Unpacking mental health disparities among immigrant and domestic-born populations in the UK

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Abstract

This study uses wave 7 of the UK Household Longitudinal Study to investigate mental health disparities between immigrant and UK-born populations, and across immigrant sub-groups. In turn, it assesses the "healthy immigrant effect" – tendency of recent immigrants to be healthier than the native-born – and the hypothesised subsequent process of unhealthy assimilation. Results from linear regressions used in this cross-sectional design reveal that recent immigrants do exhibit a mental health advantage over UK natives, which diminishes significantly for those who have lived in the UK for over 15 years. This study also addresses knowledge gaps left in the literature by the frequent aggregation of all immigrants into a single unit of analysis. I find no significant mental health disparities between immigrants with varying migration reasons, nor do I observe differences in mental health decline across distinct ethnic groups.

1 Introduction

Addressing mental health needs has become a global public health priority, established as a prime objective within the United Nations Sustainable Development Agenda (UN, 2015). With one in five adults reporting some evidence of depression or anxiety in 2022, and a trend on the rise (ONS, 2024), the UK is not immune to this necessity to support the well-being of residents. In addition to its frailty, mental health in the UK is characterised by concerning inequalities, with disparities across sexual orientations (Bai et al., 2024), and ethnic groups (Bamford et al., 2021).

Immigrants have been found to be particularly at risk in many Western countries due to factors such as social exclusion, discrimination in the labour force, and difficulty to access healthcare resources (Elshahat & Moffat, 2022). As they increasingly drive population growth in the UK (Sturge, 2024), the need to understand the determinants of immigrants' mental health challenges has become critical. Research tackling this question has often been undermined by conceptual, study design, and measurement issues (Elshahat et al., 2022). Studies tend to lack clarity in their definitions of immigrant and domestic-born groups, and often fall short in considering crucial differences within

immigrant populations, based on ethnicity and migration context for example. These limitations have led to inconsistent evidence on the differences in mental health among immigrants, and between immigrants and domestic-born populations, as well as how they evolve over the life course.

This paper addresses these research questions in the UK via a cross-sectional approach. After outlining the main theories guiding the literature, I use data from wave 7 of the Understanding Society survey (University of Essex, 2024) to examine immigrants' mental health, how it differs among sub-groups and evolves over time. I find that immigrants in the UK generally exhibit better mental health than natives upon arrival, regardless of their reason to migrate. Additionally, I find that this advantage diminishes over time, and is not moderated by ethnicity. I then discuss how these findings compare to the literature and their implications, and conclude by laying out the limitations of my approach.

2 Literature review

2.1 Healthy immigrant effect

The "healthy immigrant effect" (HIE) refers to the observation that immigrants often display better health outcomes, both physical and mental, than the native-born populations of their destination country (Kennedy et al., 2015; McDonald & Kennedy, 2004). This finding, often coined as "immigrant health paradox," seems discrepant with the stressors immigrants are likely to experience before and during the migration and settlement. To explain this conundrum, studies have called upon three processes (Ferrara et al., 2024). First, the *selectivity hypothesis* argues that immigrants tend to be selected on health, personality, and socioeconomic factors which make them more resilient to the challenges associated with migration, and positively influence their current mental health (Florian et al., 2021). Increasingly selective immigration policies, including in the UK, induce a selection on their end as well (Brunori, 2024). The second, so-called *cultural hypothesis*, posits that immigrants 'import' favourable health behaviours, such as lower smoking, which improve their health (Riosmena et al., 2017). The third explanation regards the data gathering '*salmon bias*' resulting from the tendency of less healthy immigrants to return to their birth country (Lu & Qin, 2014; Palloni & Arias, 2004). I examine the HIE hypothesis in the UK context.

H1: Immigrants exhibit better mental health than UK-born individuals (HIE).

The conceptualisation of a general immigrant health effect, present in many studies, is however deeply flawed due to the aggregation of immigrants with vastly different backgrounds. Compared to a voluntary immigrant, a refugee will have had more chances to

be exposed to intense stressors, such as trauma or bad hygiene in camps, which deteriorate mental health (van de Wiel et al., 2021). However, as highlighted by Elshahat and Moffat (2022) in their review, no study performs an immigrant mental health analysis by immigration status. The Understanding Society survey unfortunately does not contain data on refugees, but it includes immigrants' reasons for migrating. This variable can act as a proxy for the voluntary/refugee divide because it captures key elements of migration context that influence exposure to stressors. For instance, immigrants who cite safety concerns as their primary reason for migration are likely to have faced pre-migration stressors akin to those experienced by refugees, such as political persecution or the need to flee unsafe living conditions. In contrast, individuals who migrate for reasons such as education or employment are less likely to have endured such extreme circumstances and may have had greater control over the migration process. I therefore expect reason to migrate to moderate recent immigrants' mental health advantage.

H2: Immigrants who migrated because they did not feel safe in their country of birth have worse mental health than those who moved for education or work.

2.2 Unhealthy assimilation effect

The literature has reached a consensus that the healthy immigrant effect deteriorates as immigrants assimilate, in Europe (Bousmah et al., 2019) and the North America (Antecol & Bedard, 2006; Kwak, 2018). Studies find that immigrants' mental health worsens faster than that of domestic-born people, ultimately levelling across both populations. This "unhealthy assimilation" is usually explained by processes including the adoption of unhealthy habits, acculturation stress, discrimination, and poor economic and social conditions (Ferrara et al., 2024). I therefore formulate the following "recency hypothesis", sometimes called "years since immigration effect".

H3: Non-recent immigrants display lower mental health levels than recent migrants.

Once again however, this general hypothesis obscures differences across immigrant sub-groups. The stress process model (Pearlin, 2010; Pearlin & Bierman, 2013) suggests that mental health is primarily shaped by exposure to stressors and the availability of coping strategies and social support. In the UK, many stressors disproportionately impact people from minority ethnic backgrounds. These include racial discrimination and harassment (Nandi et al., 2020), and discrimination in the job market (Montazer, 2020; Zwysen et al., 2021). Availability of social support is also disparate across ethnicities (Ehsan & Silva, 2015). Consequently, I expect that the unhealthy assimilation effect will disproportionately affect immigrants from minority ethnic backgrounds.

H4: The deterioration in mental health between recent and non-recent immigrants is stronger for those from minority ethnic backgrounds than for White immigrants.

3 Methods

3.1 Data & variables

3.1.1 Dataset & study population

The UK Household Longitudinal Study (UKHLS), also known as Understanding Society (University of Essex, 2024), is a large-scale panel survey that started in 2009. I use data from wave 7, which contains data collected from January 2015 to May 2017. From this wave, about 60% of households were originally sampled at wave 1. Many others originate from the ethnic minority boost (EMB), and immigrant and ethnic minority boost (IEMB) samples respectively incorporated in waves 1 and 6. They have significantly improved the sample's representativeness of immigrants in terms of educational attainment, gender distribution, and migration reasons (Lynn et al., 2018).

I excluded individuals (1) aged below 16 or above 80 (2) with missing information on the relevant variables (3) born in the UK but with at least one foreign born parent (2nd generation).

3.1.2 Variables

The outcome variable of mental health is operationalised using the SF-12 Mental Component Summary (PCS), which asks respondents to rate how different aspects of their mental health have impacted their recent daily life. Questions include the frequency of feeling down and gloomy, calm and relaxed or energetic, as well as limitations in achievement, sociality and carefulness in tasks due to mental health (Holz, 2021). Scores are normalised, and range from 0 to 100, with a mean of 50 and standard deviation of 10, and higher values indicating better health.

The main independent variable is nativity, separating UK natives (born in the UK and both parents born in the UK), and immigrants (born abroad). Recency of immigration is dichotomised, using a threshold number of years since migration (ysm), into recent immigrants (ysm ≤ 15) and non-recent immigrants (ysm > 15), in line with other studies (Breslau et al., 2007; Choi et al., 2016; Schutt et al., 2019). Recoding the variable as categorical, as done by Kaplan et al. (2015), was considered but shrunk the number of cases within certain categories too severely.

Another independent variables categorises immigrants depending on their reason to migrate. The 8 categories of UKHLS were collapsed into 5, following the mapping given in Table A.1, and missing values (29.5%) were coded as Unknown. Migration reasons include family, work and education, simply wanting to live in the UK, and feeling unsafe in the country of birth due to political reasons. Lastly, ethnicity was included as an independent variable of interest, following the UK Census mapping (ONS, 2022).

A set of controls, determined as factors consistently shown in the literature to influence

mental health outcomes, and that may confound the relationship between immigration status and mental health, was included. Those consist of age (linear and quadratic terms), sex (binary), highest educational qualification (tertiary, lower than tertiary, secondary, lower), and unemployment. Table 1 presents descriptive statistics for the sample.

3.2 Statistical analysis

3.2.1 Analytical strategy

I explore the predictors mental health in the study sample using linear regression models with survey weights. The analysis unfolds in two parts. In the first, I sequentially focus on differences in mental health between immigrants and UK natives, and between immigrants whose migrations were motivated by different reasons. All are examined before any potential effect of assimilation; therefore, I exclude non-recent immigrants from the analysis. Across recently arrived immigrants and UK natives, the predicted mental health of person i follows simplified Equation 1

$$MH_i = \alpha + \beta_1 Immigrant_i + \sum \gamma_n (Immigrant_i \cdot Reason_{n,i}) + \mu X_i + \varepsilon_i \tag{1}$$

where α is the intercept, and $Immigrant_i$ is the dummy variable for being an immigrant. $\sum \gamma_n (Immigrant_i \cdot Reason_{n,i})$ is the interaction between this dummy and migration reasons, included to determine whether the mental health effect of being an immigrant differs depending them. The migration reason variable only applies to immigrants; therefore, the main effect was exceptionally not included. X_i is the vector of control variables for age (linear and quadratic), ethnicity, and unemployment, education, with μ being the vector of their corresponding coefficients. ε_i is the error term.

The second part of the analysis turns to the effect of assimilation on immigrants' mental health. Therefore, the sample is reduced to its immigrant population only, and non-recent immigrants are reintegrated to the analysis. Immigrants' mental health is predicted with simplified Equation 2

$$\begin{aligned} MH_i = \alpha + \beta_1 Non\text{-}Recent_i + \sum \beta_{k+1} Ethnicity_{k,i} + \\ \sum \gamma_k (Non\text{-}Recent_i \cdot Ethnicity_{k,i}) + \mu X_i + \varepsilon_i \end{aligned} \tag{2}$$

$Non\text{-}Recent_i$ indicates that immigrant i has lived in the UK for more than 15 years. $\beta_1 Non\text{-}Recent_i$ is the effect of belonging to this group on mental health. The interaction term $\sum \gamma_k (Non\text{-}Recent_i \cdot Ethnicity_{k,i})$ is incorporated to test whether ethnicity moderates the relationship between extended residency in the UK and immigrants' mental health.

Furthermore, discrimination in the labour market is expected to be one of the drivers of the disparate mental health effects of assimilation. Unemployment is therefore excluded from the specification of this second equation and corresponding models.

The models are constructed via a stepwise process (Jang et al., 2023). Based on Eq. 1, Model 1 only includes the main effect of being an immigrant status. Model 2 adds the controls, and Model 3 the interaction term between immigration and migration reason. Turning to Eq. 2, Model 4 only contains the main effects of non-recency and ethnicity, Model 5 adds the controls, and Model 5 the interaction term of interest.

The analysis is weighted using cross-sectional weights provided for wave 7. These weights compensate for the over-representation of certain groups and regions induced by the sampling design, for selection into non-response, and for attrition since the first wave (Brunori, 2024).

4 Results

4.1 Descriptive statistics

Table 1 presents the summary statistics of the study sample, consisting of 30,802 individuals, with immigrants making up 16.1% (n = 4,964) and exhibiting a slightly lower average mental health score (48.8 vs. 49.1 for UK-born). Additionally, immigrants are more likely to belong to non-White ethnic groups and to have tertiary education (48.2% vs. 36.5% for UK-born), though a notable proportion (21.1%) has qualifications below secondary level, indicating heterogeneity in educational attainment. The extent of unemployment is similar across immigrants and natives. Finally, the most common reason for migration is family-related (42.5%), while only 2.5% migrated for political safety.

Variable	Overall	Immigrants	UK-born
Observations	30802	4964	25838
SF-12 MCS, mean (SD)	49.0 (10.3)	48.8 (10.2)	49.1 (10.3)
Has lived in the UK for 15+ years, n (%)			
Yes	3961 (12.9)	3961 (79.8)	–
No	951 (3.1)	951 (19.2)	–
Sex, n (%)			
Female	17052 (55.4)	2841 (57.2)	14211 (55.0)
Male	13750 (44.6)	2123 (42.8)	11627 (45.0)
Age, mean (SD)	47.5 (17.4)	45.3 (15.2)	48.0 (17.8)
Ethnicity, n (%)			
Asian or Asian British	2355 (7.6)	2031 (40.9)	324 (1.3)
Black, Black British, Caribbean or African	1036 (3.4)	896 (18.0)	140 (0.5)
Mixed or Multiple	390 (1.3)	179 (3.6)	211 (0.8)
Other ethnic group	288 (0.9)	253 (5.1)	35 (0.1)
White	26733 (86.8)	1605 (32.3)	25128 (97.3)
Highest Qualification, n (%)			
Tertiary	11828 (38.4)	2393 (48.2)	9435 (36.5)
Less than tertiary	6779 (22.0)	855 (17.2)	5924 (22.9)
Secondary	6445 (20.9)	670 (13.5)	5775 (22.4)
Lower	5750 (18.7)	1046 (21.1)	4704 (18.2)
Unemployed, n (%)			
Yes	1222 (4.0)	266 (5.4)	956 (3.7)
No	29580 (96.0)	4698 (94.6)	24882 (96.3)
Reason for Migrating, n (%)			
Unknown	1465 (4.76)	1465 (29.5)	–
Work/Education	994 (3.2)	994 (20.0)	–
Family	2112 (6.9)	2109 (42.5)	–
Political safety	124 (0.4)	124 (2.5)	–
Wanted to live in UK	122 (0.4)	121 (2.4)	–
Other	155 (0.5)	151 (3.0)	–

Table 1. Descriptive statistics.

4.2 Healthy immigrant effect

Table 2 presents results from linear regressions examining the relationship between immigration status, migration reasons, and mental health. Model 1 provides a baseline, showing that recent immigrants, on average, have a slightly higher mental health score than UK-born individuals. Although a first source of support for the HIE, this relationship could be confounded by omitted variables. In Model 2, after controlling for socio-demographic factors, the mental health advantage of recent immigrants over UK natives has increased, reaching 2.8 on the normalised 0-100 scale. Furthermore, it has retained its statistical significance. This finding supports the healthy immigrant effect hypothesis (H1).

Incorporated in Model 3, none of the interactions between being an immigrant and reasons to migrate exhibits statistical significance. Furthermore, their inclusion does not improve the adjusted R^2, reflecting the absence of a significant role of migration reason on immigrants' mental health upon arrival. This finding provides support against H2, although potentially undermined by the small number of immigrants who stated political safety as their reason to migrate.

Turning to the controls, across all models, being a woman, lower education levels, and being unemployed are statistically significantly associated with worse mental health, with unemployment having the strongest effect (-4.8). Individuals belonging to Mixed or multiple ethnic groups also report worse mental health than White respondents. Notably, as discussed later in the robustness evaluation, R^2 values remain rather low, indicating limitations in the models' capacity to explain variance in mental health.

	SF-12 Mental Component Summary		
	(1)	**(2)**	**(3)**
Immigrant	1.19 (0.32)*	2.81 (0.41)***	3.05 (0.79)***
Immigrant * Reason for migration$_n$			
Political (felt unsafe)			-1.59 (3.02)
Family			0.26 (0.77)
Work/Education			-1.16 (3.02)
Wanted to live in UK			0.65 (3.02)
Sex (male)		2.27(1.12)***	2.27 (0.12)***
Age		-0.12 (0.02)***	-0.12 (0.02)***
Age^2		0.01 (0.00)***	0.01 (0.00)***
Ethnicity (ref = White)			
Asian or Asian British		0.96 (0.47)*	0.92 (0.47)
Black, Black British, Caribbean or African		0.31 (0.69)	0.27 (0.70)
Mixed or multiple		-2.07 (0.74)**	-2.05 (0.74)**
Other		-2.07 (1.17)	-2.08 (1.16)
Education (ref = Tertiary)			
L/t tertiary		-0.61 (0.17)***	-0.62 (0.17)***
Secondary		-0.75 (0.17)***	-0.75 (0.17)***
L/t secondary		-2.41 (0.19)***	-2.42 (0.19)***
Unemployed		-4.82 (0.49)***	-4.81 (0.48)***
Intercept	49.06 (0.06)***	47.12 (0.57)***	47.11 (0.57)***
R^2	0.03	0.13	0.13
Adj. R^2	0.03	0.13	0.12
N (Observations)	26779	26779	26779

Note: Significant effects indicated with *** $p < .001$, ** $p < .01$, * $p < .05$. Regression is weighted using cross-sectional weights provided for wave 7. Heteroscedasticity robust standard errors are shown in parentheses.

Table 2. Mental health by immigrant status and reasons to migrate.

4.3 Unhealthy assimilation effect

Table 3 presents the results of regression models examining the impact of assimilation, as measured by living in the UK for more than 15 years, on immigrants' mental health, and whether this relationship is moderated by ethnicity. Model 4 reveals that immigrants who have been in the UK for over 15 years report significantly lower mental health scores on average, controlling for ethnicity (-1.16 out of 100). This provides preliminary support for the hypothesis of unhealthy assimilation (H3). This effect remains consistent and significant in Models 5 and 6, after accounting for socio-demographic factors. Asian immigrants display substantially lower mental health compared to White immigrants. Conversely mental health differences between Black immigrants, those from mixed or multiple ethnicities, and White immigrants are not statistically significant after controls are added in Model 5.

Model 6 tests interactions between ethnicity and being a non-recent immigrant. It provides evidence against H4. Indeed, none of the interaction terms are significant, suggesting no differential effect of assimilation across ethnic immigrants sub-groups.

	SF-12 Mental Component Summary		
	(4)	**(5)**	**(6)**
In the UK for 15+ Years	-1.16 (0.36)**	-1.79 (0.40)***	-1.79 (0.64)**
In the UK for 15+ Years * Ethnicity$_k$ (Ref = White)			
Black, Caribbean or African			-0.02 (1.09)
Asian			-0.34 (0.84)
Mixed or multiple			1.93 (2.54)
Other			1.66 (1.82)
Sex (male)		1.37(0.29)***	1.37(0.29)***
Age		-0.07 (0.06)	-0.07 (0.06)
Age^2		0.00 (0.00)*	0.00 (0.00)*
Ethnicity (ref = White)			
Asian	-1.58 (0.34)***	-1.06 (0.36)**	-0.79 (0.73)
Black, Caribbean or African	0.08 (0.42)	0.52 (0.44)	0.54 (0.98)
Mixed or multiple	-1.40 (0.82)*	-1.18 (0.82)	-2.87 (2.38)
Other	-2.28 (0.76)**	-2.15 (0.77)**	-3.39 (1.58)*
Education (ref = Tertiary)			
L/t tertiary		-1.78 (0.43)***	-1.78 (0.43)***
Secondary		-0.97 (0.46)*	-0.97 (0.46)*
L/t secondary		-1.78 (0.39)***	-1.78 (0.39)***
Intercept	50.57 (0.38)***	52.26 (1.79)***	52.29 (1.84)***
R^2	0.05	0.08	0.08
Adj. R^2	0.05	0.08	0.07
N (Observations)	4908	4908	4908

Note: Significant effects indicated with *** $p < .001$, ** $p < .01$, * $p < .05$. Regression is weighted using cross-sectional weights provided for wave 7. Heteroscedasticity robust standard errors are shown in parentheses.

Table 3. Immigrants' mental health by recency of immigration and ethnicity.

4.4 Model diagnostics

For binary and categorical variables, the linearity assumption of OLS is trivially met. The only continuous independent variable is age. Since it does not display a clear linear relationship with mental health (see Figure B.1), and based on findings highlighting a non-linear trajectory of well-being over the life-course (Jeste & Oswald, 2014), a quadratic term was added. Although the plot of residuals against fitted values (Figure B.2) does not show alarming signs of heteroscedasticity, the Breusch-Pagan test indicates a violation of homoscedasticity for both fully specified models (Table B.1). This finding led to the use of heteroscedasticity-robust standard errors in all models.

The Q-Q plots (Figure B.3) reveal moderate deviations of residuals from normality, particularly in the lower tails. However, given the robustness of OLS to mild violations of normality, this departure is not considered problematic for inference. Finally, the variance inflation factors (VIF) analysis (Table B.2) shows no concerning levels of multicollinearity in Model 3. Model 6 exhibits slightly higher VIFs, but these remain within acceptable bounds for OLS estimation

4.5 Robustness analysis

The rather low R^2 values throughout the analysis suggest that unobserved predictors may contribute to mental health outcomes, potentially introducing bias into the estimates. However, re-estimating the models with additional controls, such as detailed labour force and marital status, yielded only marginal increases in R^2, and substantially reduced the sample size due to missing data. A thorough review of the literature supports the conclusion that no critical predictors of mental health were omitted from the analysis.

During data pre-processing, I set this study's immigration 'recency' threshold at 15 years, following previous literature (Breslau et al., 2007; Choi et al., 2016; Schutt et al., 2019). However, other studies use different thresholds: 5 years in King et al. (2019), and 10 years in Kwak (2016) for example. I therefore tested the sensitivity of my non-null finding for the unhealthy assimilation hypothesis (H3). As shown in Figure C.1, the negative association between being an established immigrant and mental health remains consistent across all thresholds ranging from 10 to 25 years, with estimates ranging from -1.7 to -2.2, suggesting that the finding is robust to different specifications of what constitutes a 'recent' immigrant.

5 Discussion

Prior research on immigrant mental health has often been limited by unclear definitions of their study populations and aggregation of all immigrants into a singular group (Elshahat et al., 2022). This study therefore mainly contributes to the literature by offering a

nuanced analysis of the healthy immigrant effect and unhealthy assimilation hypothesis. Moreover, it bridges a gap of UK-based evidence on these phenomena, for which research has been primarily focused on the United States and other European countries (Elshahat et al., 2022).

The results lend support to the healthy immigrant effect (H1), as recent immigrants exhibit significantly higher mental health scores compared to UK-born individuals (3 points out of 100 on average). On the other hand, they do not support the hypothesis that migration reasons influence mental health outcomes for recently arrived immigrants (H2). While the absence of a significant interaction may stem from data limitations discussed further below, they do suggest that the mental health advantage associated with the HIE may be more universal across immigrant subgroups than expected.

Consistent with the literature, the analysis supports the hypothesis of an unhealthy assimilation (H3). Immigrants who have lived in the UK for over 15 years display significantly lower mental health scores, a finding that reinforces the well-documented trajectory of declining well-being among long-term immigrants resulting from the challenges of sustained integration (Antecol & Bedard, 2006; Choi et al., 2016; Jang et al., 2023). Notably, this finding is largely insensitive to changes in the threshold from which an immigrant is no longer considered 'recent'. However, the hypothesis that unhealthy assimilation is more pronounced for ethnic minority immigrants (H4) is not supported, indicating that the decline in mental health related to extended stay is not moderated by ethnic background. Given the well-established link between discrimination and mental health disparities (Ehsan & Silva, 2015; Montazer, 2020), this lack of differential effects is puzzling. It may suggest the presence of resilience factors that shield immigrants' mental health from the adverse effects of discrimination (Brunori, 2024; Mendenhall & Kim, 2021; Panter-Brick, 2014). Understanding these protective factors represents an interesting avenue for future research.

A key limitations of this study is the data's inability to capture the experiences of refugees, who have been found to be less likely to be in employment than other migrant groups and UK natives, and reporting mental health problems substantially more often than other migrants (Kone et al., 2019; Ruiz & Vargas-Silva, 2018). Indeed, the UKHLS sample only includes voluntary immigrants. While migration reasons were used as a proxy to operationalise migration contexts, they cannot fully capture the differences between voluntary migration and refugee experiences. While some studies incorporate data on refugees (Bassey & Zaka, 2024; Elshahat & Moffat, 2022), they remain underrepresented in immigrant mental health research, and should therefore be the focus of further research.

Additionally, the cross-sectional design limits the study's ability to disentangle the effects of assimilation from baseline differences between immigration cohorts. Although scarce in the immigrant mental health literature, longitudinal research can best isolate the processes underlying mental health deterioration during the life course (Helgesson

et al., 2019). Notably, very recent research in the UK and Germany, respectively by Brunori (2024) and Ferrara et al. (2024) challenge the unhealthy assimilation hypothesis, finding evidence that mental health decline among immigrants is similar to that of natives. Further longitudinal research should assess whether this holds true across sub-groups.

As highlighted by Brunori (2024), finding that immigrants tend to keep good levels of mental health relative to UK-born individuals is not to be interpreted as an understatement of the gravity of the challenges and potential uprooting they experience. Instead, the findings of this paper serve as a reminder that we should not immediately assume an immigrant disadvantage when examining differences between immigrants and natives in a given outcome. Nevertheless, the presence of disproportionate stressors faced by immigrants, whether they lead to substantial mental health deterioration – as found in this research – or are mitigated by resilience factors, call for the development of mental health interventions for immigrants (George et al., 2015).

6 Conclusion

Using cross-sectional data from the Understanding Society survey and a linear regression approach, I compared mental health differences between immigration groups and native British. Evidence of the "healthy immigrant effect" was uncovered, theorised as a result of diverse selection processes and favourable health behaviours. However, after 15 years since migration, immigrants showed a mental health decline, likely symptomatic of cultural, linguistic, and socio-economic stressors. Although hypothesised to be exacerbated by racist inequalities, the effects of an extended residence in the UK on immigrants' mental health were not found to be moderated by ethnicity.

The results of this study challenge (implicit) assumptions regarding immigrants' health outcomes, which have led researchers to view their observed advantages as 'paradoxical'. Most importantly, they highlight the need to tackle the well-documented challenges that restrict immigrants' access to mental healthcare, including discrimination, language barriers, and insufficient cultural sensitivity training for healthcare professionals (Ferrara et al., 2024).

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Appendix A. Mapping of migration reason categories

Original Category Code	Collapsed Category
For work (e.g. wanted to work and earn money in the UK)	Work/Education
Education (e.g. wanted to study here or take language class)	Work/Education
Joined partner or spouse already living in the UK	Family
Joined other family members already living in the UK	Family
Moved together with family members	Family
Political (did not feel safe in the country of birth)	Political safety
Simply wanted to live in the UK	Wanted to live in UK
Other	Other

Table A.1. Mapping of original UKHLS migration reason categories to collapsed categories. Reasons to migrate were collected from the 'mreason' variable of UKHLS.

Appendix B. Model Diagnostics

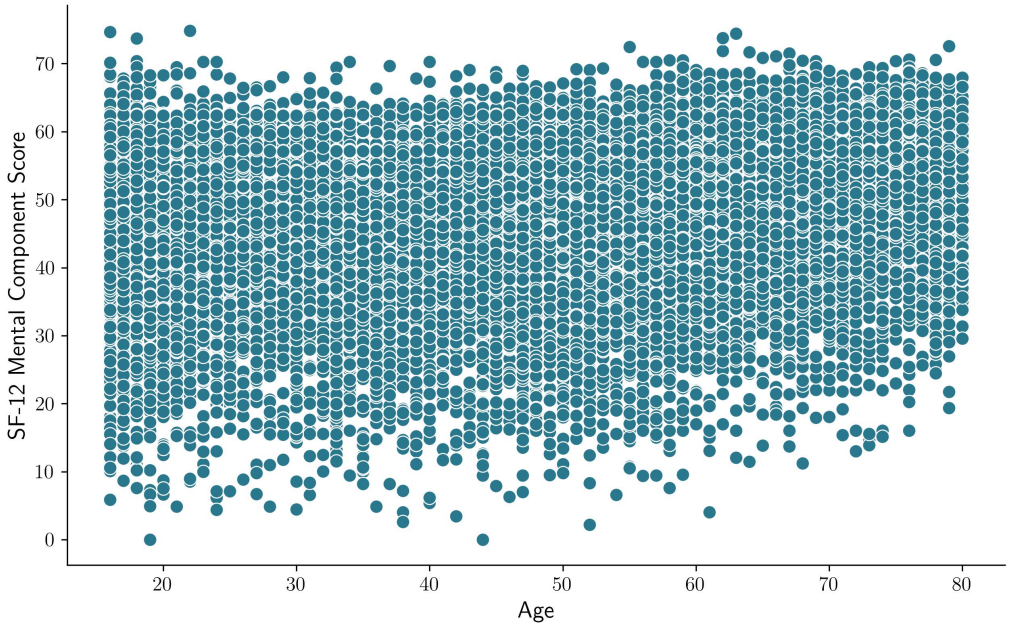

Figure B.1. Scatterplot of SF-12 Mental Component Score against age. The relationship between age and mental health does not exhibit a straightforward linear trend. Given studies which highlight a U-shaped trajectory of well-being across the lifespan (Jeste & Oswald, 2014), a quadratic term was added to the regression model to capture this potential non-linear relationship.

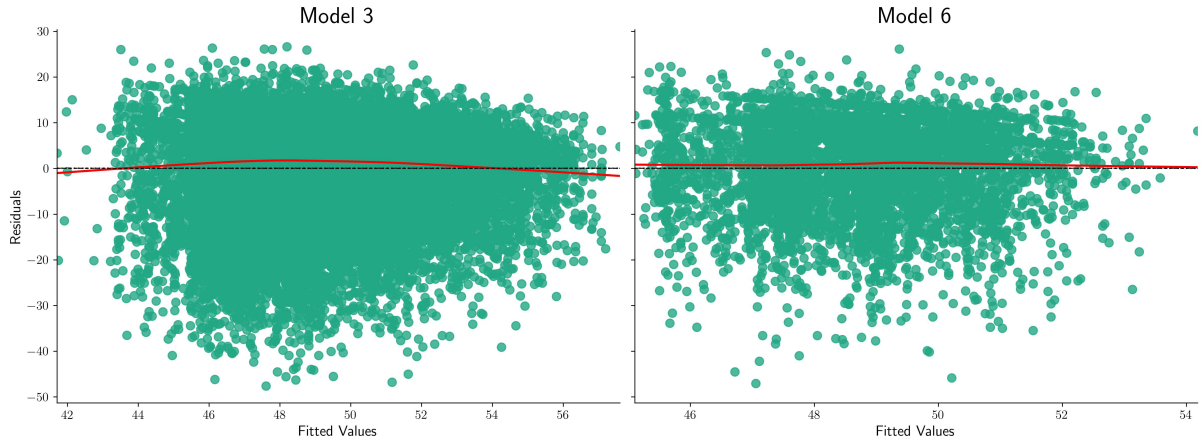

Figure B.2. Scatterplot of residuals against fitted values for fully specified models (3 and 6). The residuals appear scattered randomly around the horizontal line at zero. The linearity assumption seems reasonably satisfied, as there is no clear pattern or curvature (e.g., U-shape or inverted U-shape) in the residuals. The spread of residuals appears fairly consistent across the range of fitted values, suggesting no clear evidence of heteroscedasticity.

Model	Lagrange multiplier	p-value
Model 3	401.34	1.04e-67
Model 6	28.70	0.0176

Table B.1. Breusch-Pagan test for heteroscedasticity for fully specified models (3 and 6). The null hypothesis of homoscedasticity is rejected at a 5% significance level for both Model 3 and Model 6, suggesting heteroscedasticity. This finding warrants the use of heteroscedasticity-robust standard errors.

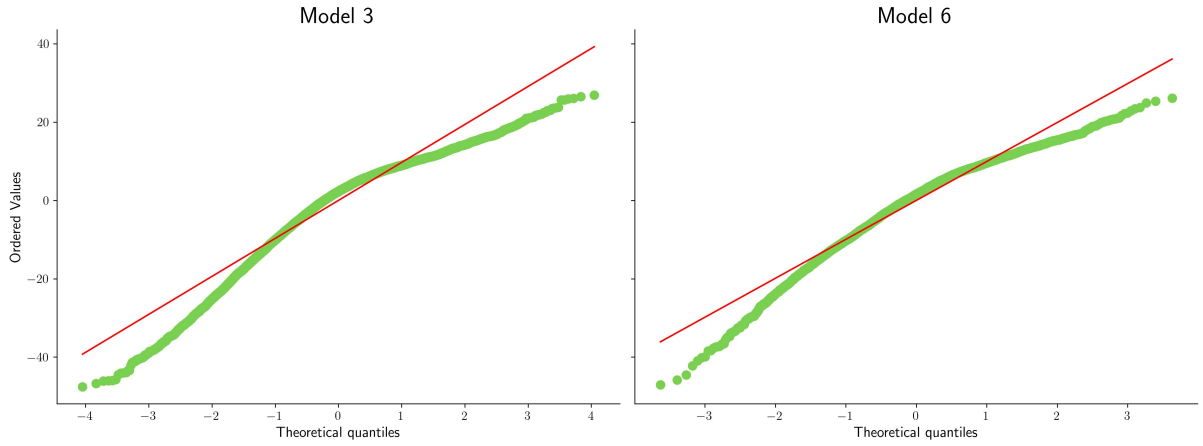

Figure B.3. Q-Q plots assessing normality of residuals for fully specified models (3 and 6). Both models show moderate deviations from normality, particularly in the tails, with more pronounced departures in the lower tail. This suggests some violation of the normality assumption, though the central portions of both distributions approximately follow the theoretical normal line.

Model	Variable	VIF
Model 3	Intercept	12.24
	Sex[Male]	1.01
	Ethnicity[Mixed or Multiple]	1.02
	Ethnicity[Asian or Asian British]	1.40
	Ethnicity[Black, Black British, Caribbean]	1.14
	Ethnicity[Other ethnic group]	1.07
	Education[L/t tertiary]	1.28
	Education[Secondary]	1.25
	Education[Lower]	1.30
	Immigrant	3.37
	Immigrant:Reason[Work/Education]	1.71
	Immigrant:Reason[Family]	2.04
	Immigrant:Reason[Political safety]	1.05
	Immigrant:Reason[Wanted to live in UK]	1.07
	Immigrant:Reason[Other]	1.07
	Age	1.20
Model 6	Intercept	23.00
	Non-recent[1]	3.24
	Ethnicity[Mixed or Multiple]	8.29
	Ethnicity[Asian or Asian British]	6.63
	Ethnicity[Black, Black British, Caribbean]	7.43
	Ethnicity[Other ethnic group]	4.57
	Sex[Male]	1.01
	Education[L/t tertiary]	1.15
	Education[Secondary]	1.12
	Education[Lower]	1.19
	Non-recent[1]:Ethnicity[Mixed or Multiple]	8.38
	Non-recent[1]:Ethnicity[Asian or Asian British]	7.65
	Non-recent[1]:Ethnicity[Black, Black British, Caribbean]	7.82
	Non-recent[1]:Ethnicity[Other ethnic group]	4.59
	Age	1.26

Table B.2. Variance inflation factor (VIF) analysis. For Model 3, the VIF values suggest no significant multicollinearity concerns as all values are close to 1. Model 6 exhibits slightly higher VIFs, which indicates a moderate multicollinearity, acceptable in OLS. In both cases, these values do not warrant the removal of a variable, or the use of dimensionality reduction.

Appendix C. Robustness analysis

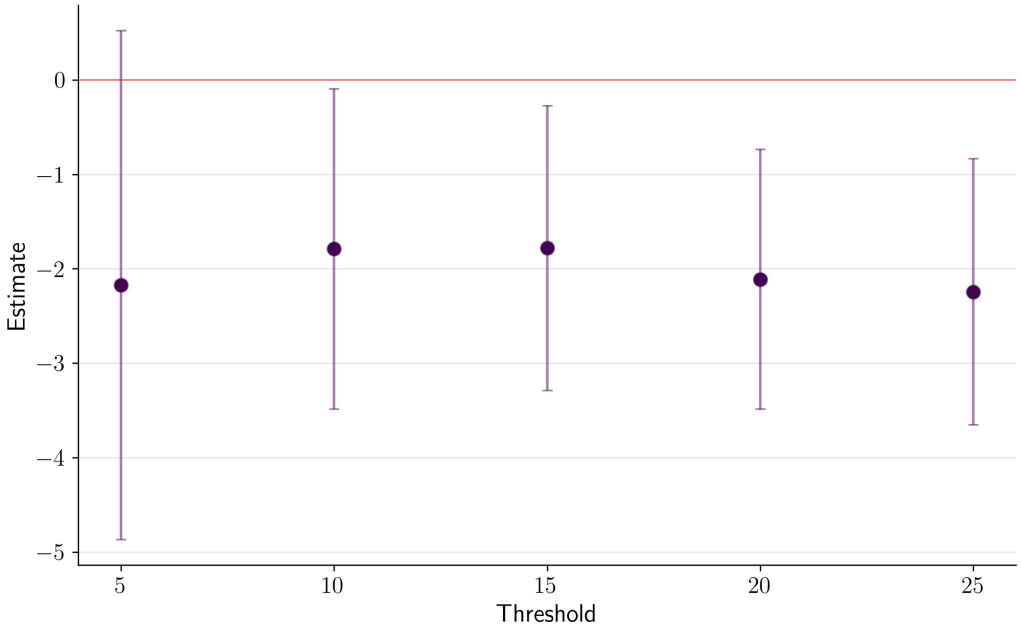

Figure C.1. Robustness check for immigration recency threshold. Points show estimated differences in mental health between recent and established immigrants at varying thresholds (from 5 to 25 years), with 95% confidence intervals. The horizontal red line at zero represents no difference between groups. Across all thresholds above 5 years, recent immigrants report consistently better mental health than established immigrants, supporting the robustness of the unhealthy assimilation hypothesis.

Appendix D. Code

For transparency and replicability, all code used in the data pre-processing, visualisation, and analysis has been centralised in a GitHub repository, which has been anonymised using the 'Anonymous GitHub' service. This repository is publicly accessible via the following link:
https://anonymous.4open.science/r/AAS-ImmigrantMH-7EF5