interview, while this average tends to be larger (roughly 47 years old) for ordinarily resident migrants. Also, migrants in the 'control' group are more likely than the treated to be married at time of interview and to have dependent children in the household. This is consistent if we think that the longer individuals stay in the country of destination and the more they get accustomed to life there and permanent members of the host society, welfare system, job market, the more likely that their family is able to reunite with them. In terms of outcome variables on utilization of health, temporary migrants appear less likely to make use of local GP services and out-patient care than migrants with longer stay in the UK. Yet, they are more likely to benefit from in-patient care treatment at least once more than migrant who are ordinarily residents. Looking at the intensive margin of utilization of health care, treated migrant use GP and out-patient care less frequently than controls. Not surprisingly, their satisfaction with their own health is lower, however, their self-reported state of health is higher with respect to migrant who have been in the UK for more years. This is consistent with both with the established existence of a 'health migrant effect', whereby migrants are healthier than natives at time of migration as the healthiest individuals choose to migrate, and with the more recent concept of 'unhealthy

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[20] Not all control variables used in the analysis are reported in the table, only basic socio-demographic characteristics: in addition to that, the model will also include information on education and employment status or respondents.

assimilation', which is based in the evidence that migrants' health tends to rapidly assimilate to the health of natives and to worsen relatively quickly as length of stay in the destination country increases (Giuntella and Stella, 2017).

Table 3. Descriptive Statistics

	Age	Sex	Marital status	Presence of dependent children	Use of local GP	Use of out-patient care	Use of in-patient care	No. visits to GP	No. out-patient care admissions	State of health	Satisfaction with health
Non-EEA ordinary residents	46.6	1.563	2.253	.389	-2.21	-2.457	.081	1.556	.619	1.19	2.26
Non-EEA temporary migrants	31.3	1.525	1.742	.373	-1.27	-1.56	.094	1.498	.533	.967	2.212

6 The Effects on Use of Health Care

In this section I present the main results of the effects of the health immigration surcharge on non-EEA temporary migrants' use of health care. First, I evaluate the impact on the set of outcomes previously discussed for the whole sample; then, I consider heterogeneity in the effects by gender, age, ethnicity and area of residence, and I also discuss a series of robustness checks to validate results.

6.1 Results

Table 5-7 report coefficients associated with the interaction term *Non-EEA temporary migrants*post 2015* from the estimation of the main DiD specification of Equation (1). I report results from linear probability models and account for the heteroskedasticity implicit in this choice by using robust standard errors. Results are divided into three tables according to the different nature of the variables and the outcome they inform about: utilization of health care services, both at the extensive and at the intensive margin, and self-assessed state of health. Table 5 summarizes results for incidence of utilization of local GP services, out-patient (local hospital assistance) and in-patient care (whether the patient has been under observation overnight or longer). Table 6 show coefficients for the following outcomes: number of visits to or contacts with the GP and number of hospital visits. Lastly, Table 7 contains results for self-reported state of health and satisfaction with health[21]. For each outcome, different specification have been estimated to show consistency of results (when significant). In the first column for each outcome variable, Equation (1) has been estimated without any time-varying controls, in the second column year fixed effects and controls are added, and in the third column the model is complete with the inclusion of group-specific time trends[22]. The coefficients of the interaction term are not statistically significant in the main specification for outcomes on utilization of health, suggesting that being exposed to charges in access to medical care does not have a significant impact on non-EEA migrants. In Table 7, the coefficient for 'State of health' does not have statistical significance, while the coefficient on 'Satisfaction with health' is positive and significantly different from zero in all specifications of the model. This suggests that satisfaction of non-EEA migrants with aspects related to their health increases after the NHS Act 2014. One possible mechanism could be that, once the cost for secondary health care services becomes a 'sunk cost', represented by the surcharge that the applicant has paid when submitting a visa application (or an extension on their visa), the individual has every incentive to follow up with secondary care, if referred so by their GP. Payment of the surcharge gives the complier the same entitlements as a UK citizen, without having to pay additional medical bills at any later point in secondary care treatment[23]. A positive effect on satisfaction with health could suggest that non-EEA migrants complying with payment of the surcharge appreciate

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[21] It is important to remember that 'Satisfaction with health' varies from 'very dissatisfied' to 'completely satisfied', whereas 'State of health' ranges from 1 'excellent' to 5 'poor': the direction of scaling is opposite.

[22] The inclusion of group trends is crucial to ensure that treated and controls show comparable patterns before the introduction of new regulations with the NHS Act, i.e., that the leads are not statistically significant.

[23] With the exception of cases where additional medical costs are foreseen for UK citizens as well (e.g., medical prescriptions).

the changes in payment and provision of services and feel able to take adequately care of their personal health.

Table 5. Effects of NHS reform on incidence of utilization of health care (extensive margin)

	(1) Use of local doctor			(2) Use of out-patient care			(3) Use of in-patient care		
Non-EEA temporary migrants * post 2015	-3.16***	-.407	-1.522	-3.091***	-.454	-1.443	0	.01	.006
	(1.149)	(.929)	(1.056)	(1.166)	(.962)	(1.067)		(.012)	(.024)
Observations	12098	12098	12098	12098	12098	12098	22352	22229	22229
R-squared	.005	.427	.428	.005	.423	.423	.001	.004	.004
Year Dummy	NO	YES	YES	NO	YES	YES	NO	YES	YES
Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
Group Trends	NO	NO	YES	NO	NO	YES	NO	NO	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 6. Effects of NHS reform on frequency of utilization of health care (intensive margin)

	(2) No. visits to GP			(3) No. hospital visits (out-patient care)		
Non-EEA temporary migrants * post 2015	-.471	-.306	-.351	-.235	-.089	-.121
	(.352)	(.253)	(.254)	(.176)	(.123)	(.134)
Observations	22352	22229	22229	22352	22229	22229
R-squared	.001	.021	.021	.001	.011	.011
Year Dummy	NO	YES	YES	NO	YES	YES
Controls	NO	YES	YES	NO	YES	YES
Group Trends	NO	NO	YES	NO	NO	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 7. Effects of NHS reform on self-assessed health

	(1) State of health			(2) Satisfaction with health		
Non-EEA temporary migrants * post 2015	.192	.269	.643	1.444***	1.6***	2.953***
	(.272)	(.27)	(.49)	(.414)	(.401)	(.752)
Observations	47575	47575	47575	47575	47575	47575
R-squared	0	.038	.039	.001	.037	.037
Year Dummy	NO	YES	YES	NO	YES	YES
Controls	NO	YES	YES	NO	YES	YES
Group Trends	NO	NO	YES	NO	NO	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

6.2 Heterogeneity

In this section I consider potential heterogenous effects of the NHS Act 2014 and seek to identify which groups (if any) might have been affected in their health and utilization of care services. Once shown how the reform does not seem to have had a consistent and significant effect on the whole sample of treated individuals, the next question is: are there specific categories that are significantly affected? How to capture this differential in effects? Reforming the way individuals can get access to medical treatment can have a very different impact on men and women. First of all, it is more likely that men migrate for work or study reasons and are thus contributing to the 'healthy migrant effect', while women are more likely than men to migrate on the grounds of family reunification. When this is the case, migration is partly driven by family motives and individuals do not represent a self-selected sample of the population in the country of origin with particularly good health and predisposition to integrating and joining in the host society. Moreover, often the task of child-rearing and housekeeping falls in larger proportions on women and this can differently effects than for men on their physical and mental health. When talking about health, gender is not the only important discriminating factor: age makes the patient more or less elastic to health care supply and more or less reactive to changes in the way health care services are accessible. Moreover, I look at differentials in terms of ethnicity and UK country of residence. This last choice of analysis is driven by the different reception of the NHS Act across the UK: in Scotland for instance, there has been a backlash in public opinion and amongst care professionals regarding directives of the NHS Act on sharing of the patient's data with immigration officers as check for identification of residence status and eligibility to treatment. The question is thus whether this adverse campaign against a highly controversial aspect of the reform contributes to impact on individual's utilization of services.

Table 8 shows coefficients of the interaction term of the model in Equation 1 for sub-samples of males and females. The positive effect on 'Satisfaction with health' remain significant for both groups, however, women also reports a negative effect on their state of health. On the extensive margin, men reports a positive and significant effect on the incidence of their use of in-patient care: after the reform in health care, non-EEA male temporary migrants are more likely than before to be hospitalized for in-patient treatment. No such effect is found on incidence of utilization of primary or out-patient care, whereas for women the main effects are on the intensive margin. Both frequency of access to primary care services and to out-patient care decrease significantly after April 2015.

Table 8. Effects of NHS reform on health outcomes – males vs females

	(1) Use of local doctor	(2) Use of out-patient care	(3) Use of in-patient care	(4) No. visits to GP	(5) No. hospital visits (out-patient care)	(6) State of health	(7) Satisfaction with health
Panel A: Males							
Non-EEA temporary migrants * post 2015	-.852	-1.043	.02*	-.002	-.018	.068	2.674**
	(.941)	(.869)	(.012)	(.083)	(.069)	(.771)	(1.311)
Observations	5244	5244	9494	9494	9494	20879	20879
R-squared	.423	.424	.007	.03	.023	.038	.035
Panel A: Females							
Non-EEA temporary migrants * post 2015	-1.92	-1.677	.02	-.917***	-.418***	1.033*	3.191***
	(1.178)	(1.175)	(.046)	(.121)	(.121)	(.622)	(.905)
Observations	6854	6854	12735	12735	12735	26696	26696
R-squared	.436	.428	.008	.032	.016	.041	.04
Year Dummy	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES
Group Trends	YES	YES	YES	YES	YES	YES	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Tables A.1 to A.3 reports additional estimations of the model with sub-samples for age, ethnicity and country of residence. As suspected, the main effects on frequency of utilization of services and state of health are significant in the groups of younger respondents (aged 15-25). After the reform, younger individuals use less primary care and out-patient care: it remains unanswered whether this implies a shift towards more secondary in-patient care, due perhaps to the fact that, knowing that any follow-up exams or visits in secondary care is paid contextually with their visa application, they are “free” from the upfront cost of extra charging for any secondary care service. A possible explanation behind this could be that that leaning more on in-patient care relieves pressure from primary and emergency care, although it cannot be confirmed by the current dataset. On the other side, their self-assessed state of health decrease significantly after the reform. The positive effect on ‘Satisfaction with health’ can be entirely imputed to the individuals aged 26-55 years (young adults to middle-aged) and the effect is higher for those aged between 40 and 55 years. Also, 40-55 individuals report decreased incidence of in-patient treatment utilization, whereas the effect becomes positive and significant for respondents older than 55 years. Table A.2 reports estimation for sub-samples of the main ethnicities represented in the dataset, which corresponds to the most common places of origin for migrants in the UK: India, Pakistan, Bangladesh, with the addition of China. Outcomes for these migrants are likely to be very different from outcomes for Western-born individuals, e.g., for those born in wealthier Commonwealth countries such Australia, New Zealand, Canada[24]. For individuals of Indian and Pakistani ethnicity, the frequency of utilization of primary and secondary out-patient care significantly increases and, exclusively for respondents of Pakistani ethnic origin, also the incidence of in-patient treatment sees a rise, together with a significant improve in self-assessed health conditions. The same trend of increase at the intensive margin of

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[24] Western-born respondents are not easily identified in the Understanding Society dataset based on their ethnicity, due to the fact that ‘White’ or ‘Mixed white’ ethnicity does not give a clear indication on origin or country of birth of the individual and does not allow a clear separation from British natives.

utilization of care can be seen for respondents of Bangladeshi and Chinese origin, while the extensive margin, i.e., incidence of access to a service, remains unaffected. Also, there seems to be no significant effect on satisfaction with health for individuals originally from India, Pakistan, Bangladesh or China: since it was evident from previous specifications that this effect exists for some categories, it remains open for whom satisfaction with health increases due to the effects of the reform in access to health. In Table A.3, coefficients for England and the rest of the UK (Scotland, Wales and Northern Ireland) are reported separately. It can be seen how the positive and significant effect on 'satisfaction with health' is entirely restricted to England, whereas the rest of the UK does not report any effect on how individuals feel about their own health. On the other side, utilization of health care services at the extensive margin (incidence of visits to GP and to out-patient care) are significantly and negative affected by the reform: it could be coherent with the intense protest campaign that took place especially in Scotland against the Memorandum of Understanding concerning disclosure of nonclinical patient information to the Home Office for the purposes of investigating immigration offences[25], and the discomfort of medical staff and patients with NHS new regulations. Interestingly, the frequency of utilization of out-patient care reports a positive and significant effect: at the intensive margin, individuals who do not cut demand of health care services actually have an increased frequency of out-patient visits.

6.3 Robustness Checks

In order to ensure that the results obtained in estimation are robust and interpretation is solid, I first look at the validity of the parallel trends assumption. The main DiD assumption requires pre-existing trends in the outcome variables for both treated and controls to be parallel before the cut-

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[25] The Memorandum of Understanding between NHS Digital and the Home Office has been amended in May 2018: the government announced that it would narrow when the Home Office can request non-clinical information from NHS Digital to very limited circumstances. The MoU, which came into effect on January 1st 2017, has been formally withdrawn in November 2018.

off, conditional on the set of socio-demographics characteristics of individuals (Roth et al., 2022). In order to test for this assumption, I performed an event study by including leads and lags in the model as shown in Equation (2). Note that, due to the staggered composition of questionnaires in the survey, not all questions regarding outcome variables of interest are consistently part of the survey in ever wave, i.e., not all individuals observe the same numbers of pre and post reform years. For instance, outcomes on incidence of access to in-patient treatment, and frequency of visits to GP and out-patient care are regularly asked in all BHPS questionnaires (up to 2008) and then dropped in the following years until they are again included in the survey in 2015 (UKHLS Wave 7). Moreover, outcomes on incidence of access to GP services and out-patient care (extensive margin) are included in only three waves, i.e., in UKHLS Wave 4, 6 and 10. As a consequence, I binned up the endpoints in the event study specification including up to 6 pre-implementation periods, where the last dummy summarizes remaining "older" implementation periods, and 6 post-implementation periods, where again the last and most recent dummy in the visual representation contains all observations from the sixth implementation period onwards (Dimitrovová et al., 2020). If the data fit the parallel trends assumption, coefficients on the leads (pre-implementation periods) should not be statistically different from zero, confirming that there were no significant differences in trends between non-EEA migrants and temporary migrants prior to the NHS Act 2014 provisions. Figures A.1 – A.7 show that this is the case for all of the outcome variables used in the analysis by gender[26]. Crucial for the validity of the parallel trends assumption has been the addition of group-specific trends, as discussed previously when outlining the empirical strategy. With group-specific trends allowing for each group of migrants to follow their own overall linear trend, the model is controlling for all time-varying linear factors that could bias results. Furthermore, I run a placebo

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[26] This specification for the event study has been chosen due to the fact that most coefficient of the interaction term on outcome variables show statistical significance for male and female sub-sample but lose their statistic power when estimated over the sample as a whole.

test focusing on a span prior to the NHS Act 2014 (that is, the period between 2000 and 2014 included, leaving out all 2015 as implementation year of the reform) and I run the model in Equation (1) using several false cut-offs, namely one every year from 2010 to 2013. Coefficients in Table A.4 confirm the absence of aby systematic treatment effect before actual treatment in April 2015: not only are they not statistically significant, but also their magnitude is virtually zero. The only exception is the coefficient for 'State of health' on women, which is significant, albeit its magnitude is extremely low and close to zero. One possible interpretation of this is that women's health[27] has been facing a decline over the years considered in the analysis, and the reform in access to health might have exacerbated this trend.

7 Changes in Migratory Flows

The evidence in previous sections outlined how changing the way non-EEA temporary migrants pay for health care and NHS services has had significant impact in terms of utilization of health care and self-perceived health state and satisfaction with health, highly differentiated by gender. The question that follows is, then, whether this impact can be entirely imputed to the causal effect of the reform in access to care or is it partly to attribute to changes in migratory flows prompted by the reform itself. The concern, anticipated when discussing the empirical strategy, is that the amount and composition of individuals applying for a visa, or an extension, or even leaving the UK could have been changed after April 2015 and thus bias obtained results away from the true impact of the reform. This is particularly concerning in this particular case, since most of the outcome variables are not part of the survey every year and it is crucial to be able to observe what happened in terms of migration in and out of the UK in the span around the reform cut-off. To do so, I use

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[27] Note that the outcome is on self-reported state of health: when talking about state of health it is important to keep in mind that every evaluation on state of health comes from respondents' personal self-assessment of their health condition at time of interview.

immigration data from the UK Home Office[28] on visa applications and outcomes, extensions of leave to remain and returns. Data are available up until the second quarter of 2022 and divide visas in different categories, mainly study, work, visitor and family reunification. Figures 1 show trends for visa applications and outcomes, extensions and returns. It is noticeable how, in terms of applications for visa to enter the UK, there is no change to previous trends in the period corresponding to the second quarter of 2015 (April 2015). Also, in terms of outcomes of applications, where Figure 1.II shows the trend of positive outcomes, where applicants are granted leave to enter the UK, nothing seems to change drastically after April 2015. When looking at grants of extensions to stay in the UK, the concern is to find a sharp decrease after the first quarter of 2015 due to individuals who cannot sustain the advance cost of health (since extensions of visa now requires payment of the immigration health surcharge). This does not seem to happen, according to Figure 1.III: grants of extensions on the ground of family reasons slightly increase around the cut-off, but it is coherent with an increasing trend and the only recognizable sudden changes in previous trends occur for all types of visas in the last quarter of 2019, years away from the implementation of the NHS Cost Recovery Plan effective in 2015. I also look at returns, since the patterns of individuals leaving the UK can be informative of whether abrupt surges or drops in outflux of migrants could tamper the results of my analysis. Figure 1.IV shows that is unlikely to be the case.

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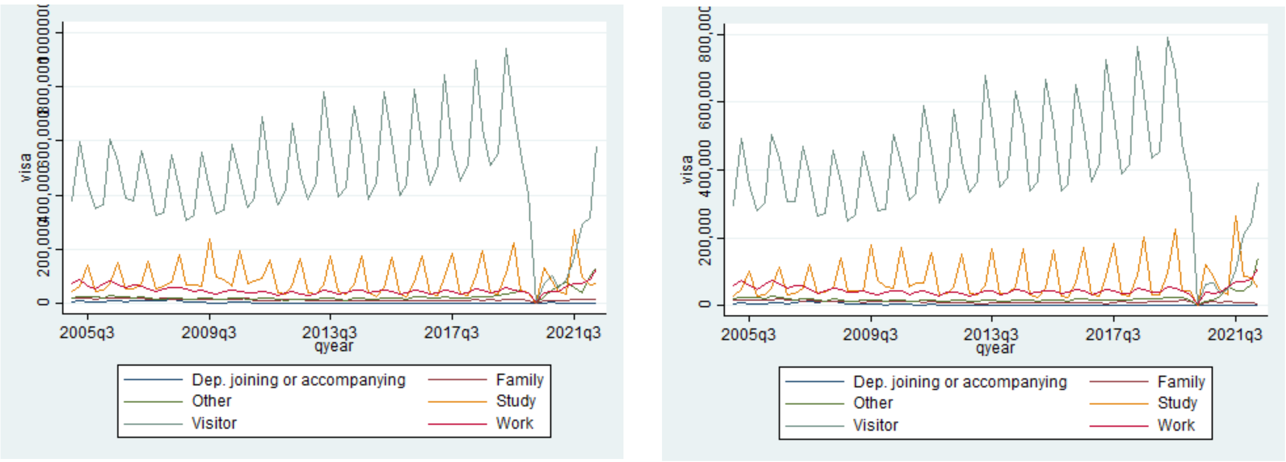
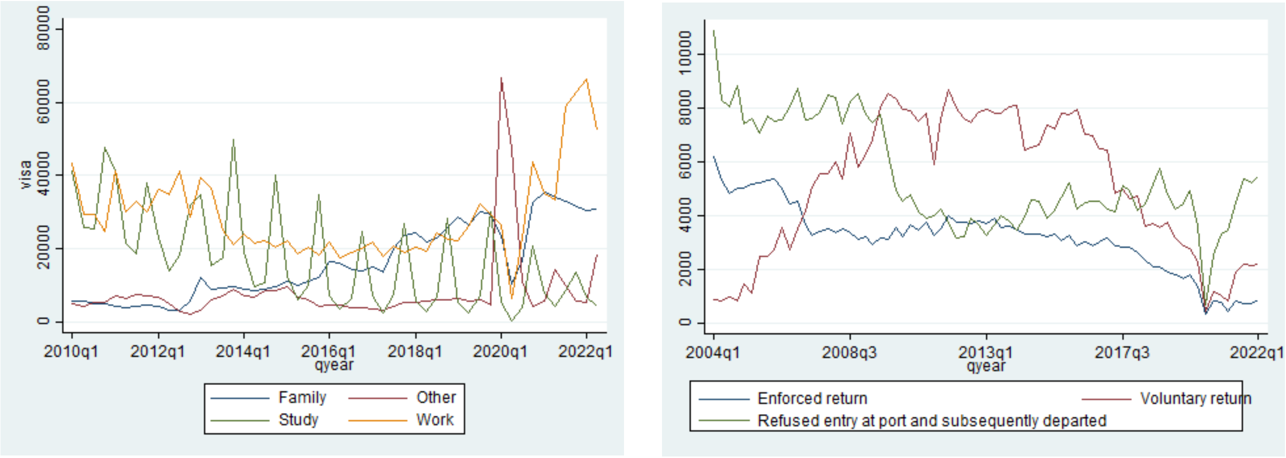
[28] Available at Immigration statistics data tables, year ending June 2021 - GOV.UK (www.gov.uk), last accessed on November 2022.

Figure 1. Immigration Statistics (Home Office)



I. Applications for entry clearance visas

II. Outcomes of applications: Issued visas



III. Grants of extensions of stay in the UK

IV. Returns

8 Conclusion

This paper provides insight on the impact that reformation at NHS level for regulating eligibility to treatment and access to care for non-EEA temporary migrants has had on their actual utilization of health care. I exploit a change in policy effective from April 2015, namely the NHS Act 2014. The act sanctioned the condition of health entitlements on immigration status and introduced the immigration health surcharge, which temporary migrant from outside the EEA have to pay contextual with their visa application in order to be able to access NHS services the same way as ordinary residents. I investigate the effect of the act on several outcomes of utilization of medical services (primary care, secondary out-patient and in-patient treatment) and indicators of state of health and satisfaction with personal health conditions. At first look, there seems to be no significant impact on the use of health care by migrants in the UK, both at the extensive margin (incidence of access) and at the intensive margin (frequency of access). This apparently seems to contradict qualitative and mixed-methods evidence highlighting the detrimental effects on migrant health of linking eligibility to care to proof of migration status (Fox and Hiam, 2018; Weller et al., 2019; Potter et al., 2020). The only sizeable and consistent effect is an increase in satisfaction with health, possible indicator of how non-EEA migrants complying with the payment of the surcharge feel about the system in place for them to access medical services when needed. Other coefficients, despite not being significant, suggest other directions of the effect: self-reported state of health tends to decrease after the NHS reform, and measures of frequency of primary care visits and out-patient care treatment goes in the same direction. It is not possible to draw any conclusions on these results due to their lack of statistical analysis (which could be due in turn to the less-than-ideal size of the sample and the treated group and/or to the negligible size of the effect), but the direction suggests that indeed the reform could have had a detrimental impact on individuals' health by hindering their frequency of access to needed services. It is also worth remembering that one of the rationales behind the reform was indeed the perceived need to reduce the pressure of overutilization of medical services by non-citizens on providers of care (*Visitor & Migrant NHS Cost Recovery Programme - Implementation Plan 2014–16*, 2014). The direction of non-significant coefficient seems to indicate that this aim could have brought about repercussions in terms of migrants' health. The analysis proceeded looking at sub-samples of treated migrants, to detect if the reform had any significant and sizeable effect on specific categories. Significant detrimental effects are visible for women, namely in terms of worse self-reported health and diminished frequency of visits to the GP and to the hospital. This is in line with evidence reported in existing empirical papers focusing on the health of migrant women in the UK: migrant women, especially mothers, are particularly sensible to barriers in place for utilization of health care (Phillimore, 2016; Jayaweera & Quigley; 2010). Also in terms of age, heterogeneity analysis identified younger respondents (aged 15 to 25) as those most seriously impacted by the reform. Younger migrants tend to access less primary care and out-patient care and report worse levels of health; this last effect could be resulting from the diminished frequency of access to care and possibly exacerbation of conditions that could be taken care of with preventive or primary care treatment. With the data at hand, it is not possible to assess whether reducing the pressure on primary and emergency care by placing barriers for some potential patients has had the desired effect of reducing the workload of medical professionals and limiting counterproductive over-crowding of clinics and hospitals, so that they can provide a better service for the patients that do access care. What emerges from this analysis is that the effect of placing barriers has caused a decrease in the frequency of access to care, especially for some categories of migrants (youth and women) and has brought about a worsening of their self-perceived health. Overall, evidence from the DiD model appears to confirm the dangerous effects generated by legislative and administrative changes that create a “hostile environment” for accessing adequate care (Bragg et al., 2019).

As a complementary analysis, I used data from the immigration statistics collected by the Home Office on applications for entry clearance visas, grants of visas and of extensions of stay in the UK and returns to verify whether any of the effects previously detected should be imputed to drastic changes in the size and composition of migratory flows to the UK triggered by the reform or any other event occurring in the same time span. Evidence from the analysis of time trends suggest that the results of the DiD model are unlikely to suffer from bias due to sudden change in in and out migratory flows. Even though the results from this empirical analysis are inherently linked to the geographical context and does not necessarily hold for other groups of migrants in other receiving countries, it constitutes an important empirical assessment of a change in policy concerning the link between immigration status and health rights.

Appendix

Table A.1. Effects of NHS reform on health outcomes – by age

	(1) Use of local doctor	(2) Use of out-patient care	(3) Use of in-patient care	(4) No. visits to GP	(5) No. hospital visits (out-patient care)	(6) State of health	(7) Satisfaction with health
Panel A: 15-25 years							
Non-EEA temporary migrants * post 2015	.369	.667	.028	-1.097***	-.625***	2.699***	2.523
	(.876)	(.768)	(.045)	(.188)	(.16)	(.951)	(1.642)
Observations	1127	1127	1827	1827	1827	4600	4600
R-squared	.546	.56	.039	.078	.051	.052	.1
Panel B: 26-39 years							
Non-EEA temporary migrants * post 2015	-1.473	-1.245	-.109	-.01	-.218	.648	2.731***
	(1.278)	(1.296)	(.275)	(.649)	(.756)	(.577)	(.939)
Observations	3199	3199	5227	5227	5227	13540	13540
R-squared	.381	.373	.03	.03	.027	.043	.036
Panel C: 40-55 years							
Non-EEA temporary migrants * post 2015	.77	.398	-.225*	-2.963	-.32	1.387	6.188***
	(.834)	(.854)	(.124)	(1.818)	(1.387)	(1.569)	(1.978)
Observations	4430	4430	8332	8332	8332	16860	16860
R-squared	.434	.433	.009	.028	.012	.046	.04
Panel D: over 55 years							
Non-EEA temporary migrants * post 2015	-	-	2.48**	.172	-3.25	.287	-1.202
	-	-	(1.258)	(11.955)	(10.176)	(3.463)	(4.111)
Observations	3342	3342	6843	6843	6843	12575	12575
R-squared	.499	.491	.007	.057	.059	.04	.027
Year Dummy	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES
Group Trends	YES	YES	YES	YES	YES	YES	YES

Robust standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Table A.2. Effects of NHS reform on health outcomes – by ethnicity

	(1) Use of local doctor	(2) Use of out-patient care	(3) Use of in-patient care	(4) No. visits to GP	(5) No. hospital visits (out-patient care)	(6) State of health	(7) Satisfaction with health
Panel A: Indian							
Non-EEA temporary migrants * post 2015	1.298	1.233	-.08	.967***	.805***	.236	2.097
	(.919)	(1.147)	(.087)	(.235)	(.164)	(.984)	(1.624)
Observations	2170	2170	3486	3486	3486	8548	8548
R-squared	.376	.368	.013	.021	.015	.051	.051
Panel B: Pakistani							
Non-EEA temporary migrants * post 2015	-3.393	-3.559	.364***	.864**	1.161***	-2.253*	-1.451
	(2.77)	(2.721)	(.135)	(.411)	(.196)	(1.26)	(1.902)
Observations	1580	1580	2568	2568	2568	6062	6062
R-squared	.34	.343	.015	.044	.019	.061	.058
Panel C: Bangladeshi							
Non-EEA temporary migrants * post 2015	-.165	-.115	187.526	618.829**	400.413	2.182	6.574
	(.415)	(.446)	(129.094)	(302.398)	(524.49)	(3.006)	(4.493)
Observations	1123	1123	1661	1661	1661	4399	4399
R-squared	.164	.156	.038	.038	.034	.101	.068
Panel D: Chinese							
Non-EEA temporary migrants * post 2015	-	-	-.002	1.17***	1.3***	3.283	.227
	-	-	(.029)	(.104)	(.084)	(2.757)	(4.243)
Observations	333	333	459	459	459	1314	1314
R-squared	.334	.332	.098	.045	.132	.109	.084
Year Dummy	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES
Group Trends	YES	YES	YES	YES	YES	YES	YES

Robust standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Table A.3. Effects of NHS reform on health outcomes – England vs Rest of the UK

	(1) Use of local doctor	(2) Use of out-patient care	(3) Use of in-patient care	(4) No. visits to GP	(5) No. hospital visits (out-patient care)	(6) State of health	(7) Satisfaction with health
Panel A: England							
Non-EEA temporary migrants * post 2015	-1.47	-1.332	.002	-.354	-.124	.715	2.986***
	(1.036)	(1.049)	(.025)	(.244)	(.135)	(.509)	(.784)
Observations	11551	11551	20238	20238	20238	45415	45415
R-squared	.424	.419	.004	.021	.012	.039	.039
Panel A: Rest of UK (Wales, Scotland, Northern Ireland)							
Non-EEA temporary migrants * post 2015	-3.429**	-3.879**	0	1.391	1.988*	.237	.498
	(1.715)	(1.752)	(.46)	(1.648)	(1.104)	(1.46)	(1.99)
Observations	547	547	1991	1991	1991	2160	2160
R-squared	.566	.56	.02	.064	.042	.064	.037
Year Dummy	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES
Group Trends	YES	YES	YES	YES	YES	YES	YES

Robust standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

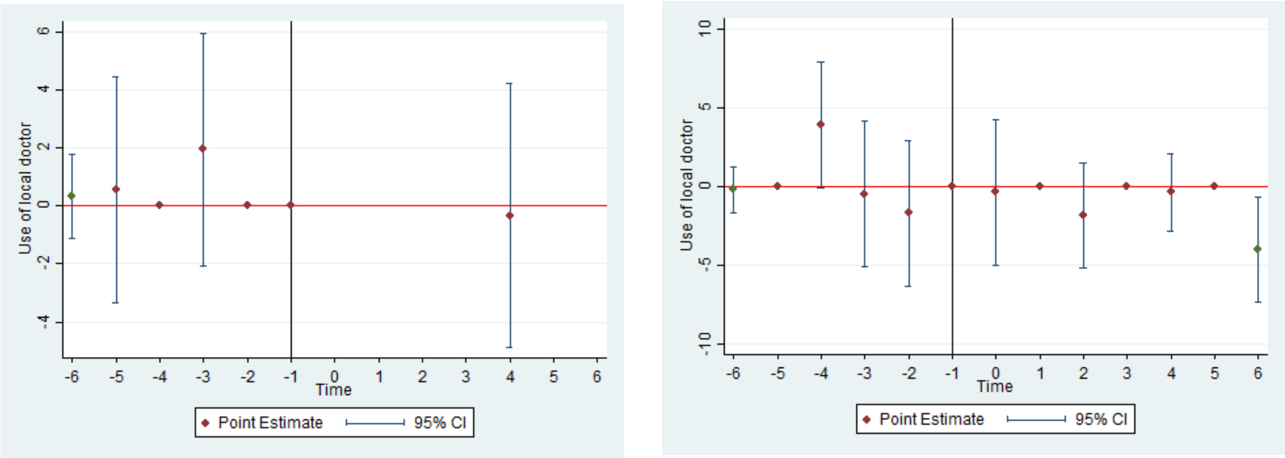
Table A.4. Effects of NHS reform on health outcomes – Placebo Cut-Offs

	(3) Use of in-patient care	(4) No. visits to GP	(5) No. hospital visits (out-patient care)	(6) State of health	(7) Satisfaction with health
Panel A: Males					
Non-EEA temporary migrants * post 2010	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)
Observations	9494	9494	9494	20879	20879
R-squared	.03	.023	.007	.037	.035
Non-EEA temporary migrants * post 2011	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)
Observations	9494	9494	9494	20879	20879
R-squared	.03	.023	.007	.037	.035
Non-EEA temporary migrants * post 2012	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)
Observations	9494	9494	9494	20879	20879
R-squared	.03	.023	.007	.037	.035
Non-EEA temporary migrants * post 2013	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)
Observations	9494	9494	9494	20879	20879
R-squared	.03	.023	.007	.037	.035
Panel A: Females					
Non-EEA temporary migrants * post 2010	0	0	0	0***	0
	(0)	(0)	(0)	(0)	(0)
Observations	12735	12735	12735	26696	26696
R-squared	.031	.015	.008	.041	.039
Non-EEA temporary migrants * post 2011	0	0	0	0***	0
	(0)	(0)	(0)	(0)	(0)
Observations	12735	12735	12735	26696	26696
R-squared	.031	.015	.008	.041	.039
Non-EEA temporary migrants * post 2012	0	0	0	0***	0
	(0)	(0)	(0)	(0)	(0)
Observations	12735	12735	12735	26696	26696
R-squared	.031	.015	.008	.041	.039
Non-EEA temporary migrants * post 2013	0	0	0	0***	0
	(0)	(0)	(0)	(0)	(0)
Observations	12735	12735	12735	26696	26696
R-squared	.031	.015	.008	.041	.039
Year Dummy	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES
Group Trends	YES	YES	YES	YES	YES

Robust standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

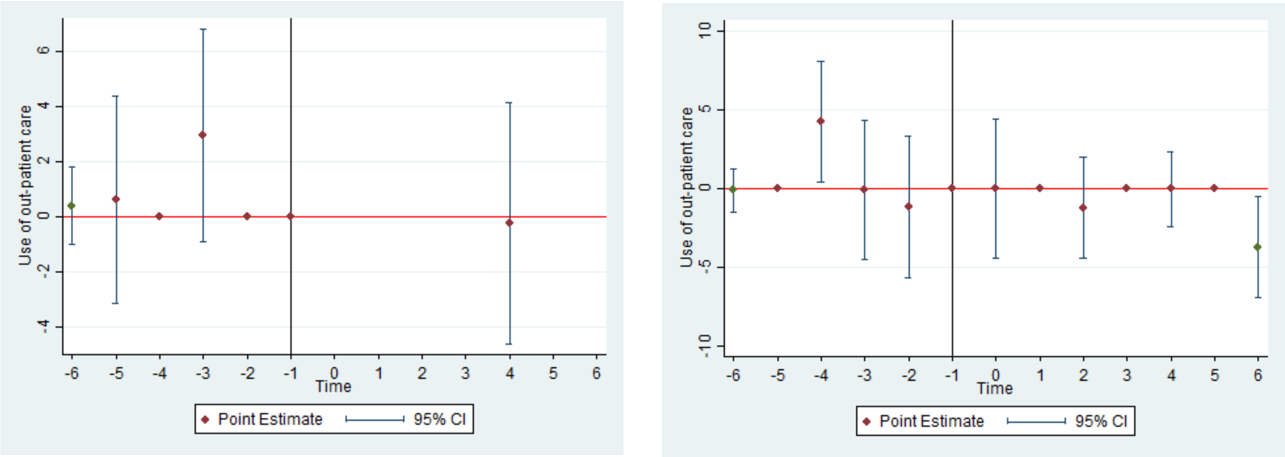
Figure A.1. Effect by Year: Use of local doctor by Gender



Males

Females

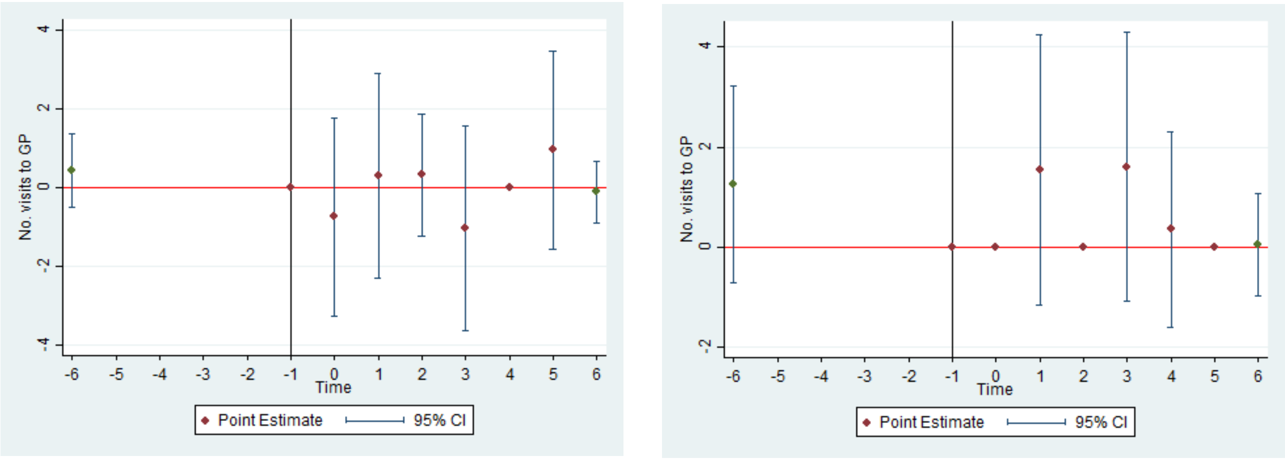
Figure A.2. Effect by Year: Use of out-patient care by Gender



Males

Females

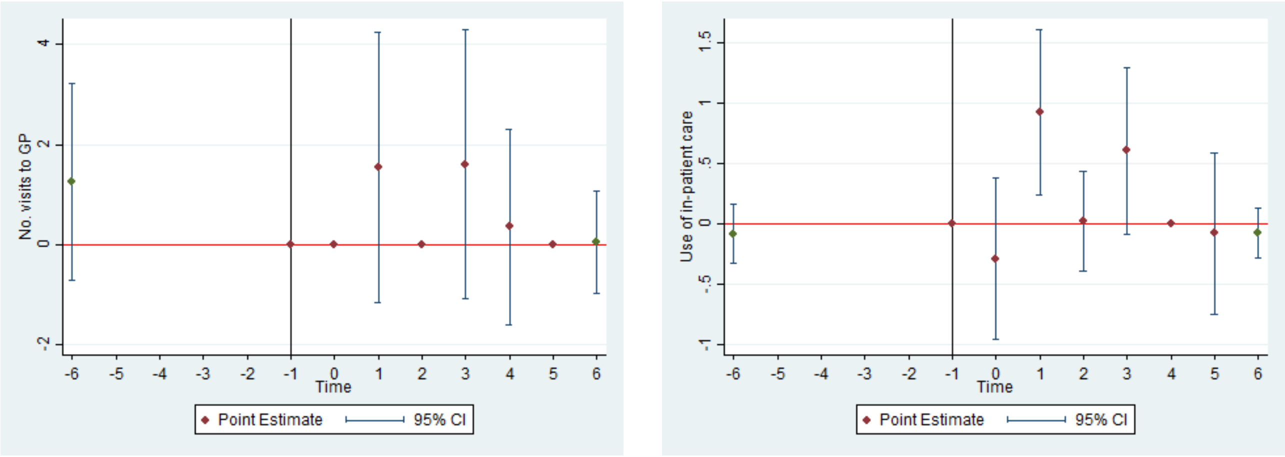
Figure A.3. Effect by Year: Use of in-patient care by Gender



Males

Females

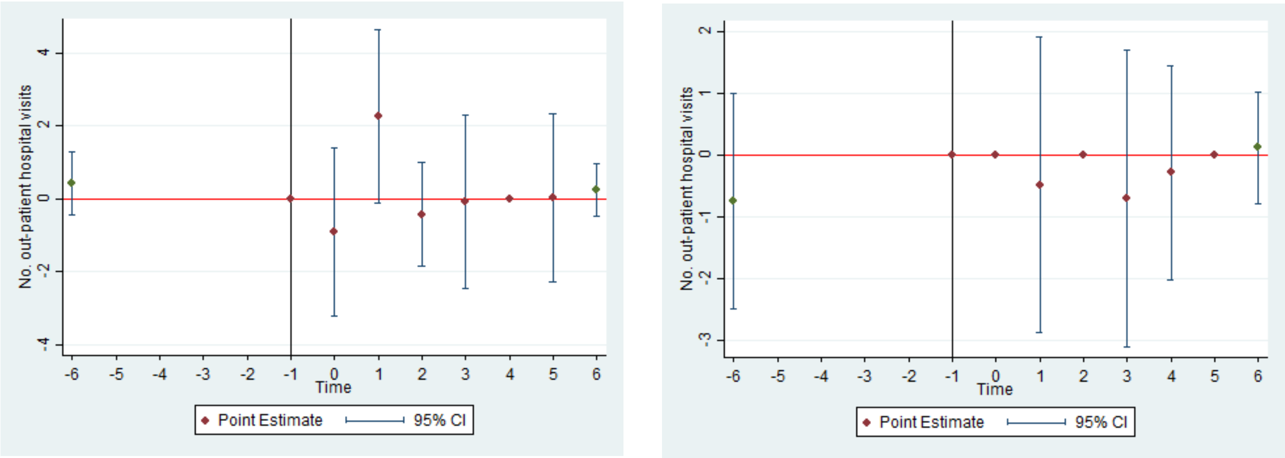
Figure A.4. Effect by Year: No. visits to GP by Gender



Male

Females

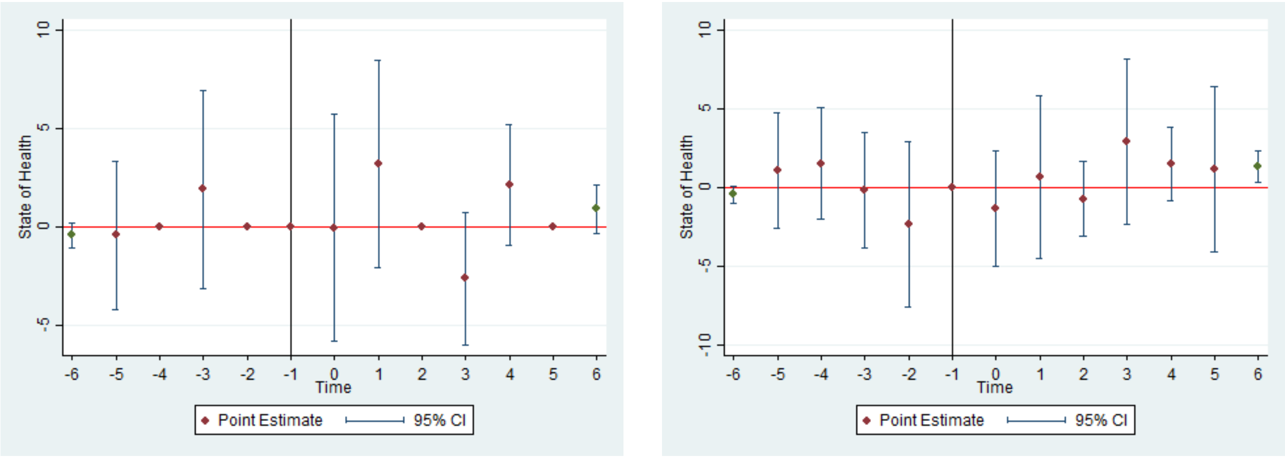
Figure A.5. Effect by Year: No. visits to out-patient care by Gender



Males

Females

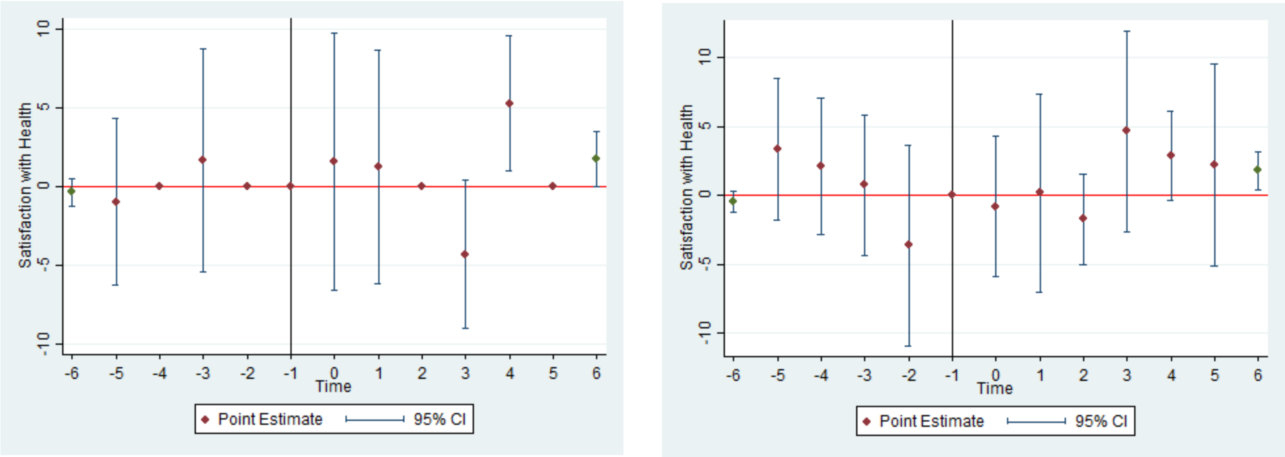
Figure A.6. Effect by Year: State of Health by Gender



Males

Females

Figure A.7. Effect by Year: Satisfaction with Health by Gender



Males

Females

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