Social Atlas: a socio-spatial analysis of disparities between ethnicities and healthcare across London

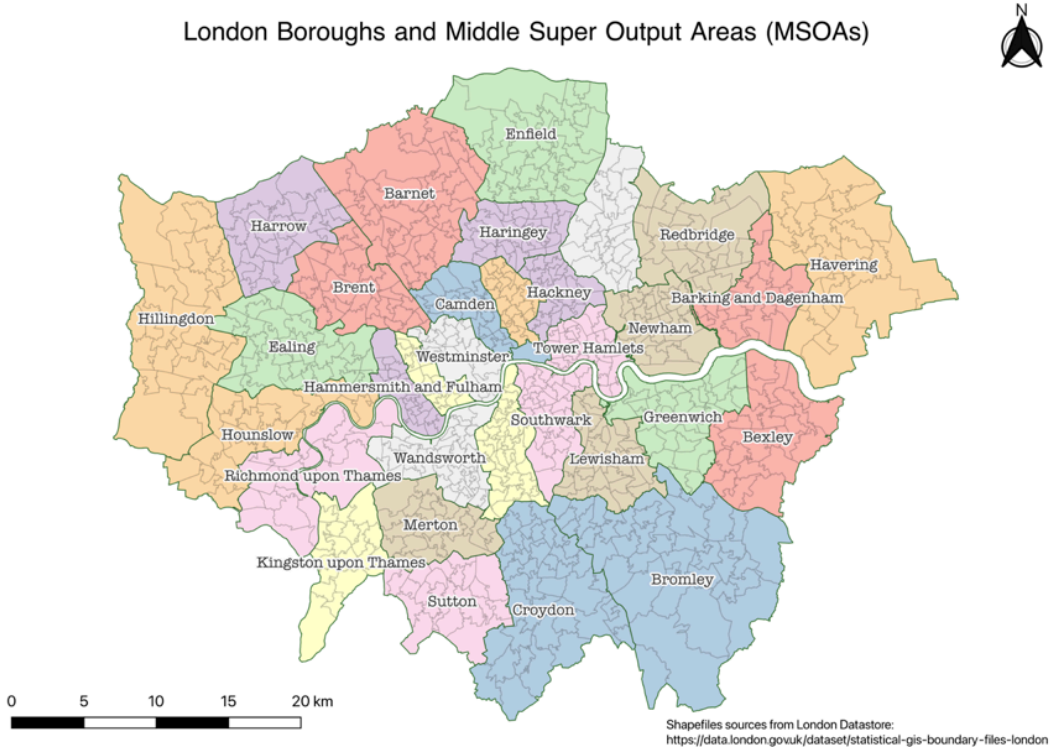
Introduction

London is a multicultural hub with over 200 languages being spoken in (UCL, 2020), and the rise of globalisation and migration has created a place more diverse than it has ever been before. There have been many drivers of migration in recent years, with 'pull' factors such as London's high-value status and its financial district, as well as 'push' factors such as economic downturn in countries (Czaika, 2017).

But how has this change affected pressures on healthcare in London and what factors exacerbate this?

This social atlas will explore the disparities in London, using the region of interest set out in Map 1, between general health and ethnic backgrounds and will determine whether there is a correlation by looking at maps showing distributions of life expectancies, ethnicities, migration levels and general well-being. The data collected was cleaned before manipulation, and specifically used Middle Super Output Areas (MSOAs) and Boroughs across London.

Research question: To what extent is there inequality when comparing ethnic backgrounds to healthcare?

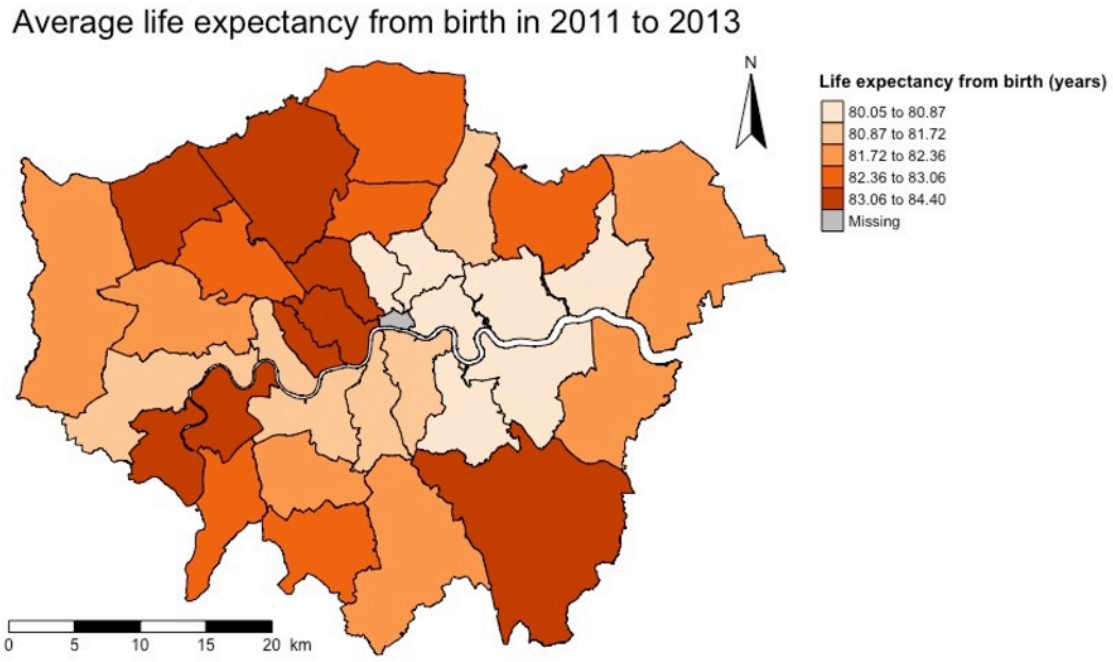


Map : Region of interest for the social atlas.

Life expectancy

Life expectancy values is a key determinant in quality of life and can enable us to view the health gap (Norman *et al.*, 2022). With differences in lifestyles between various ethnicities, certain ethnic groups may be more susceptible to health conditions like diabetes or cardiovascular diseases as well as the recent COVID-19 outbreak (Raleigh and Holmes, 2021).

Map 2 produces a distribution of life expectancies in different London boroughs. Generally, the boroughs with the lowest life expectancy are located on the border of the River Thames' mouth, such as Tower Hamlets, Newham and Greenwich, whilst higher life expectancies are predominantly north of the Thames towards its source, such as Westminster, Barnet and Harrow. The interesting aspect of this map is that boroughs with higher life expectancies are bordered with boroughs of low life expectancies – for example, in south-east London comparing Bromley with Lewisham.

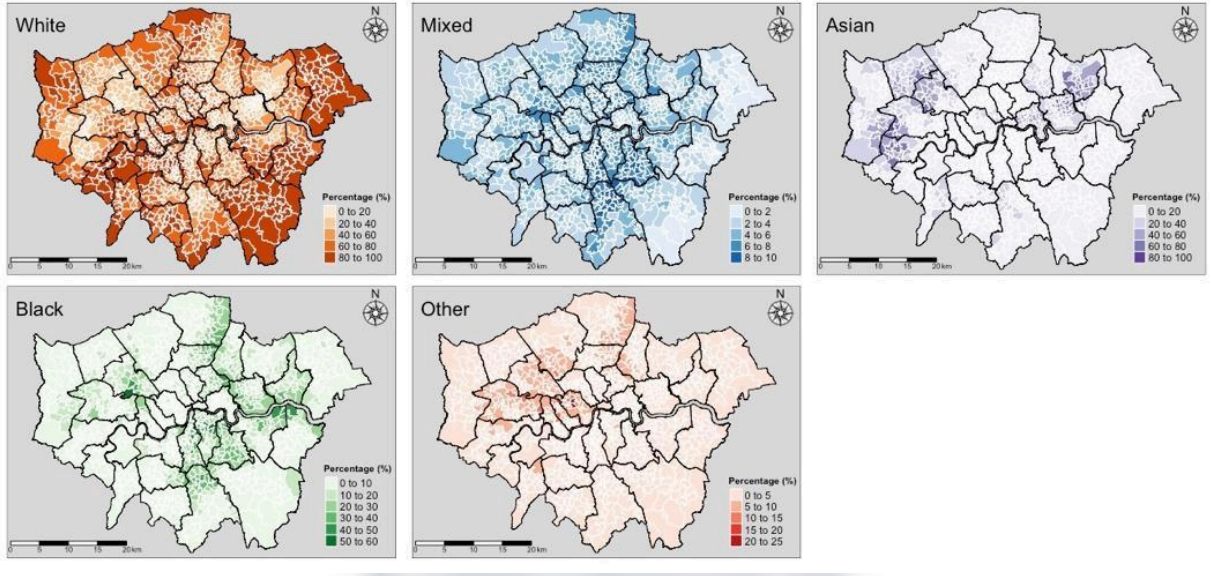


Map : Life expectancy distribution across London boroughs.

Distribution of ethnicities across London

The facet choropleth map shown in Map 3 displays the distribution of the main ethnicities recorded in the UK 2011 Census (InFuse, n/a). By comparing Map 2 and Map 3, we can infer that areas with higher life expectancies in regions such as Bromley can be correlated with a higher distribution of White people, whilst areas with lower life expectancies such as Barking and Dagenham are associated with regions with higher proportions of Asian and Black people.

What is interesting is that the Office for National Statistics (ONS) reported the reverse relationship when expanding the sample to the rest of England and Wales (White, 2021). However, this could be because the life expectancy was averaged in Map 2 between Male and Females.

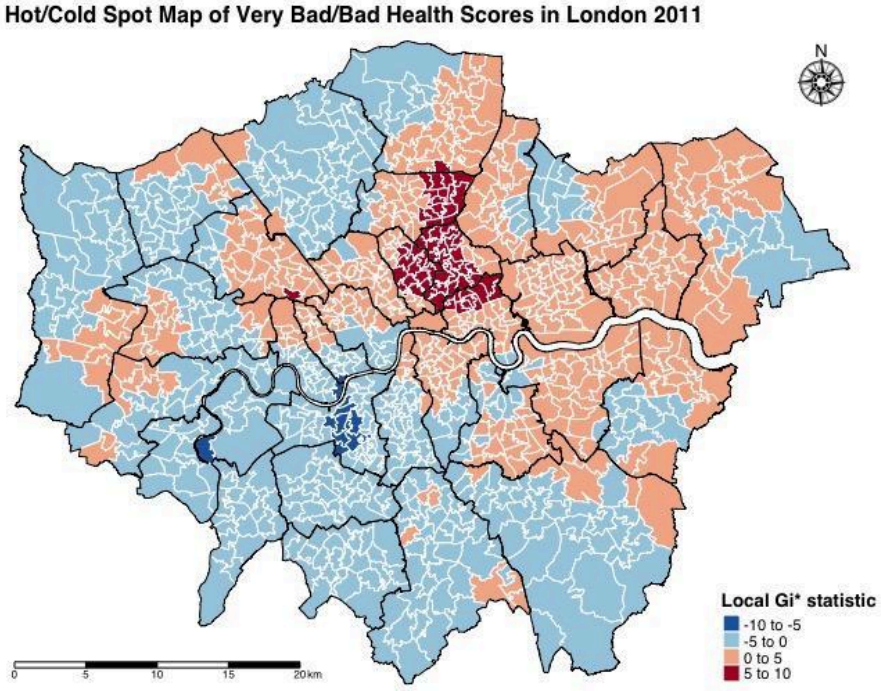


General health scores across London

From Table 1, we can see that for each score, the data is positively skewed since mean values are higher than median values. This makes sense due to the nature of the data.

	Very good health	Good health	Fair health	Bad health	Very bad health
Mean	4199.0	2773.0	930.9	310.6	101.9
Median	4080.0	2719.0	925.0	305.0	99.0
Interquartile range	1002.0	685.0	298.5	133.0	52.0

Table 1: Statistic summaries of general health scores across London. Source: InFuse, n/a.



An effective way of presenting health scores is by using a 'hot' and 'cold' spot map which identify spatial clusters of a specified high or low valued health scores respectively (Livings and Wu, 2020).

From Map 4, we can see that there is a hot spot cluster of very bad/bad health scores specifically in east Haringey, Islington, west Hackney, and north Tower Hamlets. By comparison, there is a smaller region of cold spots in central Wandsworth and central Richmond upon Thames. In

terms of statistical significance, we can see that clusters of dark-red and dark-blue spots are associated with a 99 per cent confidence interval (Livings and Wu, 2020). Could there be a correlation between health and ethnicity indicators and locations of health services?

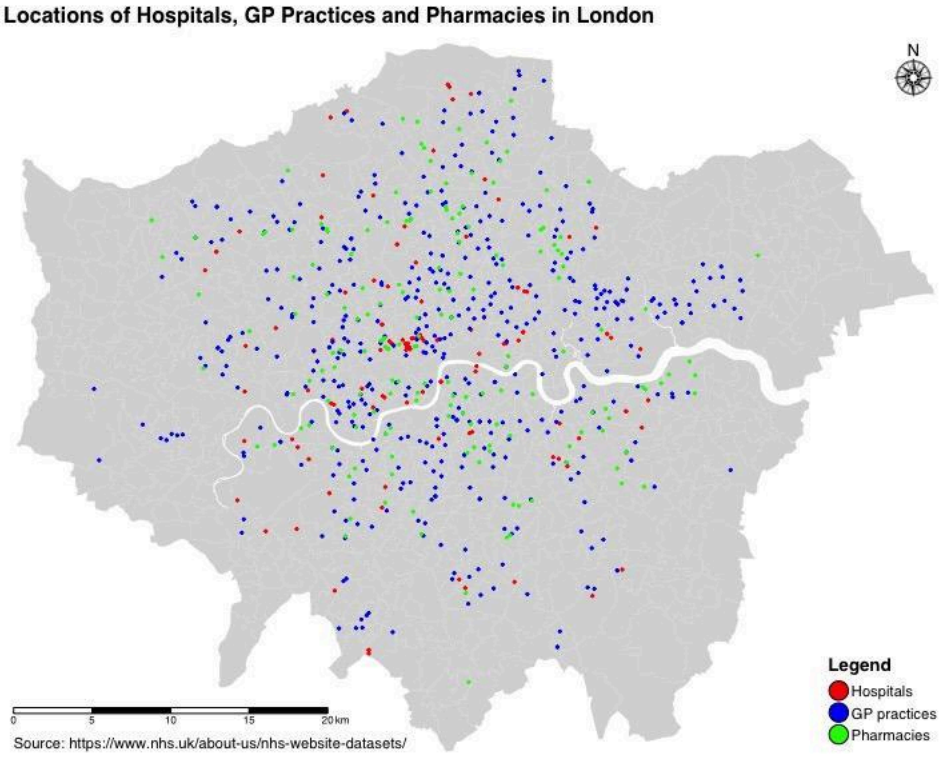
Map : Hot/Cold spot map of general health scores across London in 2011.

Locations of London's hospitals, GP practices and pharmacies

Map 5 indicates the spread of health services, namely hospitals, GP practices and pharmacies, across London, and thus indicates the level of accessibility.

As an evaluative point, it seems the data is concentrated in Inner London compared to Outer London. This is likely due to the nature of the dataset (NHS, 2020), since although it was cleaned as much as possible, when filtering the data to get information just about London, some of the information did not specify whether it was in London or not. For example, it would state the city was Ealing for that health service, but not that it was in London. To combat this, the 'Find and Replace' tool was utilised by typing each borough name and replacing it with 'London', although it is likely that some data points were still missing.

Furthermore, according to Evans *et al.* (2022: 4), there is no correlation suggesting that more accessibility to services such as pharmacies in deprived areas would encourage more consultations. Would increasing healthcare infrastructure help bridge this inequality, and do other aspects need to be considered as well, such as the increasing diversity of London?



Map : Locations of hospitals, GP practices and pharmacies across London.

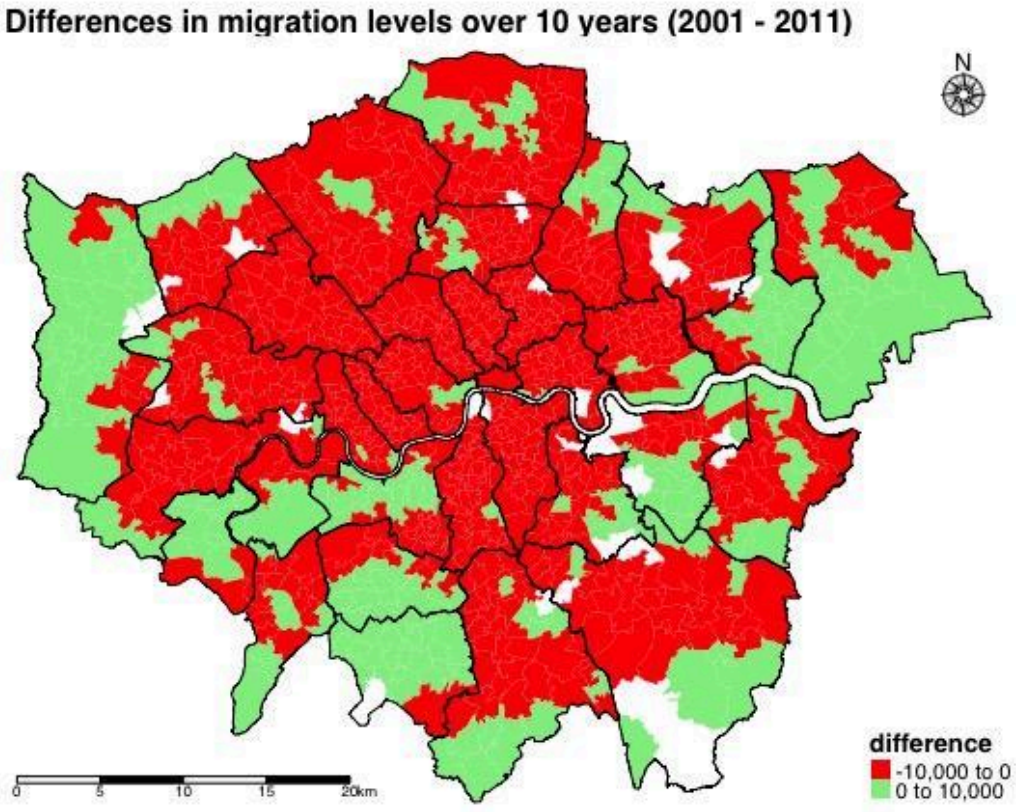
Differences in migration levels

To see how healthcare pressures have been intensified, this map looks at the differences in migration levels from 2001 to 2011 using data from the UK census (InFuse, n/a). This is an important aspect of London's identity, since "nearly a half of the UK's migrants live in London" (Gidley, 2011). This variance was calculated using 'country of birth' statistics in both years.

One reason for this is when the European Union saw an enlargement of ten countries joining this economic integration in 2004 (Foreign and Commonwealth Office, 2004: 5), causing an influx of workers seeking employment opportunities.

Map 6 indicates that generally, migration rates decreased within Inner London over the ten-year period, whilst it increased in Outer London. This does not necessarily mean that migrants moved out of London, it is more so likely that it became more expensive to live in Inner London compared to Outer London, due to factors such as gentrification, which also contributes to displacement (Trust for London, n/a).

Following the Brexit referendum in 2016, it is likely that future statistics, namely the 2021 census data, will show a further decline in migrant levels (Kierans, 2020). This is because leaving the European Union makes movement of labour to the UK became much more difficult due to barriers of entry.

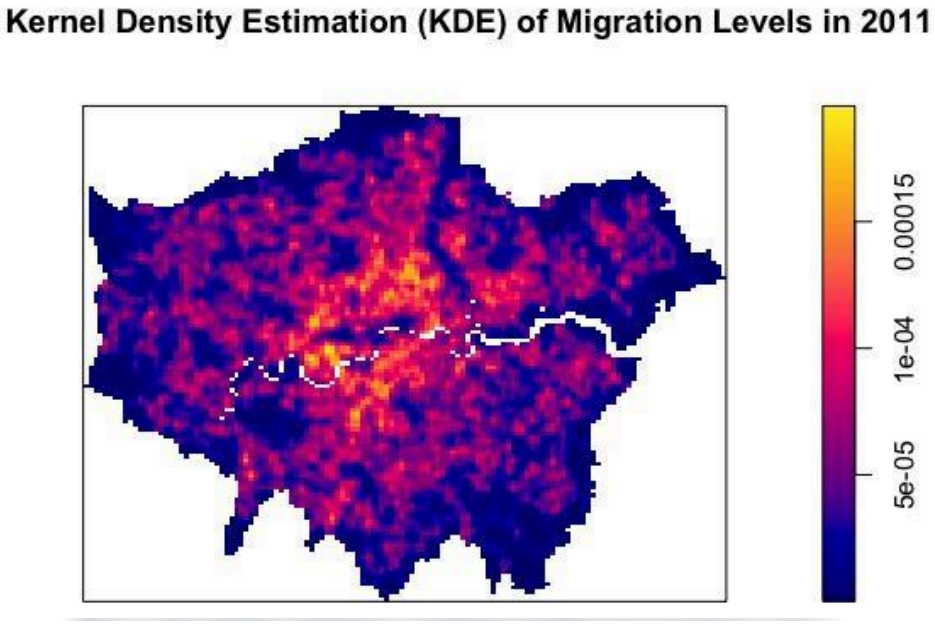


Map : Difference in migration levels from 2001 to 2011.

Point pattern analysis of migration levels to London in 2011

For more in-depth analysis, to determine if there is a correlation between ethnicity and healthcare provision, we can use point pattern analysis and specifically Kernel Density Estimation (KDE) (Yin, 2020). As a density-based technique, we can see in Map 7 there are areas of high density of migration towards central London when using a fixed bandwidth of 300 meters. A fixed bandwidth was used over an adaptive bandwidth since we are defining densities of migration in a "geographical space" instead of population (Shi, 2010: 648).

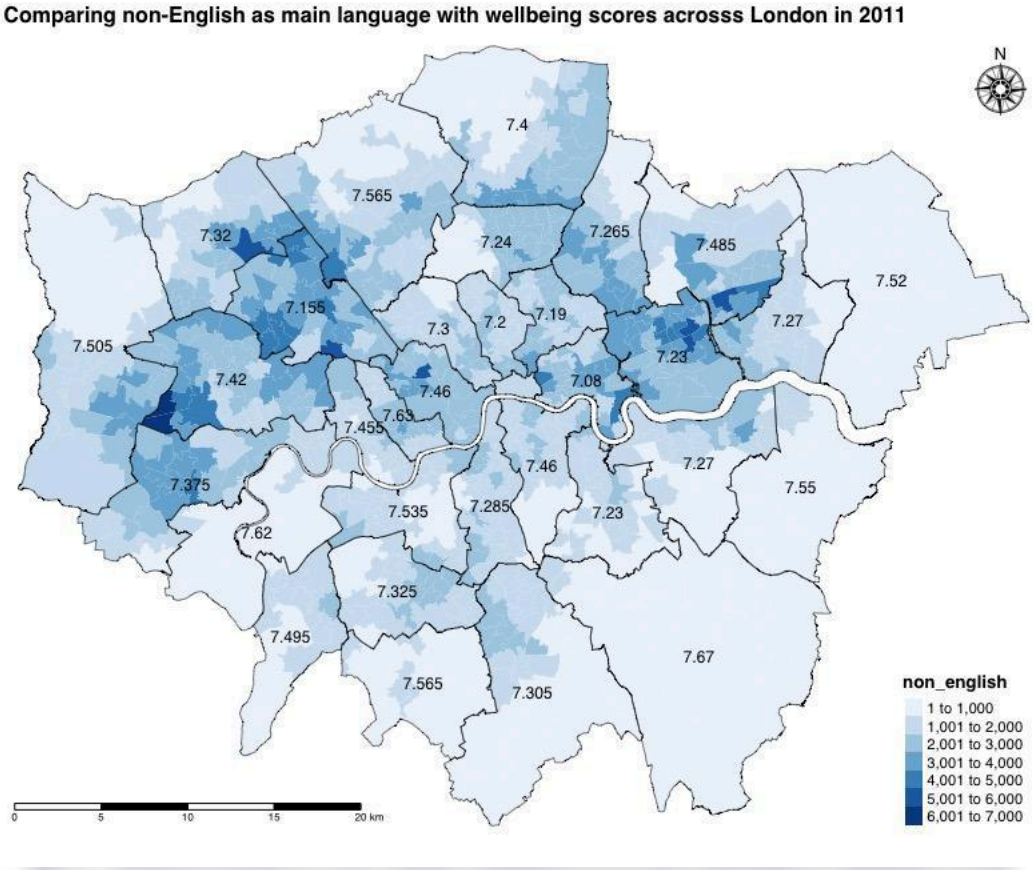
In general, Map 7 shows that migration levels across London may seem to be a spatially random process, yet there are areas of higher density that can be singled out, such as Islington, Hackney, Wandsworth, and Lambeth.



Connecting wellbeing scores with ethnicity distribution

Whilst London is known for its diversity, those from ethnic minorities still experience discrimination and bias, which is further extended within the healthcare system (British Broadcasting Corporation, 2022).

From Map 8, which combines both health and ethnic indicators, it shows that generally areas with more non-English speakers (as their main language) correlate with lower well-being scores. Particularly, the difference between Brent (more non-English speakers) and Bromley (less non-English speakers) is 0.515. However, this difference also considers variations in living standards, although it can be argued this is a contributor to the overall health of an individual, which includes their mental well-being also.



Conclusion

To answer the research question set out before, we can see that to a greater extent there is some correlation and association between certain ethnic groups and lower exposure to proper healthcare, namely with ethnic minorities such as Asian or Black. To a lesser extent, increased access to healthcare services like pharmacies may not be as effective in bridging this inequality gap, as according to Map 5. This social atlas has examined factors that may have contributed to this disparity, such as life expectancies, migration levels and wellbeing scores.

Since COVID-19, there has been increased use of an online triage system, to help reduce pressures on the NHS (Ungoed-Thomas, 2022). But will racial and ethnic discrimination still be a prominent issue and how can this be solved?

There are many ways that this inequality can be lessened, such as improving citizens' quality of life through increasing accessibility to healthcare, reducing poverty, and increasing education to promote ethnic minorities to take up healthcare professions. With projections of ever-increasing "hyper-diversity" (Atherton and Mazhari, 2018) in London, it is vital that ethnic minorities are heard in the healthcare community.

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