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ABSTRACT

The Effects of Immigration on NHS Waiting Times*

This paper analyses the effects of immigration on waiting times in the National Health Service (NHS) in England. Linking administrative records from the Hospital Episode Statistics (2003-2012) with immigration data drawn from the UK Labour Force Survey, we find that immigration reduced waiting times for outpatient referrals and did not have significant effects on waiting times in Accident and Emergency (A&E) and elective care. These results are explained by the fact that immigration increases natives' internal mobility and that immigrants tend to be healthier than the natives moving to different areas. On the contrary, we show that outpatient waiting times tend to increase in areas where native internal migrants moved into. Finally, we find evidence that immigration increased waiting times for outpatient referrals in more deprived areas outside London. The increase in average waiting times in more deprived areas is concentrated in the years immediately following the 2004 EU enlargement and vanished in the medium-run (e.g., 3 to 4 years).

JEL Classification: I10, J61

Keywords: immigration, waiting times, NHS, access to health care, welfare

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1 Introduction

The impact of immigration on the welfare of host country residents has long been a contentious topic. In the UK, a majority of the public has been opposed to more immigration since at least the 1960s and a majority also perceives the costs of immigration to be greater than the benefits (Blinder, 2012). The EU enlargement of 1 May 2004 exacerbated this debate as citizens of eight new members states (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia), commonly referred to as the A8, were granted immediate unrestricted right to work in the country. The UK was only one of three EU countries, along with Ireland and Sweden, which opened labour markets to A8 citizens immediately upon accession, a decision which led to a substantial immigrant inflow to the UK.

Previous papers have analysed the effect of immigration in the UK on public finances (Dustmann et al., 2010; Dustmann and Frattini, 2014), labour markets (Dustmann et al., 2013), the housing market (Sá, 2015) and crime (Bell et al., 2013), among others. We know less about the effects of immigration on the National Health Service (NHS). Residents of the UK, including immigrants, have free access to the NHS. This free access has resulted in speculation that immigrants may increase the demand for NHS services disproportionately and that in some cases immigrants move to the UK with the explicit purpose of abusing the health care system. These arguments and the potential health care costs associated with immigration have resulted in the introduction of a NHS surcharge for non-EU citizens applying for a UK visa.

Despite the intense political debate on the impact of immigration on the NHS, research on the topic has been limited by the paucity of data. Wadsworth (2013) using longitudinal data from the British Household Panel Survey finds that immigrants use hospital and general practice services at broadly the same rate as the UK-born. Steventon and Bardsley (2011) provide evidence suggesting that the view that immigrants use more secondary care than British natives may be unfounded. While these are valuable findings, these studies do not provide information on the impact of immigration on NHS efficiency. Waiting times are an important measure of quality and productivity of a public health care system (Castelli et al., 2007; Gaynor et al., 2012; Propper et al., 2008). This paper aims to provide insights on this impact by looking at NHS waiting times.

Waiting times function as a rationing mechanism in the NHS and play the role of a price

(Lindsay and Feigenbaum, 1984). Research suggests that waiting times are one of the leading factors of patient's dissatisfaction with the NHS (Appleby, 2012; Sitzia and Wood, 1997; Propper, 1995). Postponing treatment delays the benefits associated with it and can have negative effects on patient health (Siciliani and Iversen, 2012; Cullis et al., 2000). Average waiting times for some NHS services were considerably high during the 2000s. British politicians have suggested that increased immigration was a key factor contributing to NHS waiting times.

Between 1993 and 2013 the number of foreign-born residents of the UK more than doubled from 3.8 million to around 7.8 million (Rienzo and Vargas-Silva, 2012). This increase in the stock of immigrants is likely to have directly increased the demand for healthcare services. Immigration also affects the demographic composition and population morbidity rates, two factors that have key repercussions for the demand for healthcare. These effects of immigration are likely to vary significantly by location as there is substantial variation across local authorities in both the share of immigrants and NHS capacity.

Using a basic theoretical framework, this paper investigates the effects of immigration on waiting times in the NHS. We consider waiting times in outpatients (referrals), elective care and A&E. We exploit a unique dataset built by merging administrative records and survey data. To the best of our knowledge there are no studies that have directly looked at the impact of immigration on NHS waiting times. The purpose of this paper is to fill this gap in the literature.

Following previous studies on the effects of immigration in the UK (Sá, 2015; Bell et al., 2013), we analyse the correlation between spatial variation in the immigrant inflows and waiting times across local authorities in England. We use immigration data at the local authority level drawn from the special license access version of the UK Labour Force Survey (LFS), obtained via an agreement with the Office of National Statistics (ONS). The dataset used in the estimations covers 141 local authorities in England. To study the effects of immigration on waiting times in the NHS, we merge this information with administrative records drawn from the Hospital Episodes Statistics (HES) provided by the Health and Social Care Information Centre (HSCIC).

As waiting times are not based on socio-economic status, these are usually viewed as an equitable rationing mechanism in publicly-funded healthcare systems. However, research provides evidence of marked inequalities in waiting times across socioeconomic status (Cooper et al., 2009; Laudicella et al., 2012; Propper et al., 2007). We also analyse differences in our results by level

of deprivation of the area in order to explore dissimilarities across areas regarding the impact of immigration.

To address the concern that immigration may be endogenous to the demand for health services and correlated with unobserved determinants of waiting times in the NHS, we used an instrumental variable approach exploiting the fact that historical concentrations of immigrants are a good predictor of current immigrant inflows. By including local area and year fixed effects, and controlling for local time-varying characteristics, we can reasonably assume that past immigrant concentrations are uncorrelated with current unobserved shocks that could be correlated with demand for health care services.

Though the political debate has mostly focused on the possible effects of immigration on A&E, we find no evidence of significant effects on waiting times in A&E and elective care. Furthermore, we find a reduction in waiting times for outpatients. In particular, we show that an increase in the stock of immigrants equal to 10% of the local initial population leads to a 19% reduction in outpatient waiting times.

To investigate the mechanisms underlying the negative effect of immigration on waiting times we analyse the effects of immigration on native mobility, average morbidity in the population and healthcare supply. Consistent with previous studies we show that immigration increases natives' likelihood to move to different local authorities. Our analysis also confirms that recent cohorts of immigrants are relatively young and healthy upon arrival ("healthy immigrant effect"), suggesting the demand may have increased less than predicted by the NHS (Sá, 2015; Wadsworth, 2013; Steventon and Bardsley, 2011). These effects on mobility and population composition are likely to explain the observed reduction in waiting times. Meanwhile, we find that the supply of healthcare is not affected by immigration.

We also find that waiting times increased in areas where native internal migrants moved into and that immigration increased the average waiting time for outpatients living in deprived areas outside London in the period immediately following the 2004 EU enlargement. Our findings suggest that the short-run increase of outpatient waiting times in deprived areas in response to immigration can be explained by both the lower mobility of incumbent residents in these areas and the higher morbidity observed among immigrants moving into more deprived areas.

This paper is organised as follows. Section 2 presents the theoretical framework. Section

3 provides a discussion of the empirical specification, the identification strategy and the data. Section 4 presents the main results of the paper. Section 5 discusses the potential mechanisms explaining our main findings. We then illustrate the the heterogeneity of the results across England in section 6 and present robustness checks in section 7. Concluding remarks are reported in section 8.

2 Theoretical framework

We illustrate the relationship between immigration and waiting times using a basic model of the demand and supply of health care services. Our model builds on Lindsay and Feigenbaum (1984); Windmeijer et al. (2005); Martin et al. (2007); Siciliani and Iversen (2012). We extend the model to explicitly incorporate the effects of immigration. Unless admitted through A&E, all patients are referred by their GP to access NHS elective care. If patients get a referral they join the waiting list for outpatients. The specialist can decide whether the patient needs elective hospital care, in which case the patient will be placed on the waiting list for hospital admission.

Patients can alternatively look for private care or renounce and get no care at all if waiting time becomes too long. The demand for NHS care at time t will depend on the expected waiting time (w^p), on various demand shifters (x_t^d) such the health needs of the population (e.g. morbidity), the proportion of elderly, the overall size of the population, and other variables (z_t) that may affect both the supply and demand of healthcare services (e.g., the quality of NHS care, the level of competition).

Formally, the demand function (D_t^j) for outpatients visits by practice j a time t and the total number of patients added to the outpatient waiting list (D_t) will be:

$$D_t^j = (w_t^p, x_t^d, z_t) \tag{1}$$

$$D_t = \sum_j D_t^j \tag{2}$$

$$w_t^p = w_{t,OV}^p + w_{t,IA}^p + w_{t,DA}^p \tag{3}$$

where w_t^p is patient's expected waiting time (the sum of the waiting time for outpatient visits (OV), elective inpatient admission (IA), and daycase elective admissions (DA) for those added to the NHS list in period t. The supply will be a function of waiting time, demand shifters and exogenous supply shifters (e.g., a policy change). An increase in the number of immigrants (IMM) may shift the demand by affecting the population size as well as by changing its demographic composition and health needs.

Following Gravelle et al. (2003), the supply decisions are taken by hospital manager who maximize their utility function at time t:

$$u_t = u(S_t, w_t^m; w_{t-1}^m, x_t^s, z_t) \tag{4}$$

where S_t is the supply of care in period t, w_t^m is the manager's perception of the period t waiting time, w_{t-1}^m captures the effect of past performance on managers' utility, and x_t^s is a vector of supply shifters including the number of doctors, hospital bed availability, and the type of hospital. The manager's forecast of waiting time at time t is a function of waiting lists (L_{t-1}) at time $t-1$, the demand at time t (D_t) and supply at time t (S_t).

$$w_t^m = f(S_t, L_{t-1}, D_t(w_t^p, x_t^d, z_t) \tag{5}$$

The waiting list for different types of care (outpatient visits, inpatient and daycase elective admissions) evolves as:

$$L_{kt} = L_{kt-1} + D_{kt} - k_t - \delta_{kt}, \quad k = OV, IA, DA \tag{6}$$

where δ_{kt} is the number of patients leaving the waiting list. As in Windmeijer et al. (2005), we assume that decisions on emergency admissions and on the first three types of care are taken by different decision makers. Optimal supply in period t is:

$$u(S_t, w_t^m; w_{t-1}^m, x_t^s) + \lambda_t V(L_t + D_{t+1}, w_t^m, x_t^s) \tag{7}$$

where λ_t is the manager's discount rate.

$$S_t^* = S(L_{t-1}, w_{t-1}^m, D_t, x_t^s, z_t, \lambda_t) = S_t^*(L_{t-1}, w_{t-1}^m, w_t^p, x_t^s, x_t^d, z_t, \lambda_t) \tag{8}$$

In equilibrium, health care demand equals the supply of health care. The sign of the effect of immigration on waiting times is ambiguous. An increase in the number of immigrants will affect demand and supply through its effects on demand shifters (x_t^d), patient's and manager's expected waiting time, and through its effects on the supply of health care personnel. The effect on waiting times will tend to be positive if the increase in the immigrant population is not offset by an increase in the supply. In the short run, managers may be constrained by the annual budget setting process. Also, as managers forecast waiting times depend on the predicted change in population based on what was observed at $(t-1)$, unexpected immigration inflows may result in excess demand. As such, the supply may not adjust immediately because of differences between predicted and actual inflows or because of budget constraints. On the other end the effect could be negative if the supply increases more than the actual demand for health care services. This may occur if immigration leads natives to move to and/or seek care in different areas or in the private sector and if immigrants have lower incidence of morbidities or, more generally, demand less health care services. If, as in Sá (2015), natives with higher income are more likely to move (or seek private care) as a response to immigration inflows, one may expect the negative effect of native out-migration on waiting times to be amplified in less deprived areas. One may instead expect larger positive effects of immigration on waiting times in areas where the demand for health care services is less elastic (higher mobility costs) or in areas that attract less healthy immigrants.

Following Siciliani and Iversen (2012), we can describe the demand and supply function in the following way:

$$Y_i^d = \alpha_0 + \alpha_1 w_i + \alpha_2 x_i^d + \alpha_3 z_i + e_i^d \tag{9}$$

$$Y_i^s = \beta_0 + \beta_1 w_i + \beta_2 x_i^s + \beta_3 z_i + e_i^s \tag{10}$$

where Y_i^d and Y_i^S are the demand and supply of health care in area i and w_i is the waiting time.

Under the equilibrium assumption Y_i^d=Y_i^S, we can write the waiting time as a function of demand and supply shifters:

$$w_i = \gamma_0 + \gamma_1 x_i^d + \gamma_2 x_i^s + \gamma_3 z_i + e_i \tag{11}$$

where

$\gamma_0 = \frac{\alpha_0 - \beta_0}{\beta_1 - \alpha_1}$, $\gamma_1 = \frac{\alpha_2}{\beta_1 - \alpha_1}$, $\gamma_2 = \frac{-\beta_2}{\beta_1 - \alpha_1}$, $\gamma_3 = \frac{\alpha_3 - \beta_3}{\beta_1 - \alpha_1}$.

We can adapt this framework to analyse the effects of immigration as an exogenous shock to the demand for healthcare services. Formally,

$$w_{it} = \lambda_0 + \lambda_1 IMM_{it} + \lambda_2 X_{d,it} + \lambda_3 X_{s,it} + \lambda_4 Z_{it} + \mu_i + \eta_t + e_{it} \tag{12}$$

where w_{it} is the average waiting time in local area i, λ_1 capture the effect of an increase in the number of immigrants living in local area i on waiting times, λ_2 (λ_3) are the parameters associated to vector of variable controlling for other demand (supply) shifters, λ_4 captures the effects of variables affecting both the supply and demand for healthcare services, μ_i and η_t are the health local area (i.e. Primary Care Trust (PCT))[1] and time fixed effects.

3 Data and Empirical Specification

3.1 *Data*

We use information on the immigrant population by local authority and year drawn from the special license of the UK LFS, between 2003 and 2012. We define immigration based on country of birth and pool quarters for each year.

Data on waiting times are extracted from the HES database provided by the HSCIC. The HES dataset includes patients treated by the publicly-funded NHS in England. The HES database is a records-based system that covers all NHS trusts in England, including acute hospitals, primary care trusts and mental health trusts. We extracted data on waiting times and basic population demographics from the HES at the lower super output area (LSOA) level. Furthermore, we

[1]PCTs were largely administrative bodies, responsible for commissioning primary, community and secondary health services from providers until 2013. PCTs were replaced by clinical commissioning groups on 31 March 2013 as part of the Health and Social Care Act 2012.

use data at the PCT level from the HES and HSCIC databases on the supply side, including information on the number of GPs, number of GP practices, number of specialists, the ratio of occupied beds in the PCT hospitals, the annual NHS expenditure and the number of doctors with a foreign-degree.

The HES dataset provides counts and time waited for all patients admitted to a hospital (inpatients, outpatients and A&E). For outpatients and inpatients, we restrict the analysis to first admissions and exclude maternity data. Data on waiting times for outpatients and elective care are available for the entire period under analysis (2003-2012), while in the HES dataset we only have data on A&E from 2007 onwards. Waiting times for outpatients are defined as the number of days a patient waits from referral date to the appointment with the specialist; waiting times for elective care are defined as the period between the date of the decision to admit and the date of actual admission. For the A&E department, waiting times are defined as the minutes from the arrival of a patient in the A&E room and the decision of transfer, admission or discharge the patient. We have calculated the average waiting time for outpatients, elective care and A&E by LSOA of patient's residence.

The merged sample includes 32,483 LSOAs, 141 local authorities, 150 PCTs, and 16 regions of residence in England. Table 1 presents the summary statistics on waiting times, immigration share and a vector of variables affecting the demand and supply of health care services. For the 2003-2012 period the average waiting times for outpatients was 47 days, while for inpatients was 70 days. Average waiting times for A&E was 52 minutes.

The native population of the UK has remained relatively stable for the last decade. In contrast, the foreign-born population increased continuously over the same period, with a sharp increase of individuals born in other EU countries. Figure 1 shows the growth in the foreign-born share of the population of England between 2003 and 2012. During that period the foreign-born share of the working-age population increased from 9% to 13%. European enlargements induced a sharp increase in the number of recent immigrants -defined as foreign-born people who have been living in the UK for 5 years or less- which increased from 2% to 4% of the population (Rienzo and Vargas-Silva, 2012). Another indicator of the growth in the migrant population is the trend in new immigrant GP registrations. As we can see in Figure 2 over the period 2004-2012 new immigrant GP registrations as a share of the total population in England increased from 0.9% in

2004 to 1.15% in 2010.

Waiting times decreased for outpatients and elective care for the period 2003-2012 and for A&E between 2007 and 2012 as reported in Figure 3. This could be the consequence of NHS policies. The NHS Plan in 2000 shifted the focus from the size of the waiting list to the maximum waiting times experienced by patients. The maximum wait for inpatient and day-case treatment was reduced from 18 to 6 months, while the maximum wait for an outpatient appointment was reduced from 6 to 3 months. However, as shown in Figure 3, there has been an increase in waiting times for elective care since 2008 (see also Appleby et al. (2014)).

3.2 *Identification Strategy*

To identify the effect of immigration on waiting times in the NHS, we exploit variation over time in the share of immigrants living in a local authority between 2003 and 2012. In our baseline specification, we estimate the following model:

$$w_{iplt} = \alpha + \beta S_{lt} + X'_{iplt}\gamma + Z'_{pt}\lambda + \mu_p + \eta_t + \epsilon_{iplt}, \tag{13}$$

Where w_{iplt} is the average waiting time for outpatient services in a lower layer super output areas (LSOA) i, belonging to the PCT p, and local authority l at time t; S_{lt} is the share of immigrants in local authority l at time t; X'_{iplt} is a vector of time-varying LSOA characteristics (index of deprivation and rural indicator); Z'_{pt} is a vector of time-varying characteristics at the PCT level, μ_p and η_t are PCT and years fixed effects, respectively; and ϵ_{it} captures the residual variation in waiting times.[2] To capture time-invariant characteristics that may be correlated with both waiting times and immigration inflows we control for PCT fixed effects.

The use of geographical variation in the share of immigrants (often called an "area approach") has been criticised by scholars (e.g., Borjas et al., 1996; Borjas, 2003) for two main reasons. First, natives may respond to the impact of immigration on a local area by moving to other areas. This is important in our study because healthier natives may be more likely to migrate. Following Borjas et al. (1996), we test the robustness of our results to the change of the geographical unit

[2] As the information on immigration is only available at the local authority level, we cannot control for LSOA fixed effects in the regression.

using a higher level of aggregation. Furthermore, we analyse the effects of immigration on native internal mobility and examine whether waiting times were affected by native internal inflows across local authorities.

The second critique to the area approach is that immigrants might endogenously cluster in areas with better economic conditions. To address the concern of a local unobserved shock affecting both native and immigrant labour demand, we adopt an instrumental variables approach. Following Altonji and Card (1991), Card (2001), Bell et al. (2013) and Sá (2015), we use an instrumental variable based on a "shift-share" of national levels of immigration into local authorities to impute the supply-driven increase in immigrants in each local authority.

In practice, we exploit the fact that immigrants tend to locate in areas that have higher densities of immigrants from their own country of origin, and we distribute the annual national inflow of immigrants from a given source country across the local authorities using the distribution of immigrants from a given country of origin in the 1991 UK Census. Using the distribution of immigrants in 1991, we reduce the risk of endogeneity because annual immigration inflows across local authorities might be driven by time-varying characteristics of the local authority that are associated with health outcomes.

Specifically, let us define F_{ct} as the total population of immigrants from country c residing in England in year t and $s_{cl,1991}$ as the share of that population residing in local authority l as of year 1991. We then construct $\hat{F}_{cit}$, the imputed population from country c in local authority l in year t, as follows:

$$\hat{F}_{clt} = s_{cl,1991} * \Delta F_{c,t} + F_{cl,1991} \tag{14}$$

and the imputed total share of immigrants as:

$$\hat{S}_{lt} = \sum_{c} \hat{F}_{clt} / P_{l,1991} \tag{15}$$

where $P_{l,1991}$ is the total population in local authority l as of 1991. Thus, the predicted number of new immigrants from a given country c in year t that choose to locate in local authority l is obtained redistributing the national inflow of immigrants from country c based on the distribution of immigrants from country c across local authorities as of 1991. Summing across all countries

of origin we obtain a measure of the predicted total immigrant inflow in local authority l in year t. The variation of $\hat{S}_{lt}$ is only driven by the changes in the imputed foreign population (the denominator is held fixed at its 1991 value) and is used as an instrument for the actual share of immigrants in local authority l at time t (S_{lt}).

One potential threat to the validity of this approach is that the instrument cannot credibly address the resulting endogeneity problem if the local economic shocks that attracted immigrants persist over time. However, this problem is substantially mitigated by including PCT fixed effects, and by controlling for the time-varying characteristics at the LSOA and PCT level; thus we can reasonably assume that past immigrant concentrations are not correlated with current unobserved local shocks that might be correlated with health. Under the assumption that the imputed inflow of immigrants is orthogonal to the local specific shocks and trends in labour market conditions after controlling for PCT and year fixed effects, and time-varying characteristics of LSOAs and PCTs, the exclusion restriction holds.

4 Results

4.1 *Waiting Times for Outpatients*

Table 2 presents the main results on the effects of immigration on waiting times for outpatients. In column 1, we report the OLS estimate controlling for year and PCT fixed effects. The coefficient is negative and statistically significant. An increase in the stock of immigrants equal to 10% of the initial local authority's population decreases the average waiting time for outpatients by approximately 3 days (6%, with respect to the mean of the dependent variable). The coefficient becomes non-significant when we include LSOA and PCT time-varying characteristics (column 2). Including LSOA population (column 3) does not substantially change the results suggesting that the negative association between immigration and waiting times is not correlated with changes in the LSOA size.

To take into account the endogeneity of immigrants distribution across local authorities, we then estimate 2SLS regression using the typical shift-share instrumental variable approach explained above. In the first-stage regression the F-statistic (17.11) is above the weak instruments threshold. Column 4 presents the second-stage estimates including only year and PCT fixed

effects. The coefficient diminishes by approximately 30% when including LSOA and PCT time-varying characteristics (column 5) but it is still negative and significant, suggesting that an increase in the stock of immigrants equal to 10% of the initial local authority's population would reduce the average waiting time for outpatients by approximately 9 days (19%, with respect to the mean of the dependent variable). Propper (1995) estimated that patients would be willing to pay GBP 80 (in 1991 prices) -roughly GBP 150 in 2013 prices- for a reduction of a month on a waiting list. If disutility from waiting list were to be linear one could estimate that a 10 days reduction in waiting time would be equivalent to GBP 37.5 in 2013 prices.

Again, including population size (column 6) does not change the results. Overall, these results suggest that immigration was associated with a reduction in the average waiting time for outpatients.

4.2 *Waiting Times in Elective Care*

In Table 3, we examine the effects of immigration on waiting times for elective care. The OLS estimate reported in column 2 -including LSOA time-varying characteristics, year and PCT fixed effects- suggests that immigration is negatively associated with waiting time for elective care. A 10 percentage points increase in the immigration share is associated with a 5 days reduction in the average waiting time for elective care (a 7% reduction with respect to the average waiting time for elective care observed in the sample). However, the 2SLS estimate presented in column 4 is positive and non-significant and the point-estimate suggests a relatively small effect (+2% with respect to the mean).

4.3 *Waiting Times in A&E*

Table 4 illustrates the effects of immigration on waiting times in A&E. Unfortunately, at the LSOA level we only have information for the years 2007-2012. There is no evidence that immigrants have an effect on A&E waiting times. OLS estimates are negative and non-significant. The 2SLS estimate (column 4) is positive, but non-precisely estimated. The point-estimates are small (waiting times are reported in minutes). However, these results should be considered with caution because the analysis does not include the 2003-2006 period in which the immigration

from the A8 countries to the UK surged.

5 Potential Mechanisms

The model presented above suggests that immigration may reduce waiting times by two main channels. Immigration may increase native internal mobility (see Sá (2015)). If immigration leads natives to move towards different local authorities, the size of the population in the local authority may not change and the demand for healthcare may not increase. Moreover, natives may also seek care in the private sector, decreasing the pressure on local authorities where immigration is surging. At the same time the recent immigrants cohorts are relatively young and healthy upon arrival because of the "healthy immigrant effect" (Kennedy et al., 2014), suggesting that they may demand less care than what the NHS predicted (Wadsworth, 2013; Steventon and Bardsley, 2011). If immigrants are healthier and/or less likely to seek care, then waiting times may decrease even if the supply did not adjust.

To understand the possible mechanisms behind the negative effect of immigration on waiting times we examine how immigration affected internal mobility and morbidity rates local authorities in England.

5.1 *Native mobility*

Hatton and Tani (2005) and Sá (2015) analysed the displacement effects of immigration in the UK. Hatton and Tani (2005) find that for every 10 immigrants arriving in a region, 3.5 natives leave to other regions. Sá (2015) using the UK LFS and focusing on working-age population finds even larger effects suggesting a 1 to 1 immigrant-native displacement. In Table 5, we replicate the same analysis of Sá (2015) focusing on the population 15 years of age and older.[3] As we are interested in the effects of immigration on the NHS it is important for us to consider the effects on the elderly who represent an important share of the demand of health care services. Overall, our results go in the same direction of Sá (2015) and if anything suggest an even larger displacement of natives. An increase in the stock of immigrants equal to 1% of the local initial population increases the native out-migration rate by 16 percentage points and the native in-mobility rate

[3]Information on the local authority of residence in the year before the interview is available in the LFS since 2004.

by 6.2 percentage points. As a result, native net out-migration rate increases by 9.7 percentage points. These results confirm that immigration leads natives to move towards different areas. This also explains why we find no differences in the effect of immigration on waiting times when we include population size as a control variable.

Native out-migration in response to immigration may increase demand for health-care services in the local areas that natives move into. As we can see in Table 6 (column 1) a 1 percentage point increase in the native population relative to the resident population in the previous year increases the average waiting time for outpatients by approximately 6 days (13% more with respect to the mean of the dependent variable). The coefficient diminishes when we include LSOA time-varying characteristics (column 2) and does not change substantially when we control for population size. The effect of native out-migration on waiting times for elective care and A&E was insignificant (not reported).

5.2 *Immigration and Health*

As returns to migration are higher for healthier individuals, immigrants are likely to self-select on health, along other dimensions (e.g. education, Palloni and Morenoff (2001); Jasso et al. (2004); Giuntella (2013)). Kennedy et al. (2014) show that this is particularly true for low-educated immigrants who have much better health outcomes than the average low-educated native.

Using individual data from the LFS (2003-2012), in Table 7, we analyse immigrant-native differences in health. The LFS contains questions on whether individuals had a health problem lasting more than 12 months, reported any disability[4], and on whether someone had days off work because sick or injured in the reference week.

Panel A, shows that foreign-born individuals are significantly less likely to report any health problem. In particular, the raw difference reported in column 1 shows that immigrants in England are 8 percentage points less likely to report a health problem lasting more than a year than their UK-born counterparts. This is equivalent to a 25% difference with respect to the mean of the dependent variable in the sample (32%). The difference becomes smaller once we account for age, education, gender and year fixed effects, indicating a 4.6 percentage points difference

[4]We include both individuals who have a long-term disability which substantially limits their day-to-day activities as well as those who have a long-term disability which affects the kind or amount of work they might do.

equivalent to a 15% of the mean (column 2). The coefficient remains stable when we include local authority fixed effects (column 3). In Panel B, we illustrate the difference in the likelihood of reporting any disability. On average, immigrants are 4.4 percentage points less likely to report any disability (column 1). The coefficient reduces to 2.8 percentage points once we account for socio-demographic characteristics, year fixed effects (column 2), and local authority fixed effects (column 3) pointing at a 12% difference with respect to the incidence of disability in the sample (22%). Immigrants are also less likely to have days off because of health problems. The conditional difference reported in column 3 of Panel C shows that foreign-born individuals are 17% less likely to be absent from work because of health problems than their UK-born counterparts. In Table 8, we restrict the native sample to individuals who resided in a different local authority in the previous year. Results show that immigrants tend to be healthier than native internal migrants. Consistent with previous literature on the healthy immigrant effect, the advantage is larger among recent cohorts of immigrants (columns 3-6).

These results are also confirmed when we use data from the Understanding Society survey (2009-2014). As shown in Table 9 Understanding Society data suggests that immigrants are less likely to report a poor health status, any health limitation, and any disability. This is in particular true for immigrants who arrived in England after 2000. The health immigrant advantage still remains when we control for sociodemographic characteristics such as gender, age, education, marital status, occupational category, region of residence, rural status, and year fixed effects. Given these findings it is unsurprising that immigrants are less likely to use health care services than natives.

Using the same Understanding Society sample, we also illustrate differences between immigrants and natives in health care use (see Table 10). Consistently with what previously shown by Wadsworth (2013) and Steventon and Bardsley (2011), we find that recent immigrants are significantly less likely than natives to have consulted a GP, and to have received treatment as outpatients or inpatients. Again the results hold when controlling for sociodemographic characteristics.[5]

[5]Dustmann and Frattini (2014) estimated that immigrants from the European Economic Area (EEA), in particular immigrants from countries that joined the EU in 2004, made a positive fiscal contribution. Our results suggest that their estimates may be downward biased as they estimate the proportion of health services expenditure attributable to each group based on the groups age structure, yet we show immigrants are healthier than natives in their same age group, even after controlling for socio-economic status and education.

As we can see in Panel C in Table 10 immigrants are overall more likely to use GP services. This is driven by earlier cohorts of immigrants. Recent cohorts are, on the opposite, less likely than natives to use GP services (column 3-6).[6] We obtain similar results using the General Household Survey (2002-2006). See Table A.1 in the Appendix for further details.

5.3 Immigration and the Supply of Health Care Supply

So far we have focused on the effects that immigration have on the demand for care and waiting times. However, immigration may also induce a right-ward shift of the supply, as many doctors and nurses come to the UK from overseas increasing the supply of health care personnel. In this section, we analyse how immigration affects the supply of health care services by focusing on the number of doctors, specialists, GP practices, ratio of occupied hospital beds to population, and average NHS expenditure.

The results presented in Table 11 suggest that there is no evidence of significant effects of immigration on the healthcare supply. As, the NHS supply may not adjust immediately to immigration, we also replicated the same estimates using a model with long differences (between years t and t-3) and confirm the lack of any significant effect on the supply side .[7]

The lack of significant effects of immigration on the supply of healthcare can have several explanations. First, the large majority of immigrants do not work in the NHS and this could affect the correlation between numbers and staff size. Second, many new immigrants working in the NHS could be substituting natives or other immigrants and may not necessarily increase the supply of NHS staff.

6 The Heterogeneous Impact of Immigration Across Local Authorities

The extent of immigrant health selectivity is likely to be different across local authorities in England. Figure 4 shows that both natives and immigrants in more deprived areas are more likely to report health problems lasting more than 12 months and a disability. Unsurprisingly, Table 12 shows that individuals living in areas with an IMD above the median are on average

[6]Note that information on doctor and hospital services are only available in the 4th wave of the Understanding Society.

[7]Results are available upon request.

less healthy than those living in less deprived areas. In particular, immigrants in deprived areas tend to be less favourably selected (see column 5 and 6).

There is evidence that migrants moving to less deprived areas are healthier than migrants who move to more deprived locations, increasing health inequalities across areas (Norman et al., 2005). This suggests that the effects of immigration on waiting times may be very different in deprived areas, particularly as these are areas where the supply tend to be more inelastic, where the population faces higher mobility costs, and waiting times tend to be longer (Laudicella et al., 2012).

In Table 13 we explore this further by estimating the impact of immigration on outpatient waiting times by level of deprivation of the area.[8] Results show that the negative effect on waiting times for outpatients is driven by less deprived areas. Columns 1-5 report the estimates of the main effect for LSOAs in the different quintiles of the IMD distribution. The table shows that the negative effect is largest (in absolute value) in the LSOAs in the less deprived areas (Q1) and lowest in the more deprived areas (Q5) with the coefficient decreasing monotonically along the IMD distribution.[9]

We also investigate whether there are any specific short-run effects of immigration in deprived areas and whether results are affected by the inclusion of London, the region that has the largest concentration of immigrants and health care supply in England. We find that results are affected by the exclusion of London and the focus on more deprived areas of England before 2008. In particular, columns 4-5 of Table 14 show that immigration had an heterogeneous impact across England and that, at least in the first years following the 2004 EU enlargement, immigration increased the average waiting time in deprived areas outside London. Column 4 shows that in the first three years after the 2004 EU enlargement, a 10 percentage points increase in the share of immigrants living in a local authority increased waiting times by approximately 14 days (a 25% increase with respect to the mean of the dependent variable) when we restrict the analysis to local authorities with an IMD above the median. The effect becomes even larger (20 days, + 38% of the mean of the dependent variable) when limit the sample to the 4 highest deciles of the

[8]We replicated Table 14 for waiting times in elective care and A&E, but found no evidence of significant effects even when restricting the analysis to deprived areas outside London.

[9]Note that in Table 13 we include region fixed effects, rather than PCT fixed-effects, as the smaller sample size of each quintile does not allow us to have sufficient identification power if using PCT fixed-effects.

IMD. Using the estimates of Propper (1995) on the cost of waiting time, an average increase of 20 days in waiting time would be equivalent to a GBP 100 (in 2013 prices) increase in cost per patient.

As shown in Figure 4 and Table 12 deprived areas attract immigrants with worse health status. One of the factors contributing to the higher morbidity of immigrants moving into more deprived areas may be the higher presence of non-economic immigrants. Previous studies have shown that refugees and asylum seekers have worse health than economic migrants (Chiswick et al. (2008)). In the UK most asylum seekers are assigned to local areas by the UK Government based on space and logistical considerations. However, as noted by Bell et al. (2013) asylum seekers are disproportionately sent to deprived areas. Using data from the Home Office Immigration Statistics confirm this result in Figure 5.

In Table A.2, we show that a larger number of asylum seekers in a local authority is associated with higher waiting times. Columns 1 and 2 report OLS estimates including PCT and year fixed effects (column 2). Column 3 and 4 repeat this analysis for asylum seekers in dispersal accommodation. The coefficient is positive, but becomes non-significant when including year fixed effects. The sign of this relationship between the share of asylum seekers and the average waiting time for outpatients is confirmed when using asylum seekers in dispersal accommodation to instrument for the total number of asylum seekers in an area (column 5) as in (Bell et al., 2013). Again, the coefficient is not precisely estimated once we include year fixed effects (column 6) and the estimated effect is relatively small: a one standard deviation in the share of asylum seekers is associated with approximately a 1% increase in waiting time with respect to the mean of the dependent variable. Yet, these results suggest that the larger presence of asylum seekers in deprived areas may contribute to the increase in waiting times found in Table 14.

7 Robustness Checks

7.1 Using data from National Insurance Numbers (NINo) as an Alternative Measure of Immigration

Using the LFS to compute the stock of immigrants living in a local authority is subject to measurement error as in some local authorities as the share of immigrants in the LFS sample is

low. Measurement error can result in substantial attenuation bias. While, as underlined by Sá (2015), using an instrumental variable based on Census data and national-level inflows substantially mitigates this concern, we further check the robustness of our results using data from the NINOs registrations to overseas nationals from the Department for Work and Pensions.

Overseas nationals looking to work, claim benefits or tax credits in the UK needs a NINo. Thus, NINo registrations of foreign nationals provide us with an alternative source of information on immigrant inflows across local authorities. The main advantage of using NINo data is that they are based on administrative records and provide a good measure of employment-driven migration (Lucchino et al., 2012). However, NINOs only provide information for the point and time of registration. Immigrants may change residence over time or leave the UK and return without having to re-register for a new NINo. We compute the stock of immigrants living in different local authorities using the 2001 Census data as a base for the initial stock of immigrants by local authority and the NINo data (available since 2002) to compute the evolution of the stock of immigrants by local authorities in the period under study (2003-2012). In Table 15, we replicate the main results presented in Tables 2-4 and find very similar results, confirming the negative effect on waiting times for outpatients and the non-significant effects on waiting times for elective care and A&E.

7.2 Regional Analysis

In this section we test the robustness of our results to a change of the geographical unit using a higher level of aggregation. Consistent with previous analysis by Borjas (2006) and Sá (2015) we find no evidence that immigration has a negative effect on waiting times when waiting times are aggregated at the regional level (see Table 16). While point estimates are not precise and the standard errors very large as the sample is much smaller, the point-estimate is much smaller than the one presented in Table 2.

A likely explanation of this result is that intra-region native mobility is diffusing the effects of immigration within a region (see Tables 5). Immigration may decrease waiting times at the local level, but the outflow of natives in response to immigration may increase waiting times in other local areas (see Table 6).

8 Conclusion

Immigrant free access to the NHS and the perceived associated health care costs have generated much debate in the UK and even resulted in the introduction of a fee for non-EU citizens to access NHS services. While previous papers analysed the effect of immigration to the UK on welfare use, and documented differences between foreign born and natives in health care use, we know less about the effects of immigration on NHS waiting times, which is one of the most pressing issues of the NHS system.

This article contributes to the previous literature by estimating the effects of immigration on NHS waiting times in England. We find that immigration reduced waiting times for outpatient referrals. A 10 percentage points increase in the share of migrants living in a local authority would reduce waiting times by 9 days on average. We find no evidence that immigration affects waiting times in A&E and in elective care. This result is likely to be driven by two key factors. First, migrants tend to be young and healthy upon arrival (healthy immigrant effect) and likely to have a smaller impact on the demand for NHS services. Second, the arrival of immigrants increases the likelihood of natives moving and accessing health services in a different local authority. Thus, the effects of immigration on the demand for health care services are dispersed throughout the country (via internal migration).

We also observe a positive impact of immigration on outpatient waiting times in the years immediately following the 2004 EU enlargement in the more deprived areas outside London. Part of this effect is explained by the fact that less healthy immigrants tend to move into more deprived areas increasing the demand for NHS services in those areas. Another driving factor is the lower mobility of natives in deprived areas, particularly among those with health problems.

References

Altonji, J. G., Card, D., 1991. The effects of immigration on the labor market outcomes of less-skilled natives. In: Immigration, trade and the labor market. University of Chicago Press, pp. 201–234.

Appleby, J., 2012. Public satisfaction with the NHS and its services. Headlines from the British

Social Attitudes Survey. London: The King's Fund.

Appleby, J., Thompson, J., Jabbal, J., 2014. How is the NHS performing? The King's Fund Quarterly Monitoring Report.

Bell, B., Fasani, F., Machin, S., 2013. Crime and immigration: Evidence from large immigrant waves. Review of Economics and Statistics 21 (3), 1278–1290.

Blinder, S., 2012. UK public opinion toward immigration: Overall attitudes and level of concern. Centre on Migration, Policy and Society Briefing Paper. Available at http://www. migrationobservatory. ox. ac. uk/sites/files/migobs/Public% 20Opinion-Overall% 20Attitudes% 20and% 20Level% 20of% 20Concern. pdf.

Borjas, G. J., 2003. The labor demand curve is downward sloping: Reexamining the impact of immigration on the labor market. The Quarterly Journal of Economics 118 (4), 1335–1374.

Borjas, G. J., 2006. Native internal migration and the labor market impact of immigration. Journal of Human Resources 41 (2), 221–258.

Borjas, G. J., Freeman, R. B., Katz, L. F., 1996. Searching for the effect of immigration on the labor market. The American Economic Review, 246–251.

Card, D., 2001. Immigrant inflows, native outflows, and the local labor market impacts of higher immigration. Journal of Labor Economics 19 (1), 22–64.

Castelli, A., Dawson, D., Gravelle, H., Jacobs, R., Kind, P., Loveridge, P., Martin, S., O'Mahony, M., Stevens, P. A., Stokes, L., et al., 2007. A new approach to measuring health system output and productivity. National Institute Economic Review 200 (1), 105–117.

Chiswick, B. R., Lee, Y. L., Miller, P. W., October 2008. Immigrant selection system and immigrant health. Contemporary Economic Policy 26 (4), 1074–3529.

Cooper, Z. N., McGuire, A., Jones, S., Le Grand, J., 2009. Equity, waiting times, and NHS reforms: retrospective study. BMJ 339.

Cullis, J. G., Jones, P. R., Propper, C., 2000. Waiting lists and medical treatment: analysis and policies. Handbook of Health Economics 1, 1201–1249.

Dustmann, C., Frattini, T., 2014. The fiscal effects of immigration to the UK. The Economic Journal 124 (580), F593–F643.
URL http://dx.doi.org/10.1111/ecoj.12181

Dustmann, C., Frattini, T., Halls, C., 2010. Assessing the fiscal costs and benefits of A8 migration to the UK. Fiscal Studies 31 (1), 1–41.

Dustmann, C., Frattini, T., Preston, I. P., 2013. The effect of immigration along the distribution of wages. The Review of Economic Studies 80 (1), 145–173.

Gaynor, M., Laudicella, M., Propper, C., 2012. Can governments do it better? Merger mania and hospital outcomes in the English NHS. Journal of Health Economics 31 (3), 528–543.

Giuntella, O., 2013. Why does the health of immigrants deteriorate? Evidence from birth records. IZA Discussion Paper 7588.

Gravelle, H., Smith, P., Xavier, A., 2003. Waiting lists and waiting times: a model of the market for elective surgery. Oxford Economic Papers, 81–103.

Hatton, T. J., Tani, M., 2005. Immigration and inter-regional mobility in the UK, 1982–2000*. The Economic Journal 115 (507), F342–F358.

Jasso, G., Massey, D. S., Rosenzweig, M. R., Smith, J. P., 2004. Immigrant health: Selectivity and acculturation. The Institute for Fiscal Studies Working Paper 4 (23), 1–46.

Kennedy, S., Kidd, M. P., McDonald, J. T., Biddle, N., 2014. The healthy immigrant effect: Patterns and evidence from four countries. Journal of International Migration and Integration 16 (2), 317–332.

Laudicella, M., Siciliani, L., Cookson, R., 2012. Waiting times and socioeconomic status: evidence from England. Social Science & Medicine 74 (9), 1331–1341.

Lindsay, C. M., Feigenbaum, B., 1984. Rationing by waiting lists. The American Economic Review, 404–417.

Lucchino, P., Rosazza-Bondibene, C., Portes, J., 2012. Examining the relationship between immigration and unemployment using National Insurance Number Registration Data. NIESR Discussion Paper No. 386.

Martin, S., Rice, N., Jacobs, R., Smith, P., 2007. The market for elective surgery: Joint estimation of supply and demand. Journal of Health Economics 26 (2), 263–285.

Norman, P., Boyle, P., Rees, P., 2005. Selective migration, health and deprivation: a longitudinal analysis. Social Science & Medicine 60 (12), 2755–2771.

Palloni, A., Morenoff, J. D., 2001. Interpreting the paradoxical in the Hispanic paradox. Annals of the New York Academy of Sciences 954 (1), 140–174.

Propper, C., 1995. The disutility of time spent on the United Kingdom's National Health Service waiting lists. Journal of Human Resources, 677–700.

Propper, C., Burgess, S., Gossage, D., 2008. Competition and quality: Evidence from the NHS internal market 1991–9*. The Economic Journal 118 (525), 138–170.

Propper, C., Damiani, M., Leckie, G., Dixon, J., 2007. Impact of patients' socioeconomic status on the distance travelled for hospital admission in the English National Health Service. Journal of Health Services Research & Policy 12 (3), 153–159.

Rienzo, C., Vargas-Silva, C., 2012. Migrants in the UK: An overview. Migration Observatory Briefing, COMPAS, University of Oxford, Oxford.

Sá, F., 2015. Immigration and house prices in the UK. The Economic Journal 125 (587), 1393–1424.

Siciliani, L., Iversen, T., 2012. Waiting times and waiting lists. The Elgar Companion to Health Economics, 259.

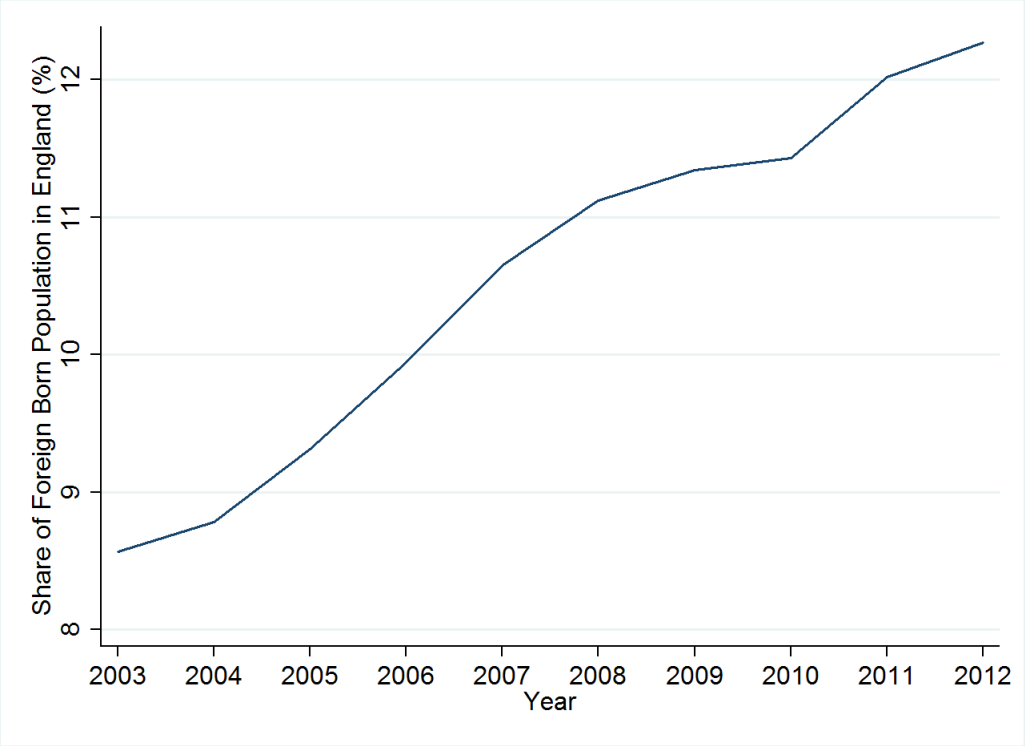
Sitzia, J., Wood, N., 1997. Patient satisfaction: a review of issues and concepts. Social Science & Medicine 45 (12), 1829–1843.

Steventon, A., Bardsley, M., 2011. Use of secondary care in england by international immigrants. Journal of Health Services Research & Policy 16 (2), 90–94.

Wadsworth, J., 2013. Mustn't grumble: Immigration, health and health service use in the UK and Germany. Fiscal Studies 34 (1), 55–82.

Windmeijer, F., Gravelle, H., Hoonhout, P., 2005. Waiting lists, waiting times and admissions: an empirical analysis at hospital and general practice level. Health economics 14 (9), 971–985.

Figure 1: Foreign-born share of the population in England (LFS, 2003-2012)

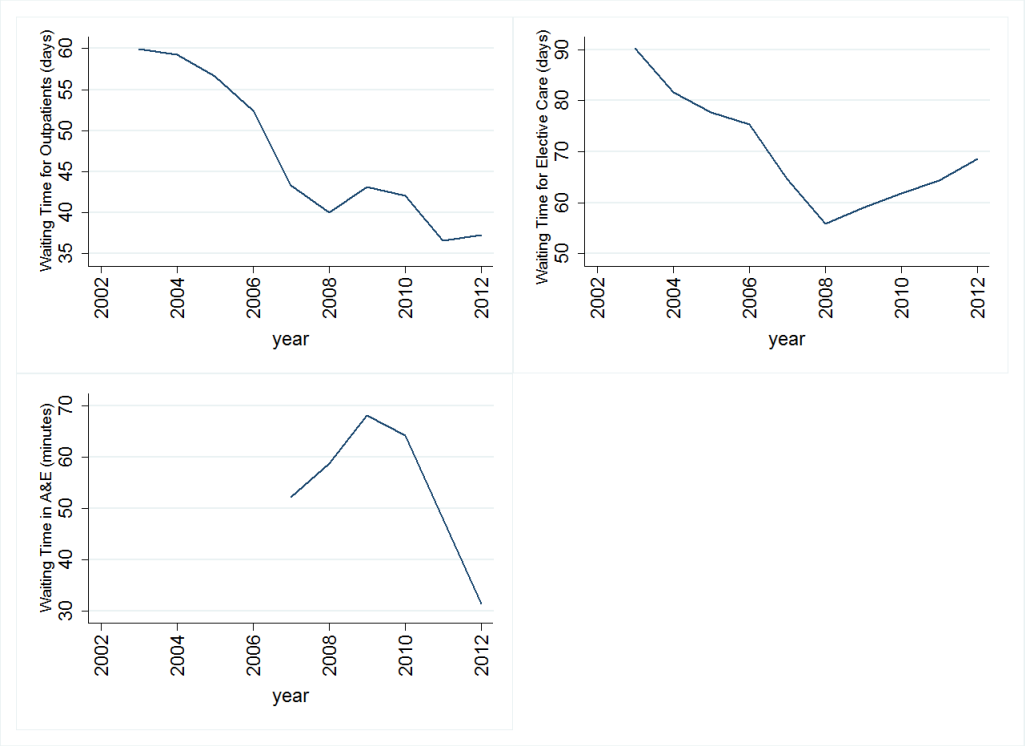


Notes - Data are drawn from the UK Labor Force Survey (2003-2012).

Figure 2: New migrant GP registrations as a share of total population in England (2003-2012)

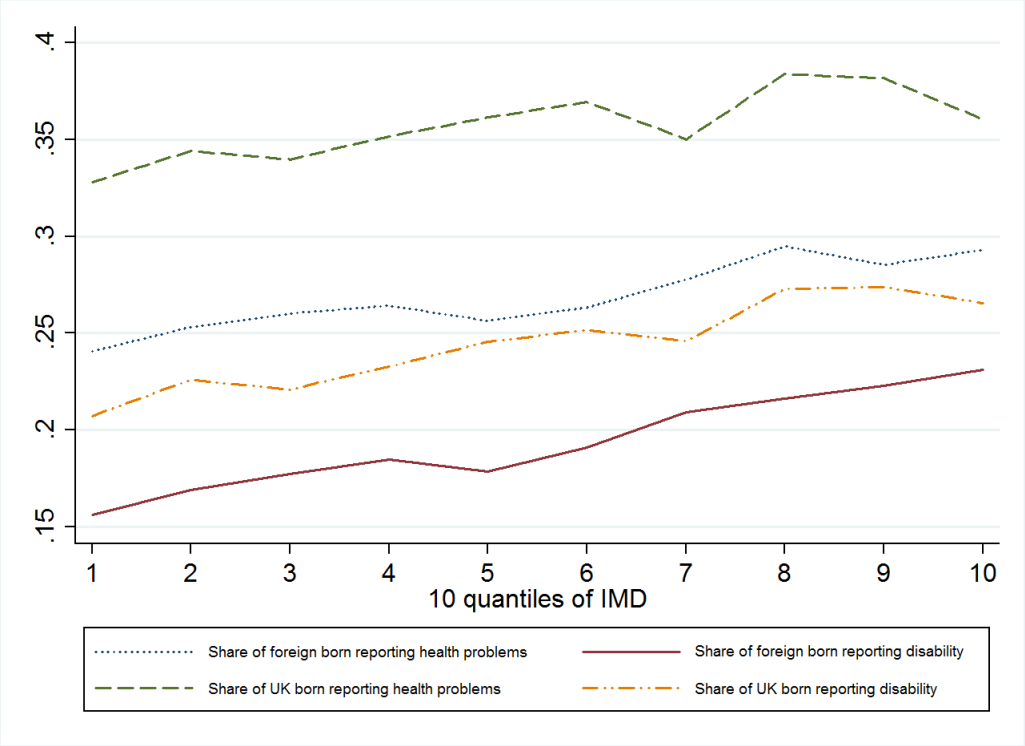
Notes - Source: Patient Register Data Service (2004-2012).

Figure 3: Waiting Times in the NHS (2003-2012)



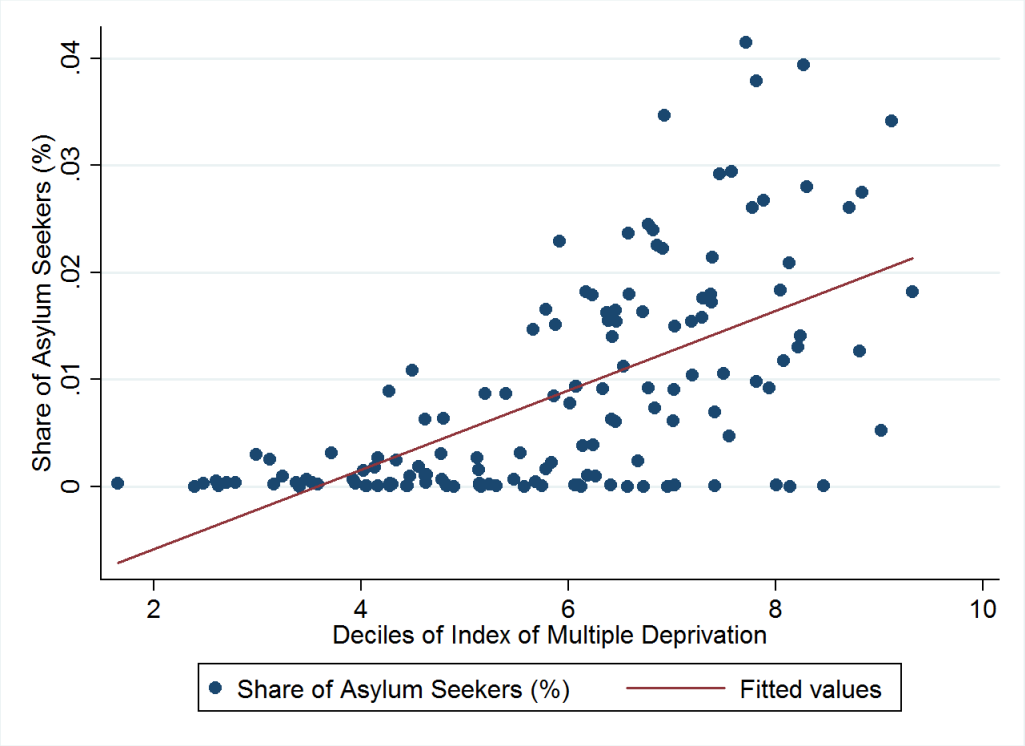
Notes - Data on average waiting times for outpatient services are drawn from the Hospital Episodes Statistics.

Figure 4: Health by migrant status and Index of Multiple Deprivation (IMD) in England (2003-2012)



Notes - Data are drawn from the UK Labor Force Survey.

Figure 5: Share of asylum seekers in the population by Index of Multiple Deprivation (IMD) in England (2003-2012)



Notes - Data are drawn from the UK Home Office (2003-2012).

Table 1: Summary Statistics, 2003-2012

		Mean	Std
Waiting times (LSOA-level, Source: NHS, HES)			
Waiting time for Outpatients (Days)		47.06	(16.61)
Waiting time for Elective (Days)		69.82	(39.51)
Waiting time for A&E (minutes)		51.98	(64.56)
LSOA characteristics			
Log total population		7.35	(0.15)
Share of Women over 60		0.12	(0.05)
Share of Men over 65		0.07	(0.03)
Share of Women		0.51	(0.03)
Rural Index (1-8)		5.30	(0.86)
IMD score		21.54	(15.61)
Supply Characteristics (PCT-level, Source: NHS, ONS)			
GPs per 1k pop		0.94	(0.17)
Specialists per 1k pop		0.16	(0.03)
Ratio of occupied hospital beds to population		0.82	(0.19)
NHS expenditure per capita , (000s)		1.11	(0.59)
Incidence of Disease ((PCT-level, per 1000, , Source: HES, ONS)			
Stroke		16.61	(3.88)
Coronary disease		37.28	(8.57)
Hypertension		138.25	(18.60)
Diabetes		39.14	(7.11)
Pulmonary Disease		15.19	(4.80)
Epilepsy		6.32	(1.04)
Hypothyroidism		26.60	(6.20)
Cancer		9.43	(4.17)
Mental Health		7.00	(2.13)
Ventricular Disfunction		5.30	(0.86)
Immigration(LA-level, Source: LFS)			
Share of Immigrants (LFS)		11.75	(10.99)
Observation	287,092	287,092	

Notes - Data are drawn from the Hospital Episodes Statistics, the UK Labor Force Survey, and the UK ONS.

Table 2: Immigration and Waiting Times (days) in the NHS (Outpatients), 2003-2012

	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) 2SLS	(6) 2SLS
Share of Immigrants	-0.324*	-0.163	-0.164	-1.575**	-0.933**	-0.935**
	(0.178)	(0.158)	(0.158)	(0.701)	(0.461)	(0.461)
Year f.e.	YES	YES	YES	YES	YES	YES
PCT f.e.	YES	YES	YES	YES	YES	YES
LSOA time-varying characteristics	NO	YES	YES	NO	YES	YES
LSOA population	NO	NO	YES	NO	NO	YES
Observations	287,092	287,092	287,092	287,092	287,092	287,092
Mean of Dep. Var.	47.07	47.12	47.12	47.07	47.12	47.12
Std.Err. of Dep. Var.	16.61	16.65	16.65	16.61	16.65	16.65
IV F-stat				17.11	16.07	16.05

Notes - The dependent variable is the average waiting time for outpatient services (in days). Data on average waiting times for outpatient services are drawn from the Hospital Episodes Statistics. Data on immigrant distribution across Local Authorities are drawn from the UK Labor Force Survey. Time-varying LSOA characteristics include an Index of Deprivation (we use dummies for each decile of the index) and an indicator for rural status, the share of women, and the share of over 65 in the LSOA population. PCT time-varying characteristics include ratio of occupied hospital beds to population, number of GPs per capita, number of GP practice per capita, number of health consultants per capita, health expenditure per capita, incidence of most common diseases. Columns 3 and 6 include LSOA size. Standard errors are clustered at the Local Authority level.

Table 3: Immigration and Waiting Times (days) in the NHS (Elective Care - Inpatients), 2003-2012

	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) 2SLS	(6) 2SLS
Share of Immigrants	-0.103	-0.477*	-0.475*	0.204	0.203	0.208
	(0.317)	(0.261)	(0.262)	(0.597)	(0.596)	(0.597)
Year f.e.	YES	YES	YES	YES	YES	YES
PCT f.e.	YES	YES	YES	YES	YES	YES
LSOA time-varying characteristics	NO	YES	YES	NO	YES	YES
LSOA population	NO	NO	YES	NO	NO	YES
Observations	287,092	287,092	287,092	287,092	287,092	287,092
Mean of Dep. Var.	69.83	69.88	69.88	69.83	69.88	69.88
Std.Err. of Dep. Var.	39.52	39.36	39.36	39.52	39.36	39.36

Notes - The dependent variable is the average waiting time for inpatients (in days). Data on average waiting times for elective care are drawn from the Hospital Episodes Statistics. Data on immigrant distribution across Local Authorities are drawn from the UK Labor Force Survey. Time-varying LSOA characteristics include an Index of Deprivation (we use dummies for each decile of the index) and an indicator for rural status, the share of women, and the share of over 65 in the LSOA population. PCT time-varying characteristics include ratio of occupied hospital beds to population, number of GPs per capita, number of GP practice per capita, number of health consultants per capita, health expenditure per capita, incidence of most common diseases Columns 3 and 6 include LSOA size. Standard errors are clustered at the Local Authority level.

Table 4: Immigration and Waiting Times (minutes) in the NHS (A&E), 2007-2012

	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) 2SLS	(6) 2SLS
Share of Immigrants	-0.780	-0.522	-0.522	1.772	1.203	1.203
	(1.151)	(0.978)	(0.978)	(1.295)	(1.147)	(1.147)
Year f.e.	YES	YES	YES	YES	YES	YES
PCT f.e.	YES	YES	YES	YES	YES	YES
LSOA time-varying characteristics	NO	YES	YES	NO	YES	YES
LSOA population	NO	NO	YES	NO	NO	YES
Observations	145,028	145,028	145,028	145,028	145,028	145,028
Mean of Dep. Var.	55.26	55.30	55.30	55.26	55.30	55.30
Std.Err. of Dep. Var.	65.56	65.53	65.53	65.56	65.53	65.53

Notes - The dependent variable is the average waiting time in A&E (in minutes). Data on average waiting times for A&E are drawn from the Hospital Episodes Statistics. Data on immigrant distribution across Local Authorities are drawn from the UK Labor Force Survey. Time-varying LSOA characteristics include an Index of Deprivation (we use dummies for each decile of the index) and an indicator for rural status, the share of women, and the share of over 65 in the LSOA population. PCT time-varying characteristics include ratio of occupied hospital beds to population, number of GPs per capita, number of GP practice per capita, number of health consultants per capita, health expenditure per capita, incidence of most common diseases Columns 3 and 6 include LSOA size. Standard errors are clustered at the Local Authority level.

Table 5: Immigrant Inflows and Native Internal Mobility (LFS, 2004-2012)

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS	(5) OLS	(6) 2SLS
Dependent Variable:	Out-migration rate	Out-migration rate	In-migration rate	In-migration rate	Net out-migration rate	Net out-migration rate
$\Delta FBit/Pop_{it-1}$	0.119***	0.159***	0.053***	0.062***	0.066***	0.097***
	(0.014)	(0.027)	(0.016)	(0.019)	(0.022)	(0.033)
Observations	1,269	1,269	1,269	1,269	1,269	1,269
Mean of Dep. Var.	0.033	0.033	0.030	0.030	0.003	0.003
Std.Err. of Dep. Var.	0.056	0.056	0.042	0.042	0.048	0.048
IV-Fstat	25.36	25.36	25.36			

Notes - Data are drawn from the UK Labor Force Survey. Information on past year residence is available only since 2004. All the regressions include year and local authority fixed effects and the standard errors are clustered at the Local Authority level.

Table 6: Native Internal Mobility and Waiting Times for Outpatients (days), 2004-2012

	(1)	(2)	(3)
	2SLS	2SLS	2SLS
Dependent Variable:	Waiting Time	Waiting Time	Waiting Time
Natives	5.689***	3.219***	3.227***
	(1.716)	(1.138)	(1.138)
Year f.e.	YES	YES	YES
PCT f.e.	YES	YES	YES
LSOA time-varying characteristics	NO	YES	YES
LSOA population	NO	NO	YES
First-Stage F	11.14	7.00	7.01
Observations	258,458	258,458	258,458
Mean of Dep. Var.	45.71	45.71	45.71
Std.Err. of Dep. Var.	15.64	15.64	15.64
IV-Fstat	12.52	11.91	11.91

Notes - The dependent variable is the average waiting time for outpatient services (in days. Data on average waiting times for outpatient services are drawn from the Hospital Episodes Statistics. Data on immigrant distribution across Local Authorities are drawn from the UK Labor Force Survey. Information on past year residence is available only since 2004. Time-varying LSOA characteristics include an Index of Deprivation (we use dummies for each decile of the index) and an indicator for rural status, the share of women, and the share of over 65 in the LSOA population. PCT time-varying characteristics include ratio of occupied hospital beds to population, number of GPs per capita, number of GP practice per capita, number of health consultants per capita, health expenditure per capita, incidence of most common diseases. Columns 3 includes LSOA size. Standard errors are clustered at the Local Authority level.

Table 7: Immigrant-Native Differences in Health, (LFS, 2004-2012)

Panel A: Any health issue			
Foreign born	-0.075***	-0.046***	-0.049***
	(0.001)	(0.001)	(0.001)
Observations	1,596,154	1,551,640	1,551,640
Mean of Dep.Var.	0.317	0.319	0.319
Std.Err.	(0.465)	(0.466)	(0.466)
Panel B: Any disability			
Foreign born	-0.039***	-0.024***	-0.029***
	(0.001)	(0.001)	(0.001)
Observations	1,583,195	1,538,633	1,538,633
Mean of Dep.Var.	0.220	0.222	0.223
Std.Err.	(0.414)	(0.416)	(0.416)
Panel C: Absent at work due to illness or injury			
Foreign born	-0.003***	-0.002***	-0.004***
	(0.001)	(0.001)	(0.000)
Observations	983,229	938,668	938,668
Mean of Dep.Var.	0.023	0.023	0.023
Std.Err.	(0.152)	(0.151)	(0.151)
Socio-demographic characteristics	NO	YES	YES
Year f.e.	NO	YES	YES
Local authority f.e.	NO	NO	YES

Notes - Sociodemographic characteristics include gender, dummies for age, education, occupation (1-digit). Robust standard errors are reported in parentheses.

Table 8: Immigrant-Native Internal Migrants Differences in Health, (LFS, 2004-2012)

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Any health issue						
Foreign born	-0.038***	-0.051***				
	(0.005)	(0.004)				
Foreign born			-0.106***	-0.072***		
arrived after 2000			(0.005)	(0.003)		
Foreign born					-0.131***	-0.084***
arrived after 2004					(0.005)	(0.003)
Observations	166,078	162,869	96,854	95,655	62,649	62,401
Mean of Dep. Var.	0.185	0.186	0.121	0.122	0.105	0.105
Std.Err. of Dep. Var.	0.388	0.389	0.327	0.327	0.307	0.307
Panel B: Any disability						
Foreign born	-0.026***	-0.039***				
	(0.004)	(0.003)				
Foreign born			-0.080***	-0.057***		
arrived after 2000			(0.004)	(0.003)		
Foreign born					-0.101***	-0.069***
arrived after 2004					(0.004)	(0.003)
Observations	165,192	161,979	95,816	94,615	61,634	61,385
Mean of Dep. Var.	0.138	0.139	0.0850	0.0854	0.0711	0.0711
Std.Err. of Dep. Var.	0.344	0.346	0.279	0.279	0.257	0.257
Panel C: Absent at work due to illness or injury						
Foreign born	-0.001	-0.004*				
	(0.002)	(0.002)				
Foreign born			-0.004	-0.006***		
arrived after 2000			(0.002)	(0.002)		
Foreign born					-0.006**	-0.006***
arrived after 2004					(0.002)	(0.002)
Observations	109,582	106,369	63,004	61,803	39,494	39,245
Mean of Dep. Var.	0.0216	0.0214	0.0200	0.0200	0.0186	0.0185
Std.Err. of Dep. Var.	0.145	0.145	0.140	0.140	0.135	0.135
Sociodemographic characteristics	NO	YES	NO	YES	NO	YES
Year f.e.	NO	YES	NO	YES	NO	YES
Local authority f.e.	NO	YES	NO	YES	NO	YES

Notes - We restrict the sample of natives to individuals who were living in a different local authority in the previous year. Standard errors (in prentheses) are clustered at the local authority level. Regressions include year and local authority fixed effects. Sociodemographic characteristics include gender, dummies for age, education occupation (1-digit).

Table 9: Immigrant Health Advantage, (Understanding Society, 2009-2014)

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Poor health, waves 1-4						
Foreign born	-0.047***	-0.047***				
	(0.007)	(0.007)				
Foreign born			-0.134***	-0.134***		
came after 2000			(0.007)	(0.007)		
Foreign born					-0.144***	-0.144***
came after 2004					(0.008)	(0.008)
Observations	67,584	67,584	62,711	62,711	61,565	61,565
Sociodemographic Controls	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	0.193	0.193	0.190	0.190	0.192	0.192
Std.Err. of Dep. Var.	0.394	0.394	0.393	0.393	0.394	0.394
Panel B: Disability, waves 1-4						
Foreign born	-0.127***	-0.127***				
	(0.009)	(0.009)				
Foreign born			-0.256***	-0.256***		
came after 2000			(0.010)	(0.010)		
Foreign born					-0.276***	-0.276***
came after 2004					(0.011)	(0.011)
Observations	67,649	67,649	62,770	62,770	61,623	61,623
Sociodemographic Controls	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	0.359	0.359	0.360	0.360	0.365	0.365
Std.Err. of Dep. Var.	0.480	0.480	0.480	0.480	0.481	0.481
Panel C: Any health limitation, waves 1-4						
Foreign born	-0.018***	-0.018***				
	(0.005)	(0.005)				
Foreign born			-0.066***	-0.066***		
came after 2000			(0.005)	(0.005)		
Foreign born					-0.074***	-0.074***
came after 2004					(0.006)	(0.006)
Observations	67,672	67,672	62,791	62,791	61,643	61,643
Sociodemographic characteristics	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	0.114	0.114	0.112	0.112	0.113	0.113
Std.Err. of Dep. Var.	0.318	0.318	0.316	0.316	0.317	0.317

Notes - Data are drawn from waves 1-4 of the Understanding Society. Sociodemographic characteristics include controls for gender, dummies for age, education occupation (1-digit), employment status, income, region, an index of rural status, and year fixed effects. Robust standard errors are reported in parentheses.

Table 10: Immigrant-Native Differences in Health Care Use, (Understanding Society, 2009-2014)

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Inpatient days, waves 1-4						
Foreign born	-0.001	-0.001				
	(0.002)	(0.002)				
Foreign born			-0.010***	-0.010***		
came after 2000			(0.003)	(0.003)		
Foreign born					-0.013***	-0.013***
came after 2004					(0.003)	(0.003)
Observations	67,672	67,672	62,791	62,791	61,643	61,643
Sociodemographic Controls	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	0.0196	0.0196	0.0190	0.0190	0.0191	0.0191
Std.Err. of Dep. Var.	0.160	0.160	0.157	0.157	0.158	0.158
Panel B: Hospital services use, wave 4						
Foreign born	-0.002	-0.002				
	(0.015)	(0.015)				
Foreign born			-0.037**	-0.037**		
came after 2000			(0.018)	(0.018)		
Foreign born					-0.051**	-0.051**
came after 2004					(0.020)	(0.020)
Observations	4,551	4,551	3,178	3,178	2,816	2,816
Sociodemographic Controls	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	0.483	0.483	0.459	0.459	0.457	0.457
Std.Err. of Dep. Var.	0.500	0.500	0.498	0.498	0.498	0.498
Panel C: Doctor services use, wave 4						
Foreign born	0.020*	0.020*				
	(0.011)	(0.011)				
Foreign born			-0.020	-0.020		
came after 2000			(0.014)	(0.014)		
Foreign born					-0.026	-0.026
came after 2004					(0.016)	(0.016)
Observations	4,551	4,551	3,178	3,178	2,816	2,816
Sociodemographic characteristics	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	0.846	0.846	0.821	0.821	0.821	0.821
Std.Err. of Dep. Var.	0.361	0.361	0.383	0.383	0.384	0.384

Notes - Data for Panel A are drawn from waves 1-4 of the Understanding Society. Data for Panel B and c are drawn from wave 4 of the Understanding Society. Sociodemographic characteristics include controls for gender, dummies for age, education occupation (1-digit), employment status, income, region, an index of rural status and year fixed effects. Robust standard errors are reported in parentheses.

Table 11: Immigration and NHS Supply, 2003-2012

Dependent Variable:	(1) 2SLS Overall expenditure	(2) 2SLS Expenditure per capita	(3) 2SLS Ratio of occupied beds	(4) 2SLS # Practice	(5) 2SLS # Practice per capita	(6) 2SLS # GP	(7) 2SLS #GP per capita	(8) 2SLS #consultant	(9) 2SLS # consultant per capita	(10) 2SLS # GP graduated abroad
Share of Immigrants	-0.004	-0.006	0.000	0.368	-0.000	1.818	-0.003	0.711	0.007	-0.054
	(0.011)	(0.007)	(0.003)	(0.321)	(0.000)	(2.426)	(0.003)	(3.816)	(0.012)	(0.257)
Observations	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290
Mean of Dep. Var.	12.68	1.226	0.814	57.52	0.170	340.1	0.953	253.4	0.827	48.20
Std.Err. of Dep. Var.	0.646	0.546	0.218	25.71	0.0408	206.0	0.217	206.1	0.706	25.98
IV-Fstat	11.83	11.83	11.83	11.83	11.83	11.83	11.83	11.83	11.83	17.82

Notes - Data on per capita expenditure, share of occupied beds, practices, consultants and GPs are drawn from the Hospital Episodes Statistics and are at the PCT level. Data on immigrant distribution across Local Authorities are drawn from the UK Labor Force Survey. All estimate include PCT and year fixed effects. Standard errors are clustered at the Local Authority level.

Table 12: Health Across Less and More Deprived Areas in England, (LFS, 2003-2012)

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Any health issue	Any health issue	Any health issue	Any health issue	Any health issue	Any health issue
	All	All	UK-born	UK-born	Foreign-born	Foreign-born
Highly deprived areas	0.016***	0.010***	0.021***	0.011***	0.023***	0.015**
	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.006)
Sociodemographic characteristics	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES
Local authority F.E.	YES	YES	YES	YES	YES	YES
Mean of Dep.Var.	0.302	0.319	0.326	0.329	0.242	0.244
Std.Err.	(0.459)	(0.466)	(0.469)	(0.470)	(0.429)	(0.429)
Observations	1,596,291	1,551,777	1,392,313	1,351,754	203,841	199,886

Notes - All estimates include year and local authority fixed effects. Sociodemographic characteristics include gender, age (dummies), education (dummies), occupation (1-digit, dummies). Standard errors in parentheses are clustered at the local authority level. Robust standard errors are reported in parentheses.

Table 13: Immigration and Waititing Times (in days) for Outpatients by Index of Multiple Deprivation (IMD) quintiles, 2003-2012

	(1) 2SLS Q1	(2) 2SLS Q2	(3) 2SLS Q3	(4) 2SLS Q4	(5) 2SLS Q5
Share of Immigrants	-0.893	-0.730***	-0.669***	-0.549***	-0.277
	(0.543)	(0.234)	(0.213)	(0.201)	(0.193)
Region f.e	YES	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES	YES
Observations	57,491	57,513	57,632	57,352	57,104
R-squared	0.319	0.344	0.374	0.428	0.475
Mean of Dep. Var.	45.69	46.24	47.29	48.19	48.22
Std.Err. of Dep. Var.	15.17	16.40	16.75	17.33	17.34
IV-Fstat	9.44	14.29	13.39	33.07	72.14

Notes - Data on average waiting times for outpatient services are drawn from the Hospital Episodes Statistics. Data on immigrant distribution across Local Authorities are drawn from the UK Labor Force Survey. Time-varying LSOA characteristics include an Index of Deprivation (we use dummies for each decile of the index) and an indicator for rural status, the share of women, and the share of over 65 in the LSOA population. PCT time-varying characteristics include hospital beds' availability, number of GPs per capita, number of GP practice per capita, number of health consultants per capita, health expenditure per capita, incidence of most common diseases. Columns 3 and 6 include LSOA size. Standard errors are clustered at the Local Authority level.

Table 14: Immigration and Waiting Times (days) for Outpatients, by Index of Multiple Deprivation (IMD)

	(1) 2SLS Overall 2003-2012	(2) 2SLS Overall 2003-2007	(3) 2SLS Outside London 2003-2007	(4) 2SLS Outside London 2003-2007 More Deprived Areas (6-10)	(5) 2SLS Outside London 2003-2007 More Deprived Areas(7-10)
Share of Immigrants	-0.934**	-0.818***	0.479	1.499*	2.085*
	(0.461)	(0.317)	(0.350)	(0.788)	(1.143)
Year f.e.	YES	YES	YES	YES	YES
PCT f.e.	YES	YES	YES	YES	YES
LSOA time-varying	YES	YES	YES	YES	YES
characteristics	YES	YES	YES	YES	YES
LSOA	YES	YES	YES	YES	YES
population					
Observations	287,092	144,476	122,067	57,146	44,964
Mean of Dep. Var.	47.12	54.26	51.49	52.03	52.01
Std.Err. of Dep. Var.	16.65	17.27	15.40	16.04	16.27
IV-Fstat	15.99	28.72	54.54	20.60	14.09

Notes - The dependent variable is the average waiting time for outpatient services (in days). Data on average waiting times for outpatient services are drawn from the Hospital Episodes Statistics. Data on immigrant distribution across Local Authorities are drawn from the UK Labor Force Survey. LSOA characteristics include: an Index of Deprivation, ratio of occupied hospital beds to population, density of GP practices, number of specialists and GPs, Rural Index, share of women, share of over 65, LSOA incidence of most common diseases and LSOA size. Standard errors are clustered at the Local Authority level.

Table 15: Immigration and Waiting Times, NINo Data, 2003-2012

	(1) 2SLS	(2) 2SLS	(3) 2SLS
Dependent Variable:	Waiting Time Outpatients	Waiting Time Elective Care	Waiting Time A&*E*
Share of Immigrants	-1.191** (0.560)	0.137 (0.738)	1.172 (1.198)
Observations	287,092	287,092	145,028
LSOA time-varying characteristics	YES	YES	YES
Year f.e.	YES	YES	YES
Region f.e.	NO	NO	NO
PCT f.e.	YES	YES	YES
YearxRegion f.e.	NO	NO	NO
Mean of Dep. Var.	47.12	69.88	55.30
Std.Err. of Dep. Var.	16.65	39.36	65.53

Notes - Data on average waiting times for outpatient services are drawn from the Hospital Episodes Statistics. Data on immigrant distribution across Local Authorities are drawn from the Statistics on Natioanl Insurance Number (UK Department for Work and Pensions). Time-varying LSOA characteristics include an Index of Deprivation (we use dummies for each decile of the index) and an indicator for rural status, the share of women, and the share of over 65 in the LSOA population. PCT time-varying characteristics include ratio of occupied hospital beds to population, number of GPs per capita, number of GP practice per capita, number of health consultants per capita, health expenditure per capita, incidence of most common diseases Columns 3 and 6 include LSOA size. Standard errors are clustered at the Local Authority level.

Table 16: Immigration and Outpatients Waiting Times, Regional Analysis, 2003-2012

	(1) 2SLS	(2) 2SLS
Share of Immigrants	-0.194	-0.316
	(0.188)	(0.251)
Year f.e.	YES	YES
Regional time-varying characteristics	YES	YES
Regional Population	NO	YES
Observations	160	160
Mean of Dep. Var.	45.42	45.42
Std.Err. of Dep. Var.	10.69	10.69
IV-Fstat	396.1	324.6

Notes - The dependent variable is the average waiting time for outpatient services (in days). Data on average waiting times for outpatient services are drawn from the Hospital Episodes Statistics. Data on immigrant distribution across Local Authorities are drawn from the UK Labor Force Survey. Standard errors are clustered at the regional level.

Appendix A

Table A.1: Immigrant-Native Differences in Health Care Use, (General Household Survey, 2000-2006)

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Consulted doctor last 2 wks (exc.hosp)						
Foreign born	0.007*	0.007*				
	(0.004)	(0.004)				
Foreign born			-0.049***	-0.028***		
came after 2000			(0.007)	(0.007)		
Foreign born					-0.069***	-0.048***
came after 2004					(0.012)	(0.012)
Observations	137,273	137,273	128,494	128,494	127,121	127,121
Sociodemographic Controls	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	0.153	0.153	0.152	0.152	0.152	0.152
Std.Err. of Dep. Var.	0.360	0.360	0.359	0.359	0.359	0.359
Panel B: NHS GP consultations last 2 wks						
Foreign born	0.004	0.006				
	(0.005)	(0.005)				
Foreign born			-0.067***	-0.044***		
came after 2000			(0.009)	(0.009)		
Foreign born					-0.086***	-0.065***
came after 2004					(0.013)	(0.014)
Observations	137,273	137,273	128,494	128,494	127,121	127,121
Sociodemographic Controls	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	0.168	0.168	0.167	0.167	0.167	0.167
Std.Err. of Dep. Var.	0.470	0.470	0.468	0.468	0.469	0.469
Panel C: NHS GP consultations last year						
Foreign born	0.103	0.168				
	(0.124)	(0.128)				
Foreign born			-1.744***	-1.140***		
came after 2000			(0.225)	(0.230)		
Foreign born					-2.228***	-1.682***
came after 2004					(0.350)	(0.356)
Observations	137,275	137,275	128,497	128,497	127,122	127,122
Sociodemographic Controls	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	4.366	4.366	4.332	4.332	4.349	4.349
Std.Err. of Dep. Var.	12.22	12.22	12.18	12.18	12.20	12.20
Panel D:Hospital Outpatient Attend - last 3 months						
Foreign born	-0.015***	-0.010***				
	(0.003)	(0.004)				
Foreign born			-0.050***	-0.019***		
came after 2000			(0.007)	(0.007)		
Foreign born					-0.063***	-0.033***
came after 2004					(0.012)	(0.012)
Observations	137,287	137,287	128,506	128,506	127,132	127,132
Sociodemographic characteristics	NO	YES	NO	YES	NO	YES
Mean of Dep. Var.	0.144	0.144	0.145	0.145	0.145	0.145
Std.Err. of Dep. Var.	0.351	0.351	0.352	0.352	0.352	0.352

Notes - Data are drawn from the General Household Survey (GHS, 2000-2006). Sociodemographic characteristics include controls for gender, dummies for age, education, income, region and an index of rural status and an indicator for missing information on income.

Table A.2: Asylum Seekers and Waiting Times for Outpatients, 2003-2012

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) 2SLS	(6) 2SLS
Share of Asylum Seekers in a Local Authority	80.421*** (9.077)	24.499*** (7.397)			68.646*** (12.180)	3.985 (13.322)
Share of Asylum Seekers in Dispersal Accommodation			76.776*** (13.963)	3.733 (12.548)		
PCT f.e.	YES	YES	YES	YES	YES	YES
Year f.e.	NO	YES	NO	YES	NO	YES
Observations	293,382	293,382	293,382	293,382	293,382	293,382
IV F-stat					1529	627.2

Notes - The dependent variable is the average waiting time for outpatient services (in days). Data on average waiting times for outpatient services are drawn from the Hospital Episodes Statistics. Data on asylum seekers are drawn from Home Office, Immigration Statistics (2003-2012). Standard errors (in parentheses) are clustered at the local authority level.

Appendix B

Data Sources:

UK Labour Force Survey (LFS, 2003-2012): the LFS is a quarterly survey of employment and labour markets in the UK. We use the special license version of the survey which includes local authority level information. Source: Office for National Statistics.

National Insurance Number (NINO) registration of overseas nationals (2002-2012): NINOs are used to record contributions and taxes of individuals. The NINO is also necessary for most benefit claims. Source: Department for Work and Pensions.

Asylum seeker statistics (2003-2012): this reports the number of asylum seekers in each local authority receiving Government support (Section 95). It includes asylum seekers in dispersal and non-dispersal accommodation. Source: Home Office.

Hospital Episode Statistics (HES, 2003-2012): it is a records-based system that covers all NHS trusts in England, including acute hospitals, primary care trusts and mental health trusts. Source: Health and Social Care Information Centre.

Understanding Society (US, 2009-2014): it is the largest panel survey in the world, supporting social and economic research. Its sample size is 40,000 households from around the UK. Source: Understanding Society project.

General Household Survey (GHS, 2002-2006): it is a multi-purpose continuous survey carried out by the collecting information on a range of topics from people living in private households in Great Britain. Source: Office for National Statistics.