

**Swimming and Social Exclusion in the UK:  
A Multidisciplinary Exploration in the Human Sciences**



**Candidate Number: 1043532**

**Word Count: 9,996**

**A Dissertation Submitted for the BA in  
Human Sciences, 2022**

## Table of Contents

Table of Contents.....	1
Abstract.....	2
1.0 Introduction.....	3
2.0 Literature Review.....	6
2.1 The Importance of Swimming for Health and Community Building.....	7
2.2 Historical and Current Exclusion from Swimming Spaces.....	9
2.3 Embodiment of Exclusion.....	13
2.4 Summary.....	16
3.0 Methods.....	16
3.1 Study Area.....	16
3.2 Interviews.....	17
3.3 Spatial Analysis.....	18
3.4 Methodological Limitations.....	23
4.0 Interview Results and Discussion.....	24
4.1 Relationship to Swimming and its Importance.....	25
4.2 Exclusion and Barriers to Participation.....	26
4.3 Tackling Exclusion and Building an Inclusive Future.....	27
4.4 Summary.....	29
5.0 Spatial Analysis Results and Discussion.....	29
5.1 Correlations Between the Demographic Indicators.....	30
5.2 Kruskal-Wallis and Dunn’s Multiple Comparison Tests.....	31
5.3 Intersections Between the Pool Buffers and Demographic Indicators.....	34
5.4 Summary.....	36
6.0 Conclusion.....	36
References.....	38
Appendix.....	48

## **Abstract**

This dissertation examines the intersection of swimming and social exclusion. I utilised human ecological and anthropological perspectives to examine three areas: the importance of swimming for health and community building; the role of historical contexts in informing current gendered and racialised exclusion from UK swimming spaces; and the ways in which experiences within, and exclusion from, swimming spaces can become embodied. This highlighted the potential for swimming to be inclusive of a wide range of individuals for whom other forms of physical activity may introduce barriers, and that swimming has the capacity to mitigate health inequalities experienced by ethnic minorities and the LGBTQ+ community. However, it was also found that discriminatory experiences in swimming spaces and legacies of exclusion/trauma may in fact exacerbate such health risks. These insights underpinned the interpretation of interviews with representatives/members (n=4) of swimming clubs/organisations involved in improving inclusivity and a spatial analysis of the geographical and demographic barriers to accessing swimming pools in Greater Manchester. Through combining qualitative and quantitative methods, I sought to understand the importance of tackling exclusion from swimming spaces in order to achieve what is perceived to be social justice. In doing so, I found evidence to support the health and community benefits of swimming, the potential for discrimination within and exclusion from swimming spaces to become embodied, as well as the importance of the provision of accessible swimming spaces. With regard to the latter, it was found that pool provision in the Greater Manchester area is not currently a key exclusionary factor. In summary, striving for equal access to swimming opportunities, via dismantling historical legacies of exclusion, forging safe spaces, and ensuring the provision of accessible swimming pools, is necessary for health and social justice.

## 1.0 Introduction

Social exclusion refers to processes by which groups are discriminated against due to various characteristics (such as ethnicity, religion, sexual orientation, gender, or disability), resulting in systemic disadvantage (Khan *et al.*, 2015). Exclusion from swimming spaces can result in individuals being denied access to safety, health, and community benefits. On a global scale, drowning is the third highest cause of death from unintentional injury, with approximately 236,000 individuals drowning each year (WHO, 2021). Drowning disproportionately affects individuals of lower socioeconomic status and ethnic minorities, although this varies between countries (WHO, 2021). Notably, the securitisation of EU and UK borders has contributed to an increasing dependence by migrants (in particular, those racialised as Black or Brown) on ‘illegitimate’ and risky maritime passages (De Genova, 2018). Within the UK, when Shukri Abdi (a 12-year-old Muslim refugee) drowned in the River Irwell in Bury in 2019, legal action was later taken against the Greater Manchester police, on the grounds of inadequate investigation and institutionalised racism (Taylor, 2021). Recognition of the importance of water safety underpins the requirement within England’s national curriculum that all primary schools provide swimming lessons (Department of Education, 2013). However, prior to the Covid-19 pandemic, a quarter of children left primary school unable to swim 25m and disruptions to swimming lesson provision during the pandemic have exacerbated these shortcomings; the effects have not been uniform across socioeconomic status, with predictions that in 2026 only 35% of year 7 children in the most deprived areas will be able to swim 1 length, compared to 77% of those in the least deprived areas (Swim England, 2021a). Moreover, barriers exist for ethnic minorities and the LGBTQ+ community. Notably, in England, white British adults (82.3% of the general population) represent 87.0% of the swimming population, whereas Black adults (3.1% of the general population) constitute 1.4%

of the swimming population (Sport England, 2020). In this context, Evans and colleagues (2020) highlighted the importance of considering the pervasiveness of white privilege in sport settings, especially in light of the Black Lives Matter movement. Given that exclusions from swimming spaces can have significant negative implications, the intersection between swimming and social exclusion warrants further attention.

The aim of this multidisciplinary exploration is to provide insights into the complexity of the intersection between swimming and social exclusion. Following a brief introduction to societal exclusion and social justice, I will draw on human ecological and anthropological perspectives to examine previous literature on three areas: the importance of swimming for health and community building; the role of historical contexts in informing current gendered and racialised exclusion from UK swimming spaces; and the potential for experiences of exclusion to become embodied. This will provide necessary contextualisation for the interpretation of interviews with representatives/members of swimming clubs/organisations involved in improving inclusivity and of a spatial analysis of the geographical and demographic barriers to accessing swimming pools in Greater Manchester. Through combining qualitative and quantitative methods, I seek to highlight the necessity of tackling exclusion from swimming spaces for achieving social justice.

Following the Great Recession in 2007, the UK adopted various austerity measures in an attempt to combat the economic ‘crisis’ (Stuckler *et al.*, 2017). This shift to austerity, influenced by the rise of neoliberalism in the 1970s and 1980s, exacerbated class-based and health inequalities (Collins *et al.*, 2015). Since 2008 unemployment and homelessness have risen and public health services have experienced significant spending cuts (Reeves *et al.*, 2013; Stuckler *et al.*, 2017). Moreover, local government budget cuts have negatively impacted

the provision of support services for the LGBTQ+ community (Matthews, 2020). In addition, in 2020, the UK Government's consultation on the 2004 Gender Recognition Act concluded that transgender individuals must continue to provide medical evidence of gender dysphoria and live openly as their preferred gender for at least two years before having their gender legally recognised (Balogun *et al.*, 2022). This demonstrates the persistent pathologising of trans identities (see Stonewall, 2020). Indeed, whilst there has been progress since the beginning of the 21<sup>st</sup> century (for instance, the removal of section 28 of the Local Government Act 1988, which prevented local authorities from 'promoting' homosexuality within schools or published materials, and the introduction of the Equality Act 2010; Matthews, 2020), the LGBTQ+ community continues to face significant discrimination. Similarly, despite claims of an increasingly 'post-racial' society, imperial and colonial histories of racism and oppression continue to shape societal inequalities (Khan, 2020; Alexander and Byrne, 2020); for instance, ethnic minorities are more likely to be of lower socioeconomic status, live in poor housing, and be marginalised by healthcare services, all of which contributed to the disproportionate effect of the Covid-19 pandemic on the UK's Black community (Salway *et al.*, 2020; Razai *et al.*, 2021). The results of the 2016 EU referendum were shaped by nostalgic narratives about the UK's past and the blaming of immigrants for societal conditions, many of which were in fact caused by austerity (Burrell and Hopkins, 2019; King, 2021). In May 2020, the murder of George Floyd in the US sparked international outrage and thousands of protesters in the UK defied Covid-19 lockdown regulations in solidarity (Mohdin *et al.*, 2020; Elliott-Cooper, 2021); this marked a shift in racial discourse within the UK both in public and academic spheres.

Within academic institutions student movements, such as 'Rhodes Must Fall' and 'Why Is My Curriculum White?' (see Moosavi, 2020), have resulted in decolonialisation discourses

becoming increasingly common in the social and human sciences. However, Moosavi (2020) highlighted that the decolonisation trend within Northern Hemisphere universities frequently overlooks the decolonial theories of Southern Hemisphere researchers, thereby perpetuating colonial legacies. Moreover, Tuck and Yang (2012) highlighted that decolonisation must be grounded in the redistribution of land and the undoing of the segregation, criminalisation, and marginalisation of ‘othered’ groups during and since the colonial era. Given these insights, I will instead utilise a social justice framework. Whilst defining ‘social justice’ is associated with challenges (see Merrett, 2004), I will adopt the following definition: “the objective of creating a fair and equal society in which each individual matters, their rights are recognized and protected, and decisions are made in ways that are fair and honest” (Park, 2007). Notably, Fraser (1998) highlighted that achieving social justice necessitates both the redistribution of social resources and the recognition of different identities. With regards to the latter, Smith (2000) noted that drawing attention to differences may undermine the notion of ‘human sameness’, which is foundational to strives for equality. However, it must be recognised that achieving equal access to resources requires certain groups to be prioritised, based on intersecting identity markers and legacies of social exclusion. Moreover, Soja (2010) emphasised the need to consider the spatial dimensions of social justice, and that it can be explored at various geographical scales, from the local to the global. Whilst my analysis is situated in the UK, I recognise the importance of placing academic and activist pursuits within a global context.

## **2.0 Literature Review**

This section explores current literature on the intersection between swimming and social exclusion.

## 2.1 *The Importance of Swimming for Health and Community Building*

Extensive research has been conducted on the relationship between physical activity (defined as “any bodily movement produced by skeletal muscles that requires energy expenditure”; WHO, 2020) and health (Davies *et al.*, 2019). This has revealed that physical activity protects adults from cognitive decline and noncommunicable diseases, such as cardiovascular disease and diabetes (Reiner *et al.*, 2013; Wahid *et al.*, 2016). Physical activity also benefits mental health; for instance, it has been found to improve self-perception and wellbeing among teenagers (Fernández-Bustos *et al.*, 2019). Notably, a report from Swim England’s Swimming and Health Commission (2017) highlighted the importance of swimming for health and wellbeing, the role of swimming in tackling widespread physical inactivity, and the need for further scientific research in this area.

Existing literature is somewhat limited, but identifies various physical health benefits of swimming. With regards to cardiovascular health, a review by Oja and colleagues (2015) found limited evidence of a link between swimming and reduced cardiovascular mortality. However, a more recent study, comparing 70 long-term recreational swimmers and 60 sedentary adults (aged 34-63), reported significantly lower blood pressure among swimmers (Piras *et al.*, 2021), where hypertension is a major risk factor for cardiovascular disease (NHS, 2018). In this context, it is important to consider the length of time required to achieve swimming-associated benefits and whether they persist if someone stops swimming; in this regard, Yuan and colleagues (2016) found that reductions in systolic blood pressure experienced by overweight male volunteers (aged 19–21), following eight weeks of swimming training, did not persist after 4 weeks of detraining. Swimming can also improve respiratory health; for example, a systematic review (involving 1499 participants and studies ranging from 4 weeks to 2 years in



duration) indicated that swimming significantly enhanced peak expiratory flow both for healthy adults and for asthmatics under the age of 18 (Lahart and Metsios, 2018). Interestingly, whilst there is evidence that aquatic exercise benefits fitness and lung function in child asthmatics, the effects on adults with asthma are inconclusive (Beggs *et al.*, 2013; Grande *et al.*, 2014). Moreover, swimming and aquatic exercise have been reported to improve aerobic fitness in pregnant women (Lynch *et al.*, 2007), enhance quality of life for women with multiple sclerosis (MS; Kargarfard *et al.*, 2012), and benefit the gross motor function of children with spastic cerebral palsy (Lai *et al.*, 2015). Whilst these studies demonstrate the potential for swimming to benefit individuals who might experience barriers to other forms of physical activity, they are limited by small sample sizes, the absence of randomised controls and, in some cases, a focus on aquatic exercise rather than swimming. However, a randomised controlled trial, involving 70 women (aged 18-25) diagnosed with pre-menstrual syndrome, revealed that participation in swimming for 3 months resulted in significant reductions in experiences of anxiety, depression, fatigue, and cramps (Maged *et al.*, 2018); this illustrates the combined physical and mental health benefits of swimming.

A number of studies have considered the effects of swimming on mental health and community building. For instance, an 8-week swimming intervention resulted in a significant reduction in depression and stress for children with attention deficit hyperactivity disorder (da Silva *et al.*, 2020). Moreover, provision of an inclusive aquatic programme to children with (n=10) and without (n=16) disabilities, revealed greater acceptance of disabilities following the intervention (Oriol *et al.*, 2012). This illustrates the potential for swimming to foster inclusivity; indeed, Lawson (2005) highlighted that community-based sport initiatives can facilitate social inclusion and develop community networks. That said, the participants with disabilities experienced a significant reduction in happiness score, which warrants further investigation

(Oriol *et al.*, 2012). Consideration of two socioeconomically deprived areas in south Glasgow revealed the importance of swimming pools for socialising and mental health (Thomson *et al.*, 2003). For example, mothers described the pools as places of stress relief and pool closure in one of the areas was reported as having negative implications for safety and reflecting inadequate local investment in the area (Thomson *et al.*, 2003). Notably, one participant commented that “overnight they made it into a ghetto” (Thomson *et al.*, 2003: 664); this use of racialised and emotive language reveals that pool provision influences the way in which places are perceived and illustrates the importance of considering the implications of exclusion from swimming spaces.

## *2.2 Historical and Current Exclusion from Swimming Spaces*

Colonialism had major consequences for the construction of race and gender, as well as legacies of exclusion, and thus it is necessary to reflect on the relationship between colonialism and swimming exclusion. Notably, Dawson (2009; 2018) highlighted the discrepancy in swimming ability between communities of European and African descent during the colonial era, and the implications this had for power acquisition and exploitation. Indeed, observations in Jamaica in 1823 revealed that women utilised their swimming ability to shield themselves from the white male gaze (Dawson, 2018). However, swimming and aquatic proficiency amongst African communities was also used to bolster racist ideology, which contrasted the ‘civility’ of the white, bourgeois, European man with the ‘animalistic’ nature of those racialised as ‘other’ (Anderson, 2000; 2002). Indeed, the crawl used by African populations was deemed less ‘civilised’ than European breaststroke and observations of African people fighting with dangerous aquatic species (such as sharks and crocodiles) were interpreted as “proof of animal-like savagery” (Dawson, 2018: 47). Front crawl is now considered the fastest and most efficient

stroke; however, its origins outside of Europe and its colonies (for instance, with the Wickham brothers from the Solomon Islands being important in introducing crawl, or ‘Tuppa Ta Pala’, to Australia; see Osmond and Phillips, 2006) have largely been erased. Moreover, Europeans capitalised on the aquatic skills of various populations they colonised; for example, Spanish colonisers exploited Native Americans for pearl diving, before relying on West African slaves when the Native American population declined due to infectious diseases and genocide (Dawson, 2009). Violent processes of enslavement and genocide were justified on the basis of white supremacy (i.e., the perceived superiority of those racialised as white), which was at the foundation of colonialism (Bonds and Inwood, 2016). Notably, colonialism and the development of the global capitalist system normalised racialised distinctions and enforced the gender binary at the expense of diverse conceptualisations of gender (Bonds and Inwood, 2016; O’Sullivan, 2021); this has had lasting implications for conceptualisations of race and gender, which in turn have shaped swimming exclusion.

In the UK, the history of swimming is entangled with gendered, classed and racialised exclusion. Indeed, Love (2007a; 2007b; 2007c) highlighted that swimming pools in England were initially privately funded and having a swimming pool became symbolic of the most elite schools, illustrating the intersections between class privilege and swimming. Moreover, concerns about modesty and nudity resulted in women being largely excluded from bathing and swimming (Love, 2007d). However, the Baths and Washhouses Act of 1846 promoted the building of public baths and washhouses, with loans being provided to local authorities to facilitate this endeavour (UK Parliament, 2021); this resulted in a shift from private to public pool provision and enforced the connection between hygiene and swimming (Love, 2007b; McLauchlan, 2017). The latter reflects a broader trend in the 19<sup>th</sup> century, whereby concerns about inadequate sanitation due to rapid urbanisation and industrial growth (facilitated by

British colonial capital production and exploitation) led to the introduction of various public health measures, such as the 1872 Public Health Act (Szreter, 1988; Porter, 1998). Increased swimming pool provision and the emphasis on cleanliness within political and social spheres, contributed to a reduction in gendered and classed exclusion from swimming spaces. Indeed, discourses on the importance of swimming for women's health increased its popularity among women of middle and higher socioeconomic status (Love, 2007d). Moreover, in 1890 the School Board for London enabled schools under their authority to include swimming in their curriculum, due to its recognised benefits for cleanliness and health (Love, 2007e). However, this focus on cleanliness was influenced by discourses on race becoming increasingly pervasive, with emphasis being placed on maintaining a healthy English nation (Love, 2007f). Thus, the reduction in class and gender exclusion can be interpreted, in part, as a symptom of rising eugenics and nationalism. In the US, there was a more marked transition to racial exclusion in the 1920s; indeed, Wiltse (2007: 124) noted that "just as the urban middle class had previously avoided swimming with the working classes, northern whites of all social classes now objected to swimming with blacks, in part, because they feared contracting a communicable disease and becoming contaminated." This demonstrates the importance of considering the ways in which exclusion manifests in different places based on wider societal context.

Swimming spaces continue to be sites of exclusion within the UK. Indeed, swimming pools have been interpreted as sites of social reproduction, whereby the privileges of higher social classes (such as health benefits and social networks) are passed on to younger generations (DeLuca, 2013; DeLuca and Andrews, 2016). Such class-based inequalities can be mitigated via the provision of cost-free swimming sessions, as demonstrated by a Bristol City Council initiative. Here, the level of social deprivation did not affect the uptake of sessions for children

aged 0–15 (Audrey *et al.*, 2012). There was, however, a strong negative relationship between uptake and travel distance, with 70% of swims occurring at the geographically closest pool (Audrey *et al.*, 2012); this demonstrates the importance of swimming pools being spatially accessible. Moreover, ‘A Film Called Blacks Can’t Swim’ (2020) explored swimming experiences within the Black and Asian communities and highlighted the pervasiveness of the stereotype that Black people cannot swim. This stereotype is closely associated with the myth that Black people have higher bone densities than other racialised groups. Although the roots of this myth are uncertain, it is tied to histories of colonialism and race science; notably, it resulted in Black people being perceived as less likely to be injured or experience pain, which was used to justify their exploitation (Schultz, 2019). Notably, Benjamin (2017) highlighted that cultural explanations for observed differences between social groups can reinforce ‘biological’ understandings of race, with the complex societal factors underpinning such differences being ignored. This illustrates the importance of the stereotype that Black people can’t swim not being accepted in public discourses and the need to consider the various factors that inform disparities in participation. Moreover, Caudwell (2020) described that swimming pools and associated changing facilities are frequently viewed as hostile environments for trans and non-binary people, due to the policing of transgender bodies by cis-gendered individuals. This is reflective of wider LGBTQ+ exclusion in sport, where there is evidence for the prevalence of homophobic/transphobic language, discomfort in changing rooms and institutional barriers to trans participation (Hargie *et al.*, 2017; Denison *et al.*, 2021). Trans exclusion is particularly evident in competitive settings; for instance, the Olympics introduced ‘sex testing’ in the 1960s, driven in part by fears of men pretending to be women, resulting in the exclusion of intersex and transgender athletes and the enforcement of the gender binary (Reeser, 2005; el-Malik, 2014; Love, 2014). Therefore, it is critical to consider the continued

legacy of exclusion from swimming spaces and the implications of being denied access to the benefits of swimming.

### *2.3 Embodiment of Exclusion*

Within anthropological discourses, conceptualisations of embodiment and local biologies can aid our understanding of the relationship between health and social exclusion. Indeed, medical anthropologists have considered the ways in which social experiences affect biological processes; notably, Gravlee highlighted that experiences of inequality can have biological and health consequences, and thus we need to consider “how race becomes biology” (2009: 47). Similarly, the notion of local biologies, introduced by Lock and Kaufert (2001), emphasises the ways in which biology is locally constructed within specific social, historical, and political contexts. Drawing attention to biological and epidemiological differences between social groups needs to be framed cautiously, as academic findings can be appropriated to justify discrimination; indeed, the term ‘situated biologies’ was introduced to counter misconceptions about inherent biological differences between social groups (Lock, 2017). In the UK, ethnic minorities and the LGBTQ+ community experience significant health inequalities, as evidenced during the Covid-19 pandemic. For instance, an ecological analysis revealed that a 1% increase in the proportion of a population comprising ethnic minorities was associated with a 5.12% rise in Covid-19-related deaths (Nazroo and Bécares, 2020). Moreover, McGowan and colleagues (2021) reported that LGBTQ+ individuals experienced declining mental health and wellbeing during the Covid-19 pandemic, which may have exacerbated existing health inequalities; the scarcity of research in this area requires immediate attention (see McDermott *et al.*, 2021). In addition, there is growing evidence of the health consequences of experiences of racialised and gendered exclusion. For example, consideration of 51 Black women and 50

white women in Alameda County, California, revealed that the Black women were more likely to internalise their responses to unfair treatment and this response was associated with a greater risk of high blood pressure (Kreieger, 1990). More recently, a systematic review found a significant association between perceived discrimination and hypertension; this association was stronger within certain sub-populations, including the Black community (Dolezsar *et al.*, 2014). Notably, the consideration of ‘perceived’ discrimination in this study undermines the experiences of individuals and its use in future research needs to be evaluated critically. Whilst some research has been conducted in the UK (for instance, providing evidence that racism contributes to the experiences of life-limiting, long-term illness among certain ethnic minorities; Bécares *et al.*, 2009), there has been a US-bias and, given the different historical and social context of the UK, this research needs to be expanded.

It is important to consider the ways in which exclusion from or access to swimming spaces can be embodied. As previously indicated, swimming is associated with various health benefits, including improved cardiovascular health and, thus, may have the potential to mitigate the negative health implications of exposure to stress and exclusion. Moreover, Swim England (2017b) highlighted that swimming can benefit the mental health of transgender individuals by helping to reduce stress. That said, swimming spaces themselves can be sites of discrimination and stress and thus may exacerbate, rather than mitigate, health inequalities. Notably, Caudwell (2020) highlighted that feelings of gender dysphoria can be embodied and introduce a barrier to the participation of transgender and non-binary individuals in swimming. Moreover, epigenetic research has drawn attention to the negative health consequences of generational trauma (see Dubois and Guaspere, 2020), revealing the necessity of examining histories of exclusion from swimming. For instance, it is important to consider the ways in which the legacy of the transatlantic slave trade shapes current swimming experiences. Indeed, Strang (2004)

highlighted that sensory experiences of water are influenced by people's expectations and by the social, cultural, religious, and political context in which they are submerged. In addition, Evans and Sleaf (2015) noted that, for older adults within the UK, memories of unclean pools can deter people from wanting to swim in the present, illustrating the ways in which the embodiment of past experiences can affect future emotional responses and decision-making. The impact of swimming experiences on psychological processes is further demonstrated by Ward (2017), who described that the regulated nature of swimming pools, and the repetitiveness of lane swimming, can enable swimmers to switch off from their surroundings and organise their thoughts. This is compounded by the close adherence of swimmers to social rules and norms; for instance, swimmers try to avoid infringing on the personal space of others, which is deemed especially important due to minimal clothing and the need to 'desexualise' interactions (Scott, 2009). Interestingly, Scott (2009: 127) highlighted that swimmers "internalise the lifeguards' gaze" and play a crucial role in the enactment of discipline and surveillance of themselves and others. This is reflective of Foucault's (1980 [1975]; 1991 [1975]) insights into the shifting nature of control in 18<sup>th</sup> and early 19<sup>th</sup> century Europe, from the top-down imposition of torture and penalty to the surveillance and self-monitoring of 'docile' bodies. Moreover, the swimming pool is recognised as a site for exercise, and thus faster swimmers who embody the purpose of the pool are respected; however, given the public nature of swimming pools, even the most competent swimmers are expected not to take up too much space (Scott, 2009). Therefore, it is evident that swimming pools operate as a social space, in which swimmers are expected to follow various rules and their experiences are embodied.



## 2.4 Summary

Existing literature is indicative of the health and community benefits of swimming, and the potential for swimming to be inclusive for individuals for whom physical activity is associated with additional barriers. However, there is a long history of classed, gendered and racialised exclusion from swimming spaces in the UK, where barriers to participation persist. There is evidence that swimming has the potential to mitigate the negative health consequences of social exclusion experienced by ethnic minorities and the LGBTQ+ community, whilst encountering discrimination within swimming spaces may exacerbate existing health inequalities. Further research into the health consequences of exclusion from swimming spaces is crucial.

## 3.0 Methods

The methods used in this study were approved by the School of Anthropology and Museum Ethnography Research Ethics Committee.

### 3.1 Study Area

Greater Manchester was chosen as the focus for my research, due to its complex social and swimming history, and my personal relationship to the area. Notably, Manchester underwent rapid industrialisation at the beginning of the 19<sup>th</sup> century. By 1835, Manchester and its surrounding areas were responsible for 90% of cotton industrial processes in Britain, facilitated by the transatlantic slave trade and migrant labour (Douglas *et al.*, 2002; Dodge, 2020). The adoption of the Baths and Washhouses Act by the Manchester City Council in 1877, and the resulting commitment to provide swimming facilities, meant that by 1918 Manchester had

more swimming pools than any other English city (excluding the combined London boroughs; Love, 2007g; Steele, 2020). Indeed, reduced entry prices to Leaf Street Baths in Hulme in 1878, for boys aged 12 and below, preceded the provision of swimming lessons by the School Board of London (Love, 2007g). This reflects the importance of community initiatives and civic pride within Manchester's history. Following World War 2, the demand for labour led to increased migration from the British colonies and by the mid-1960s Manchester had the third largest Black population in the UK (Brown and Cunningham, 2016; Shahraz, 2020). However, various instances reveal strained racial relations within Greater Manchester's history; for example, slum clearances in the 1960s and 1970s targeted ethnic minorities and prompted the 'flight' of white residents from areas perceived as 'ghettos' (Brown and Cunningham, 2016). More recently, the murder of Mark Duggan in London in August 2011 by police led to widespread uprisings including in Salford and Manchester; this reflected resistance to racist policing, as well as widening inequalities fuelled by rising austerity (Wain and Joyce, 2012; Butler, 2020; Elliott-Cooper, 2021). In 2011, the Greater Manchester Combined Authority (GMCA) was formed, reflecting a unique history of collaboration and shared identity (Lowndes and Gardner, 2016); although, as noted by Butler and Dobraszczyk (2020), working collectively has posed challenges and imbalances of power exist within the GMCA.

### *3.2 Interviews*

Four semi-structured interviews were conducted with representatives/members of swimming clubs/organisations involved in improving inclusivity. The aim was not to achieve a representative sample, but rather to gain insights into the experiences of a small select group. Three participants were recruited via direct email correspondence; the fourth participant was recruited via the Facebook page of their swimming club. All participants gave written consent

prior to their interviews, which were conducted online between February 3<sup>rd</sup> and March 1<sup>st</sup> 2022 using Microsoft Teams and lasted between 49 and 63 minutes. The interviews were structured around three themes: the participant's relationship to swimming and its importance; exclusion and barriers to swimming; and tackling exclusion and improving inclusivity. Following each interview, detailed notes were produced from the audio recording. All data from the participants were securely stored according to the University of Oxford's protocol. The risk to participants was deemed low; however, it was recognised that discussions about exclusion might cause distress and participants were advised that they didn't have to answer any questions that made them feel uncomfortable. In addition, participants are not directly identifiable within this research, but have been assigned a unique participant number. In conducting the interviews, I was acutely aware of my positionality; I have swum since around the age of 6 months and, in general, as a straight-passing, white cis-gendered woman from a middle-class family I have been able to navigate swimming spaces with immense ease and privilege.

### *3.3 Spatial Analysis*

A spatial analysis was conducted to determine geographical and demographic barriers to accessing swimming pools in Greater Manchester. A Geographic Information System (GIS) enables the creation, management, analysis, and presentation of spatial data (see Chang, 2019). QGIS 3.22 software was used to consider the spatial relationship between swimming pool location and four demographic indicators: ethnicity (measured as the percentage of the population that is white English, Welsh, Scottish, Northern Irish or British); general health (measured as the percentage of the population with self-reported bad health and the percentage of the population with self-reported very good health); economic activity (measured as the

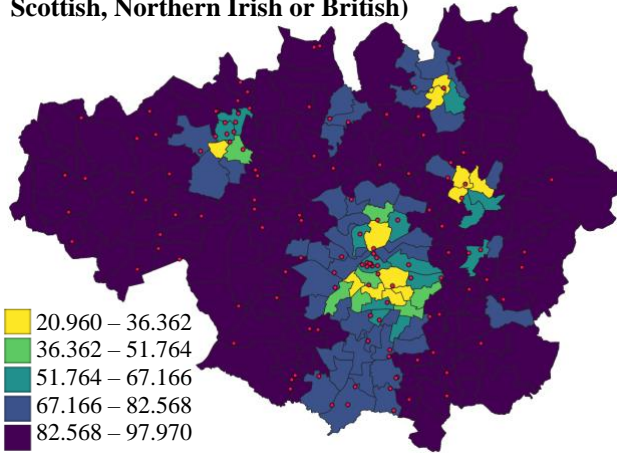
percentage of the population that is economically inactive); and education (measured as the percentage of the population with no qualifications). Ward boundaries for England and Wales were obtained from the Office of National Statistics (2011) in the form of a shapefile (i.e., geospatial vector data). Demographic data, at ward level, were acquired from DataShine (O'Brien and Cheshire, 2016), which provides mapped data from the 2011 Census. The demographic data for each indicator were joined individually to the Greater Manchester ward boundaries using the 'join attributes' function. Wards were categorised into five classes for each demographic indicator, corresponding to equal quintiles between the lowest and highest percentage value (see Table 1). A list of all public swimming pools in England, as of December 2021, along with their postcodes, was provided by Swim England; this identified 183 pools (within 126 facilities) in Greater Manchester. The specific coordinates of each facility were established using Google maps and a shapefile was created containing this information. Maps depicting the aforementioned data are presented in Figure 1 (panels a–e).

**Table 1** *Classification of Demographic Indicators*

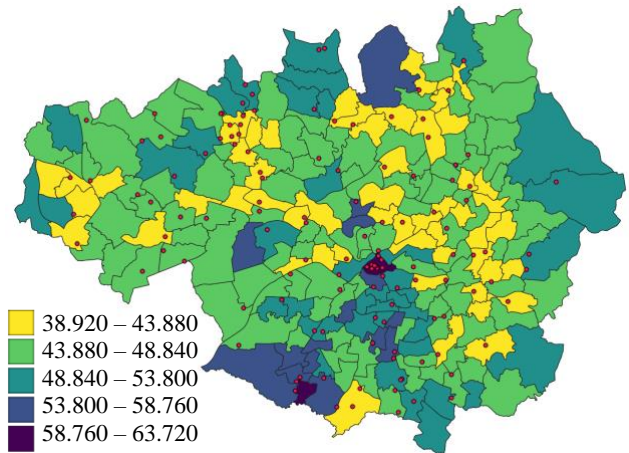
	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>
<b>Ethnicity</b> (% white English, Welsh, Scottish, Northern Irish or British)	20.960 – 36.362	36.362 – 51.764	51.764 – 67.166	67.166 – 82.568	82.568 – 97.970
<b>Very Good Health</b> (% self-reported)	38.920 – 43.880	43.880 – 48.840	48.840 – 53.800	53.800 – 58.760	58.760 – 63.720
<b>Bad Health</b> (% self-reported)	1.010 – 2.632	2.632 – 4.254	4.254 – 5.876	5.876 – 7.498	7.498 – 9.120
<b>Employment</b> (% economically inactive)	19.660 – 25.996	25.996 – 32.332	32.332 – 38.668	38.668 – 45.004	45.004 – 51.340
<b>Education</b> (% no qualifications)	2.850 – 10.814	10.814 – 18.778	18.778 – 26.742	26.742 – 34.706	34.706 – 42.670

Data analyses were carried out using QGIS, GraphPad Prism (v9) and Microsoft Excel. Firstly, Pearson's correlations ( $r$ ), and their statistical significance, were determined for each pair of demographic indicators. Then the number of pools per ward was calculated using the 'count points in polygon' function in QGIS. To account for pools just outside ward boundaries, a 1km

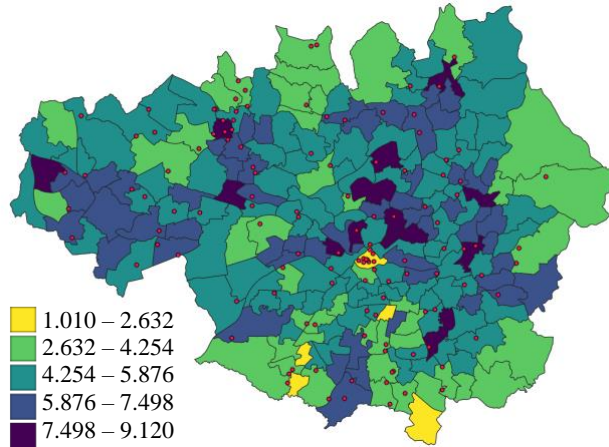
(a) Ethnicity (% white English, Welsh, Scottish, Northern Irish or British)



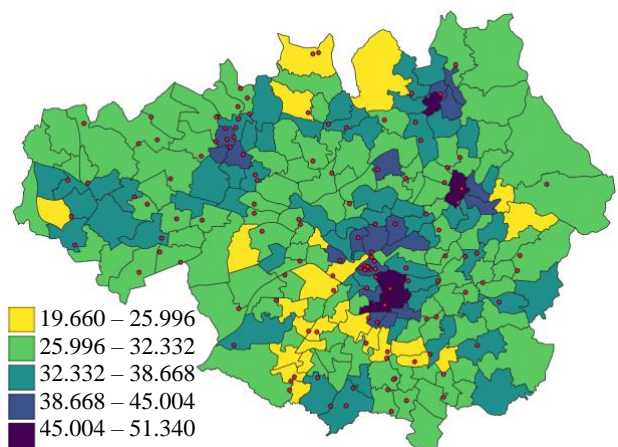
(b) Very Good Health (% self-reported)



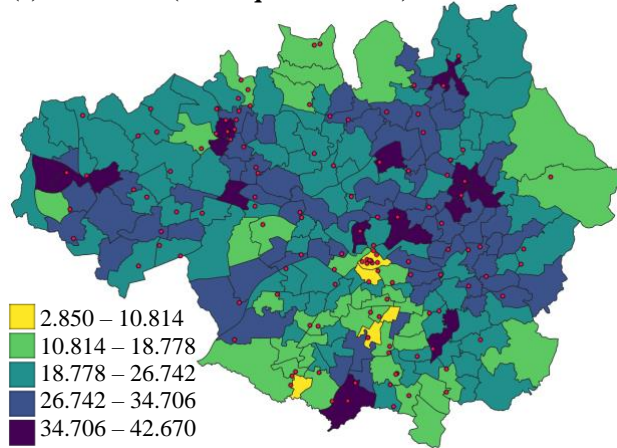
(c) Bad Health (% self-reported)



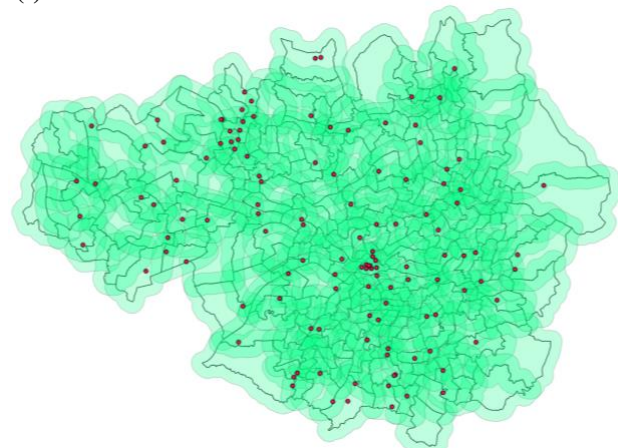
(d) Employment (% economically inactive)



(e) Education (% no qualifications)



(f) 1km Ward Buffer



**Figure 1** QGIS Maps of Greater Manchester Wards and Public Swimming Pools

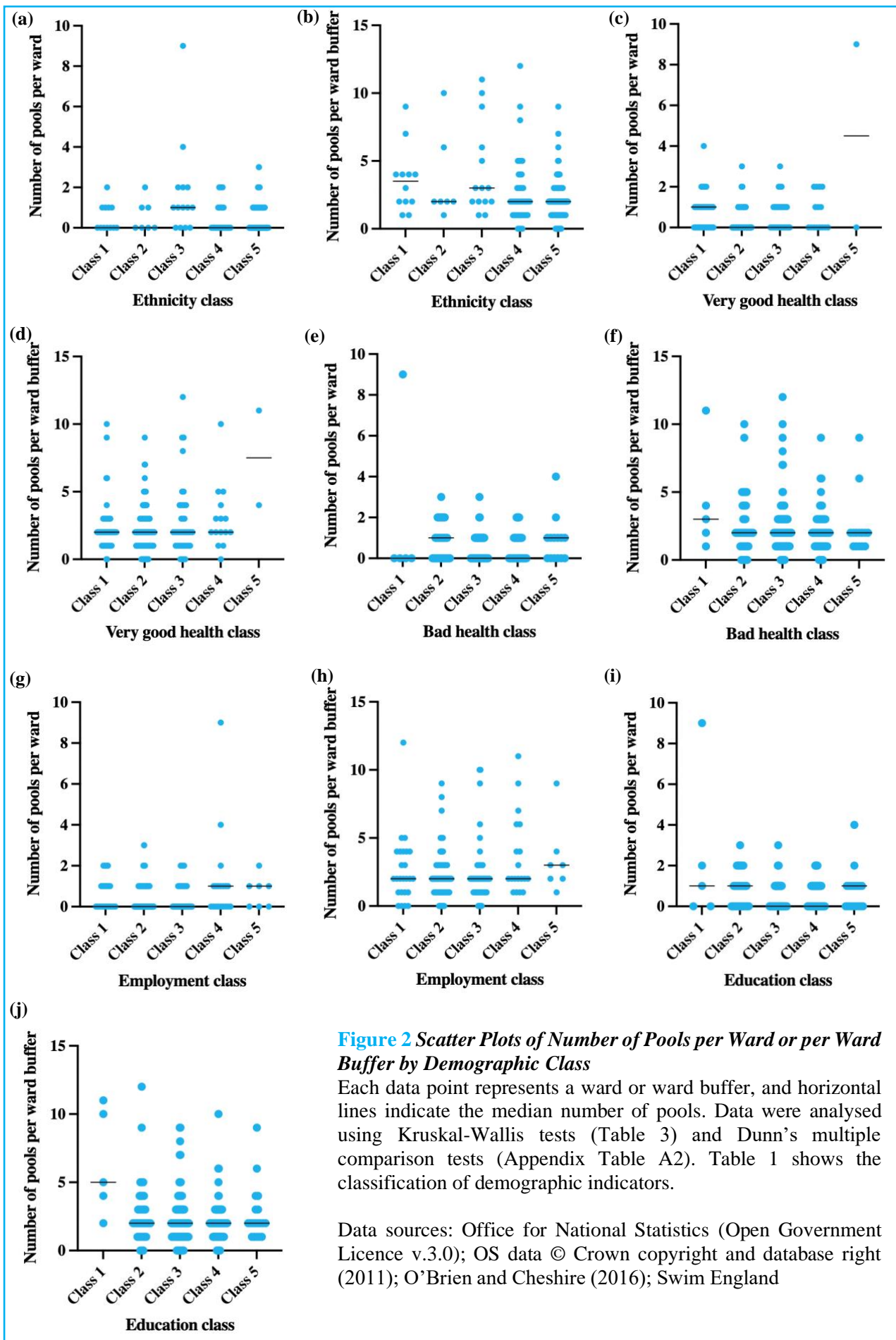
(a)–(e) depict mapped data for demographic indicators; wards are categorised into five classes for each indicator, corresponding to equal quintiles between the lowest (class 1) and highest (class 5) percentage value (see Table 1). (f) shows wards with a 1km buffer; black lines indicate ward boundaries with the buffers in light green. In all panels, pool locations are indicated by red dots.

Data sources: Office for National Statistics (under the Open Government Licence v.3.0); OS data © Crown copyright and database right (2011); O'Brien and Cheshire (2016); Swim England

buffer was created around each ward using the ‘buffer’ function (Figure 1, panel f) and the number of pools per ward buffer was calculated. The distribution of pools is shown in Figure 2. A D’Agostino and Pearson test showed that data were not normally distributed ( $p < 0.0001$ ); therefore, Kruskal-Wallis tests were conducted at the ward and ward buffer level to determine the presence of significant differences ( $p < 0.05$ ) between the median number of pools within any of the classes of each demographic indicator. Dunn’s multiple comparison tests were then used to establish significant differences between specific classes. The city centre contained a higher number of pools ( $n = 9$ ) than any other ward; thus, each Kruskal-Wallis test and Dunn’s multiple comparison test was repeated following the exclusion of the city centre to prevent the skewing of outcomes. The city centre was not excluded from ward buffer analyses, since the pool numbers per ward buffer were more evenly distributed (see Figure 2). Both Kruskal-Wallis tests and Dunn’s multiple comparisons tests utilise mean ranks, which account for the extent to which the number of pools differs between classes. The means ranks and the p values for the Dunn’s multiple comparison tests are presented in the appendix (see Tables A1 and A2, respectively).

The ward-based analyses wrongly assume that each pool is accessible to everyone within the ward in which it is located; therefore, a pool-centred analysis was conducted. Dissolved 1km and 2.5km buffers were formed around each pool location (see Figure 3, panels a and c). The areas of these buffers that overlapped with each class of each demographic indicator were calculated in QGIS using the ‘intersection’ and ‘add geometry attributes’ functions; then, the proportion of the buffers attributed to each class was compared to the proportion of the whole Greater Manchester area attributed to this class using Microsoft Excel, in order to establish if certain demographic characteristics were under- or over-represented within the pool buffer.



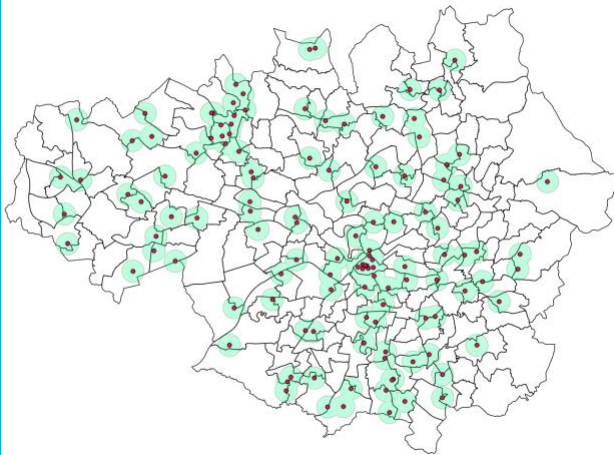


**Figure 2** Scatter Plots of Number of Pools per Ward or per Ward Buffer by Demographic Class

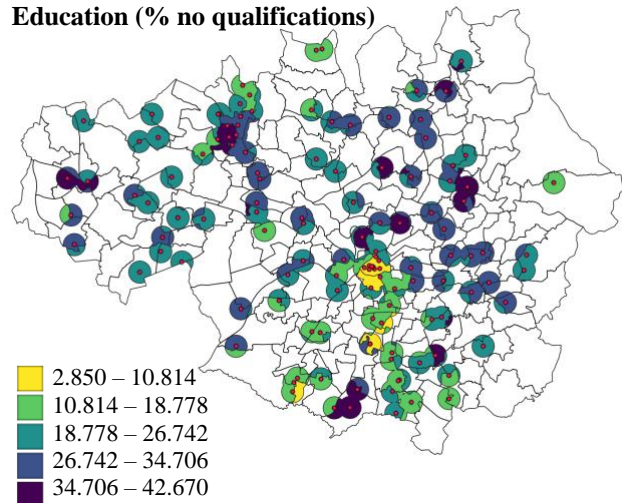
Each data point represents a ward or ward buffer, and horizontal lines indicate the median number of pools. Data were analysed using Kruskal-Wallis tests (Table 3) and Dunn’s multiple comparison tests (Appendix Table A2). Table 1 shows the classification of demographic indicators.

Data sources: Office for National Statistics (Open Government Licence v.3.0); OS data © Crown copyright and database right (2011); O’Brien and Cheshire (2016); Swim England

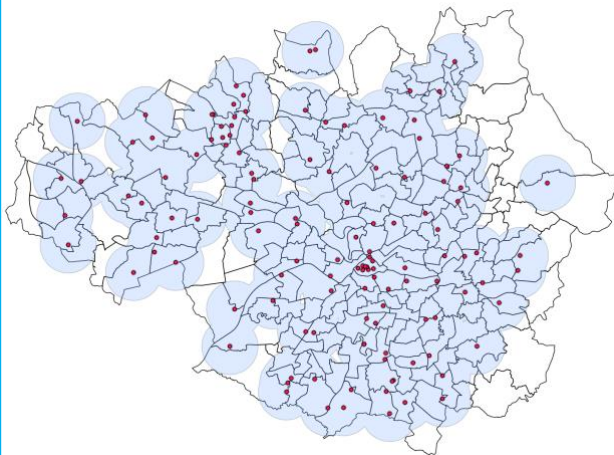
**(a) 1km Dissolved Pool Buffer**



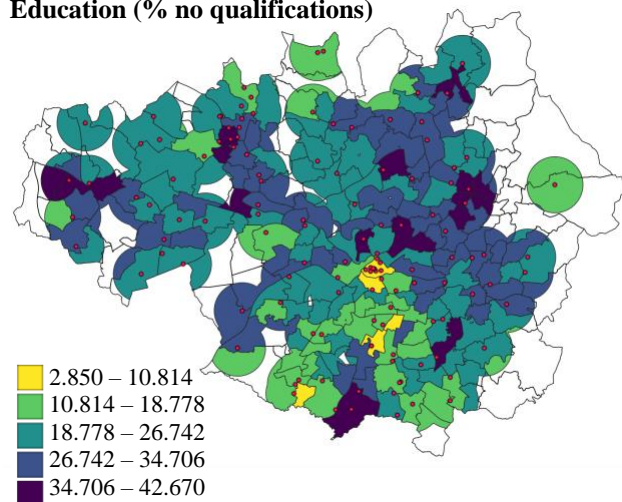
**(b) Intersection of 1km Buffer and Education (% no qualifications)**



**(c) 2.5km Dissolved Pool Buffer**



**(d) Intersection of 2.5km Buffer and Education (% no qualifications)**



**Figure 3 QGIS Maps of Pool Buffers and Their Intersections with Ward Education Classes**

(a) and (c) show 1km and 2.5km dissolved buffers around pools in Greater Manchester. (b) and (d) show the intersections between the education classifications of wards and the 1km and 2.5km dissolved pool buffers, respectively. See Appendix (Figure A1) for intersections with other demographic indicators.

Data sources: Office for National Statistics (under Open Government Licence v.3.0); OS data © Crown copyright and database right (2011); O'Brien and Cheshire (2016); Swim England

### 3.4 Methodological Limitations

The methodology described has various limitations. Whilst the small number of interviewees was intentional and the individuals reflect a range of identities (in terms of gender, sexuality, and race), it is important to emphasise that the participants should not be perceived as



spokespeople for others who share their identity. That said, due to their roles within organisations, some of the participants were well positioned to reflect on broader patterns of exclusion.

The most significant limitation of the spatial analysis is the temporal discrepancy between the 2011 census data and the 2021 pool data; 2021 census data were not yet published at the time of research. This is justified, as the 2011 census was the most comprehensive data set available for the demographic indicators utilised; however, the results must be interpreted with caution. Exploration of temporal changes in the relationships between demographic indicators and pool availability represents an important avenue for future research, especially in light of Swim England's (2021a) prediction that almost 2,000 pools may close by 2030. In addition, the use of data at ward level obscures variations within wards, and the demographic indicators themselves also conceal differences. For instance, the measurement for ethnicity conflates white minority groups with other ethnic minorities; this ignores the reality that, whilst white minority groups may experience various forms of societal exclusion, individuals in this category are unlikely to encounter the same barriers to swimming participation. This analysis doesn't consider population density, transport availability, pool usage and pool cost, all of which would greatly enrich future analyses, as would extending the study beyond Greater Manchester.

#### **4.0 Interview Results and Discussion**

Semi-structured interviews were conducted with 4 participants. Participant 1 is the co-chair at Northern Wave: an LGBTQ+ swimming club in Manchester. Participant 2 is the Inclusion & Health and Safety Partner at Swim England: the governing body for swimming in England.

Participant 3 is a swimmer at Northern Wave. Participant 4 is the producer of three film-documentaries (including ‘A Film Called Blacks Can’t Swim’) and co-founder of the Black Swimming Association: a national organisation aimed at tackling the barriers that African, Caribbean, and Asian communities face in accessing swimming and aquatic spaces.

#### *4.1 Relationship to Swimming and its Importance*

All participants highlighted the importance of swimming for safety, health and community building. Indeed, participant 2 emphasised that swimming is fundamentally a life skill and noted that he was taught to swim by his parents, who recognised the importance of learning to swim for safety. This contrasts to participant 4’s experience at age 10 of being told he couldn’t learn to swim; his mother didn’t view swimming as a priority and interpreted water safety as staying away from the water. Participant 4 began learning to swim in 2018 out of a desire to be able to help his daughter if she ever came into difficulty in the water. These experiences emphasise the role of intergenerational transmission in influencing access to swimming and the perception of swimming as a life skill. With regards to health, participant 1 attributed his physical fitness largely to the fact he has swum relatively constantly throughout his life; however, in general, the participants placed more emphasis on the mental health benefits of swimming, which mirrors the findings of Thomson and colleagues (2003). For instance, participant 3 emphasised that she has come to view swimming as a form of meditation and values the tranquil and sensory experience. In addition, she recalled that a neck and shoulder injury at age 14 prevented her participation in competitive swimming and other forms of physical activity, and that her mental health suffered as a result. For participant 1, one of the reasons he restarted swimming at university was to meet people in a wholesome environment, which reflects the perception that swimming benefits mental health and community building.

With regards to the latter, participant 2 highlighted that swimming sessions, such as Swim England's (2017b) Dementia Friendly Swimming, bring people together based on shared experiences, and his remarks depicted swimming pools as inherently social spaces. However, participants 1 and 3 noted that swimming is not necessarily intertwined with the formation of community networks. Indeed, participant 1 emphasised that it is more likely that an individual will encounter the same people regularly in a club environment; however, he noted the potential for community building to occur in public sessions, remarking "it's probably a Manchester thing... definitely a community can build". This alludes to the significance of community within Greater Manchester and illustrates the importance of considering the role of place, as illustrated in the context of local/situated biologies.

#### *4.2 Exclusion and Barriers to Participation*

The participants discussed various barriers to participation. Participant 4 highlighted social barriers faced by Black and Asian communities, including swimming not being deemed a priority, distrust of the swimming sector (for instance, due to the lack of representation in governing positions) and generational transmission of the stereotype that Black people can't swim. Regarding the roots of this stereotype, participant 4 commented that there are unverified reports that, during the transatlantic slave trade, slaves would be thrown overboard to enable slave owners to claim insurance; this fostered a fear of water within diasporic African communities, demonstrating the embodiment of legacies of trauma (see Dubois and Guaspere, 2020). Participant 1 noted the lack of ethnic diversity within Northern Wave, which he viewed as part of a broader issue within the elite/athletic sphere of swimming. This needs to be addressed, especially in light of the seemingly pronounced community and social benefits of swimming clubs. Participant 2 highlighted the importance of improving disabled access;

however, he recognised the challenges of introducing a mixed-ability framework (whereby disabled and non-disabled individuals participate in sport together) to swimming, due to the emphasis on performance. He noted that the latter fosters a daunting environment, which would make him feel anxious about joining a swimming club, despite his outgoing personality. Participants 1 and 3 also expressed anxiety about joining a club in adulthood; for participant 1, this stemmed from previous experiences of homophobia in swimming settings, and he highlighted the importance of Northern Wave for enabling him to return to swimming. Interestingly, he mentioned that he initially assumed an LGBTQ+ swimming club wouldn't be of as high calibre, due to internalising rhetoric he had been exposed to growing up. These experiences support the findings of Evans and Sleaf (2015) that negative incidents can become embodied and shape future decisions. In addition, participant 1 and 2 highlighted the barriers that changing rooms can introduce for trans individuals, reflecting Caudwell's (2020) previous findings. Participant 3 noted that some swimmers lack awareness of personal space and stand very close to others in the pool; this demonstrates that failure to follow the social norms outlined by Scott (2009) can be a source of discomfort.

#### *4.3 Tackling Exclusion and Building an Inclusive Future*

The participants perceived an inclusive swimming space as being one that is welcoming and provides different sessions to cater for varying needs. For example, participant 1 noted that Northern Wave doesn't exclude individuals who are not part of the LGBTQ+ community, remarking "we say what we are, but absolutely everybody is welcome". In addition, he highlighted that providing a womxn session has increased the club's popularity. Participant 3 valued this session, due to previous negative experiences; for example, she recalled being made to feel body-conscious and on high alert, due to looks and comments made by men, and

commented that this is particularly problematic in the context of swimming due to the nature of swimwear. Notably, all of the interviewees demonstrated either resistance to exclusion or active attempts to improve inclusivity. Indeed participant 3 said that she self-manages her exposure to the male gaze by picking an emptier lane when attending mixed sessions, even if the lane does not correlate with her speed. Moreover, participant 4 is promoting conversations and dismantling the stereotype that Black people can't swim, as well working with Swim England to enact structural change. Participant 2 drew attention to various on-going Swim England initiatives; for instance, the 'Peers on the Poolside' project is providing funding for Black and Asian individuals to train as swimming teachers and a new trans competition policy is being formulated. The latter is important given the institutional barriers to trans participation (Denison *et al.*, 2021); however, the policy details have yet to be established, and its role in dismantling or reinforcing the medicalisation of trans identities will require future analysis.

Striving to improve inclusivity is not without its challenges and conflicts. Notably, participant 1 highlighted the political tensions that exist within Northern Wave regarding the womxn session; indeed, some members didn't understand why it was necessary to provide a women-only space within an LGBTQ+ club. In addition, whilst participant 2 noted that Swim England recommends the introduction of changing villages in newly built or refurbished pools, participant 3 highlighted that she would prefer to have some changing facilities that are only available to women and children or for improvements to be made to cubicle design. This was influenced by vivid memories of men leaning over or peeping under changing rooms when she went swimming as a child; in fact, she noted that she continues to check if anyone is in the neighbouring cubicle, reiterating the potential for negative memories to be embodied. Participant 1 questioned whether Swim England's inclusivity standards are sufficient, whereas participant 2 highlighted the potential challenges of introducing certain changes (such as

shifting the focus away from performance), due to clubs questioning whether resources could be better spent. Notably, the possibility of an inclusive future is jeopardised by pool closures. When asked about Swim England's (2021a) prediction about forthcoming pool closures, all participants expressed concern. Indeed, participants 2 and 4 highlighted that this may disproportionately affect ethnic minorities (due to the presence of older pools in areas of higher ethnic diversity and lower usage), which in turn would significantly hinder attempts to improve access. In addition, participant 1 raised concerns about accessing pool time for clubs; pool closures would likely exacerbate an existing challenge, where attempts by Northern Wave to contact new pools are often met with no response, potentially due to their status as an LGBTQ+ swimming club. All participants emphasised the importance of pools (and their associated benefits) being easily and locally accessible.

#### *4.4 Summary*

The interviews conducted highlighted the importance of swimming for safety, health and community building, and that certain groups experience barriers to accessing swimming spaces. Notably, various attempts are being made to mitigate exclusion; however, this is not without significant challenges.

### **5.0 Spatial Analysis Results and Discussion**

A spatial analysis of the geographical and demographic barriers to swimming pools in Greater Manchester was conducted; this is justified by the importance of pools being locally accessible, as demonstrated in section 4.

### *5.1 Correlations Between the Demographic Indicators*

Pearson's correlation coefficients ( $r$ ) and their significance were determined for each pair of demographic indicators and the results are presented in Table 2. Ethnicity was found to have a significant moderate negative correlation with employment, illustrating that wards with a larger white population have a lower proportion of economically inactive individuals. Interestingly, at the ward level, correlations between ethnicity and health (both very good and bad health) are weak and not significant, which is not reflective of the health inequalities outlined previously. This may be due to analysis being conducted at ward level and all ethnic minorities being grouped together. Very good health exhibited a significant strong negative correlation with bad health. Notably, if a ward has a low percentage of individuals with very good health, it doesn't necessarily mean that health is poor, but rather could reflect a high proportion of the population having good or fair health. Thus, this strong negative correlation provides useful insight, and demonstrates that either indicator can be used as a proxy for general health. Moreover, education had significant strong correlations with both health indicators. These associations reveal that wards with a higher proportion of individuals with no qualifications have poorer health, reflecting class-based health inequalities. In addition, education had a significant moderate positive correlation with employment and employment exhibited a significant moderate positive correlation with bad health. Given that education and employment can both be used as class indicators, the discrepancy in the strength of the relationship between each of these indicators and health is notable.

**Table 2** *Pearson's Correlation Analyses Between Demographic Indicators*

	<b>Ethnicity</b>	<b>Very Good Health</b>	<b>Bad Health</b>	<b>Employment</b>	<b>Education</b>
<b>Ethnicity</b>	-	-0.031 <sup>€</sup> (0.647) <sup>#</sup>	-0.131 (0.056)	-0.659 (<0.0001)	-0.147 (0.031)
<b>Very Good Health</b>	-0.031 (0.647)	-	-0.865 (<0.0001)	-0.370 (<0.0001)	-0.881 (<0.0001)
<b>Bad Health</b>	-0.131 (0.056)	-0.865 (<0.0001)	-	0.508 (<0.0001)	0.922 (<0.0001)
<b>Employment</b>	-0.659 (<0.0001)	-0.370 (<0.0001)	0.508 (<0.0001)	-	0.509 (<0.0001)
<b>Education</b>	-0.147 (0.031)	-0.881 (<0.0001)	0.922 (<0.0001)	0.509 (<0.0001)	-

<sup>€</sup> correlation coefficient (r)

<sup>#</sup> p value

### 5.2 Kruskal-Wallis and Dunn's Multiple Comparison Tests

Kruskal-Wallis and Dunn's multiple comparison tests were conducted for the wards (with and without inclusion of the city centre) and the ward buffers (see Section 3.3). Kruskal-Wallis tests at ward level (Table 3) revealed a significant difference between number of pools and the five classes of very good health. However, the numbers of pools per ward were not significantly different between the five classes for ethnicity, bad health, employment or education. Subsequent Dunn's multiple comparison tests revealed that for very good health, there was a significant difference between class 1 and class 2. Indeed, class 1 had a higher mean rank than class 2 (see Table A1); this indicates that, contrary to what may be expected, wards with the lowest percentage of very good health had greater pool abundance. That said, class 5 had the greatest median (see Figure 2c) and mean rank, which suggests that wards with the highest percentage of very good health had the largest number of pools; however, this was not significant and was likely skewed due to the city centre being one of only two wards in this class. Indeed, the city centre contains a large student population and thus the high proportion of very good health is expected. For ethnicity, class 3 had the highest median (see Figure 2a)



and mean rank, and the Dunn’s test revealed that the mean rank of class 3 was significantly higher than the mean rank of class 4. This may partly reflect the fact that the city centre falls in class 3. Indeed, the absence of significance between all other pairs of classes, suggests that ethnic diversity is not significantly associated with the number of pools available in a given ward. Thus, the underrepresentation of certain ethnic minorities in swimming spaces, as previously discussed, is likely due to other factors (such as stereotyping); to further assess this it is necessary to consider how pool usage varies by ethnicity between and within wards.

**Table 3** *P Values for Kruskal-Wallis Tests*

	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
<b>Ethnicity</b>	0.0788	0.1818	<b>0.0063*</b>
<b>Very Good Health</b>	<b>0.0251*</b>	<b>0.0229*</b>	0.0954
<b>Bad Health</b>	0.1101	<b>0.0393*</b>	0.7127
<b>Employment</b>	0.7274	0.8519	0.1354
<b>Education</b>	0.0608	0.1056	<b>0.0250*</b>

\*  $p < 0.05$

Following exclusion of the city centre, Kruskal-Wallis tests revealed that, at ward level, there remained a significant difference between at least two of the classes for very good health, and a significant difference was also observed for bad health. However, numbers of pools per ward were not found to be significantly different between the five classes of ethnicity, employment or education. Subsequent Dunn’s tests revealed that there continued to be a significant difference between class 1 and class 2 for very good health. With exclusion of the city centre, class 5 (i.e., wards with the highest proportion of self-reported very good health) shifted from having the highest mean rank to the lowest, consistent with a skewing effect of the city centre. For ethnicity, class 3 retained the highest mean rank, following exclusion of the city centre; however, the continued absence of statistical significance supports the suggestion that ethnicity is not associated with the geographical availability of pools. Despite the significant Kruskal-Wallis test, the Dunn’s test did not reveal a significant difference between any pairs of classes

for bad health, which may be due to the adjusted significance level for each pairwise test. Notably, class 1 had the lowest mean rank, which indicates that pools are less available in wards with a lower proportion of individuals with bad health; this is contrary to what may be expected. Future analyses would benefit from exploring whether individuals who access pools have improved health compared to the rest of the ward population, and the role of transport in determining pool accessibility.

Performing Kruskal-Wallis tests for the ward buffers revealed significant differences between the number of pools across the classes of ethnicity and education. However, numbers of pools per ward buffer were not significantly different between the five classes of very good health, bad health or employment. The differences observed between the ward and ward buffer analyses, reveals that the effects of demographic indicators on pool access can either be diluted or enhanced by expanding the region of analysis outside the confines of the ward. A Dunn's multiple comparison test indicated that for ethnicity, class 3 contained a significantly higher number of pools than class 5. This outcome should be interpreted cautiously, given that the majority of the wards on the edges of the Greater Manchester area fall into class 5 (i.e., wards with the largest white population) and thus may be vulnerable to fringe effects; indeed, pools within 1km of Greater Manchester's outer boundary are not captured by the ward buffer analysis. For education, the Dunn's test revealed that there was a significant difference between class 1 and both class 3 and class 4. The mean rank of class 1 was greater than that of all the other classes (although, differences between class 1 and both class 2 and class 5 were not significant); this indicates that there are a higher number of pools within, or in 1km proximity of, class 1 wards (i.e., those with the lowest proportion of individuals with no qualifications). This may indicate an association between education and pool access, which is interesting given the strong association found between education and health; however, this requires further

exploration (perhaps at sub-ward level), especially given the lack of significance at ward level. Moreover, the Dunn's test revealed no significant differences between the classes for either very good health or bad health. Interestingly, for very good health, class 5 had the greatest mean rank (as observed at ward level without exclusion of the city centre); this suggests that there is a greater abundance of pools in, or within 1km of, wards where a higher proportion of the population have self-reported very good health. However, this needs to be treated with caution, given the lack of statistical significance. In addition, for bad health, class 1 had the highest median (see Figure 2f) and mean rank. This differs from the outcome at ward level, where class 1 has the lowest mean rank, and reveals that there must be a higher number of pools just outside the wards with a low proportion of bad health; data on usage patterns would improve our understanding of which pools individuals access and the effects on population health. In addition, this discrepancy between ward and ward buffer outcomes highlights the limitation of conducting analyses at the ward level and the importance of pool-centred analyses.

### *5.3 Intersections Between the Pool Buffers and Demographic Indicators*

The intersections between pool buffers and spatially mapped demographic indicators are presented in Figure 3 (education) and Figure A1 of the Appendix (other indicators); Table A3 (Appendix) shows the proportions of the pool buffers and the whole Greater Manchester area attributed to each class. For ethnicity, classes 1-4 were overrepresented in the 1km pool buffer, whereas class 5 (i.e., wards with the largest white population) was underrepresented; for instance, the proportion of class 1 in the 1km buffer was 2.52 times higher than in the Greater Manchester area and the proportion of class 3 was 5.54 times higher. Interestingly, this pattern persists for the 2.5km pool buffer, but is less marked; this discrepancy reflects the spatial clustering of ethnic diversity. The finding that class 5 ethnicity is underrepresented in close

proximity to pools needs to be interpreted cautiously; for instance, given that ethnicity was found to be positively correlated with employment, individuals in wards containing a higher white population may experience fewer financial barriers to accessing pools and may have the means to travel further. For very good health, class 1 and class 5 were overrepresented in the 1km and 2.5km pool buffers, whereas classes 2-4 were underrepresented; indeed, class 5 (i.e., wards with the greatest proportion of the population with very good health) represented 3.25 times more of the 1km buffer than the Greater Manchester area. However, the fact that class 1 was also overrepresented, and that class 5 includes the city centre, suggests that there is not a clear association between swimming pool availability and population health. For employment, the most notable discrepancy was that the proportions of classes 4 and 5 in the 1km pool buffer were 2.20 and 2.95 times greater, respectively, compared to the combined ward area; this indicates that pool availability may be higher in areas of high economic inactivity. That said, individuals who are economically inactive may experience financial barriers to accessing pools and thus pool availability may not align with pool usage. Moreover, this finding is likely influenced by the high population of students in, and close to, the city centre. For education, class 1 was overrepresented (3.31 times greater) in the 1km pool buffer compared to the combined ward, which supports previous findings at the ward buffer level; however, the extent of this overrepresentation declined in the 2.5km pool buffer. Moreover, for bad health, class 5 was overrepresented in the 1km (1.52 times higher) and 2.5km (1.25 times greater) pool buffers. This indicates that areas with a higher proportion of individuals with self-reported bad health are overrepresented in proximity to pools, which supports the previous findings at the ward level and requires further analysis.

#### *5.4 Summary*

Based on the analyses conducted here, there is limited evidence for demographic and geographical barriers to pools access in Greater Manchester. However, this finding should be viewed cautiously, given the limitations of this study; notably, it is important for future research to consider whether pool usage reflects local demographics, how access to transport (both private and public) varies and the impact of changing demographics since 2011.

### **6.0 Conclusion**

The findings presented here suggest that the intersection between social exclusion and swimming is complex. This multidisciplinary exploration has emphasised the health-promoting effects of swimming and its capacity for facilitating community building, as well as the potential implications of being excluded from such benefits. Human ecological insights revealed the potential for swimming to be beneficial and inclusive for a wide range of individuals, such as pregnant women and people with MS or cerebral palsy, who may experience barriers to other forms of physical activity. However, inclusivity in swimming spaces is far from actualised. Indeed, reference to anthropological and historiographical sources highlights the legacy of classed, racialised and gendered exclusion from swimming spaces in the UK, and the role of colonialism in shaping such exclusion. Of particular note is the role of nationalist sentiments in shaping the emphasis on hygiene and cleanliness within social and political discourses, which contributed to the rise of swimming in 18<sup>th</sup> century England. Ethnic minority and transgender individuals continue to face significant barriers to participation. This is of particular concern given the capacity of swimming to mitigate health inequalities experienced by ethnic minorities and the LGBTQ+ community. For instance, swimming may

offer a means to reduce the risks of hypertension and cardiovascular disease associated with exposure to discrimination and stress; however, the long-term implications of swimming for cardiovascular health requires further research and discriminatory experiences in swimming spaces may in fact exacerbate such health risks. Moreover, memories and emotions associated with swimming spaces can be embodied; indeed, discussions with interviewees revealed that negative experiences affected practices and decision-making later in life. The interviewees placed particular emphasis on the importance of swimming as a life skill and for mental health; whilst they recognised that swimming has the potential to facilitate community building, this wasn't deemed an integral feature of swimming spaces. It was also noted that inclusivity could be improved by diversifying sessions to cater for different requirements, which offers opportunities for future developments. The importance of pools being locally and financially accessible was also highlighted and this informed the examination of the spatial availability of pools in the Greater Manchester area. The results suggest that there are limited demographic and geographical barriers to access, indicating that pool provision is not currently a key exclusionary factor in Greater Manchester. However, this will need to be carefully tracked in the coming years, given predictions of significant pool closures, and requires examination in other parts of the UK. Further analysis will be necessary to better understand the complexity of barriers to participation and to facilitate the introduction of targeted community initiatives in geographical areas where pool provision and/or usage are lacking. In summary, swimming can have important health benefits and provide a source of community; thus, striving for equal access to swimming opportunities, via dismantling historical legacies of exclusion, forging safe spaces, and ensuring the provision of accessible swimming pools, is necessary for health and social justice.

## References:

- A Film Called Blacks Can't Swim (My Journey My Story)* (2020) [Film] Mysterex (Dir.), SpaceDNA Productions
- Alexander, C. and Byrne, B. (2020) 'Introduction' in Byrne, B., Alexander, C., Khan, O., Nazroo, J. and Shanley, W. (Eds.) *Ethnicity and Race in the UK: State of the Nation*, Bristol University Press, pp. 1–13
- Anderson, K. (2000) "The beast within": race, humanity, and animality', *Environment and Planning D: Society and Space*, 18 (3), pp. 301–320
- Anderson, K. (2002) 'The Racialization of Difference: Enlarging the Story Field', *The Professional Geographer*, 54 (1), pp. 25–30
- Audrey, S., Wheeler, B. W., Mills, J. and Ben-Shlomo, Y. (2012) 'Health promotion and the social gradient: the free swimming initiative for children and young people in Bristol', *Public Health*, 126 (11), pp. 976–981
- Balogun, B., Fairbairn, C. and Pyper, D. (2022) *Gender Recognition Act reform: consultation and outcome* [Online] [Accessed 17 March 2022] Available at: <https://commonslibrary.parliament.uk/research-briefings/cbp-9079/>
- Bécares, L., Stafford, M. and Nazroo, J. (2009) 'Fear of Racism, Employment and Expected Organizational Racism: Their Association with Health', *European Journal of Public Health*, 19 (5), pp. 504–510
- Beggs, S., Foong, Y. C., Le, H. C. T., Noor, D., Wood-Baker, R. and Walters, J. A. E. (2013) 'Swimming training for asthma in children and adolescents aged 18 years and under', *Cochrane: Database of Systematic Reviews*, 4, pp. 1–53
- Benjamin, R. (2017) 'Cultura Obscura: Race, Power and "Culture Talk" in the Health Sciences', *American Journal of Law and Medicine*, 43 (2-3), pp. 225–238
- Bonds, A. and Inwood, J. (2016) 'Beyond white privilege: Geographies of white supremacy and settler colonialism', *Progress in Human Geography*, 40 (6), pp. 715–733
- Brown, L. and Cunningham, N. (2016) 'The Inner Geographies of a Migrant Gateway: Mapping the Built Environment and the Dynamics of Caribbean Mobility in Manchester, 1951–2011', *Social Science History*, 40 (1), pp. 93–120
- Burrell, K. and Hopkins, P. (2019) 'Introduction: Brexit, race and migration', *Environment and Planning C: Politics and Space*, 37 (1), pp. 4–7

- Butler, S. (2020) 'Riot' in Dobraszcyk, P. and Butler, S. (Eds.) *Manchester: Something Rich and Strange*, Manchester University Press, pp. 290–293
- Butler, S. and Dobraszcyk, P. (2020) 'Manchester: seeing like a city' in Dobraszcyk, P. and Butler, S. (Eds.) *Manchester: Something Rich and Strange*, Manchester University Press, pp. 1–23
- Caudwell, J. (2020) 'Transgender and Non-binary Swimming in the UK: Indoor Public Pool Spaces and Un/Safety', *Frontiers in Sociology*, 5 (64), pp. 1–12
- Chang, K-T. (2019) 'Geographic information system' in Richardson, D., Castree, N., Goodchild, M. F., Kobayashi, A., Liu, W. and Marston, R. A. (Eds.) *The International Encyclopedia of Geography*, John Wiley and Sons
- Collins, C., McCartney, G. and Garnham, L. (2015) 'Neoliberalism and health inequalities' in Smith, K. E., Bambra, C. and Hill, S. E. (Eds.) *Health Inequalities: Critical Perspectives*, Oxford University Press
- Da Silva, L. A., Doyenart, R., Salvan, P. S., Rodrigues, W., Lopes, J. F., Gomes, K., Thirupathi, A., de Pinho, R. A. and Silveira, P.C. (2020) 'Swimming Training Improves Mental Health Parameters, Cognition and Motor Coordination in Children with Attention Deficit Hyperactivity Disorder', *International Journal of Environmental Health Research*, 30 (5), pp. 584–592
- Davies, S. C., Atherton, F., McBride, M. and Calderwood, C. (2019) *UK Chief Medical Officers' Physical Activity Guidelines* [Online] [Accessed 17 March 2022] Available at: <https://www.gov.uk/government/publications/physical-activity-guidelines-uk-chief-medical-officers-report>
- Dawson, K. (2009) 'Swimming, Surfing and Underwater Diving in Early Modern Atlantic Africa and the African Diaspora' in Ray, C. E. and Rich, J. (Eds.) *Navigating African Maritime History*, Liverpool University Press, pp. 81–116
- Dawson, K. (2018) *Undercurrents of Power: Aquatic Culture in the African Diaspora*, University of Pennsylvania Press
- De Genova, N. (2018) 'The "migrant crisis" as racial crisis: do *Black Lives Matter* in Europe?', *Ethnic and Racial Studies*, 41 (10), pp. 1765–1782
- DeLuca, J. R. (2013) 'Submersed in Social Segregation: The (Re)Production of Social Capital Through Swim Club Membership', *Journal of Sport and Social Issues*, 37 (4), pp. 340–363
- DeLuca, J. R. and Andrews, D. L. (2016) 'Exercising Privilege: The Cyclical Reproduction of Capital through Swim Club Membership', *Sociological Inquiry*, 86 (3), pp. 301–323



Denison, E., Bevan, N. and Jeanes, R. (2021) 'Reviewing evidence of LGBTQ+ discrimination and exclusion in sport', *Sport Management Review*, 24 (3), pp. 389–409

Department of Education (2013) *National curriculum in England: physical education programmes of study* [Online] [Accessed 17 March 2022] Available at: <https://www.gov.uk/government/publications/national-curriculum-in-england-physical-education-programmes-of-study/national-curriculum-in-england-physical-education-programmes-of-study>

Dodge, M. (2020) 'Cotton' in Dobraszcyk, P. and Butler, S. (Eds.) *Manchester: Something Rich and Strange*, Manchester University Press, pp. 112–116

Dolezsar, C. M., McGrath, J. J., Herzig, A. J. M. and Miller, S. B. (2014) 'Perceived Racial Discrimination and Hypertension: A Comprehensive Systematic Review', *Health Psychology*, 33 (1), pp. 20–34

Douglas, I., Hodgson, R. and Lawson, N. (2002) 'Industry, Environment and Health through 200 Years in Manchester', *Ecological Economics*, 41 (2), pp. 235–255

Dubois, M. and Guaspare, C. (2020) 'From cellular memory to the memory of trauma: Social epigenetics and its public circulation', *Social Science Information*, 59 (1), pp.144–183

Elliott-Cooper, A. (2021) *Black Resistance to British Policing*, Manchester University Press

El-Malik, S. S. (2014) 'Rattling the binary: symbolic power, gender, and embodied colonial legacies', *Politics, Groups, and Identities*, 2 (1), pp. 1–16

*Equality Act 2010* (c. 15) [Online] The National Archives [Accessed 17 March 2022] Available at: <https://www.legislation.gov.uk/ukpga/2010/15/contents/enacted>

Evans, A. B. and Sleaf, M. (2015) 'Older adults' lifelong embodied experiences of leisure time aquatic physical activity in the United Kingdom', *Leisure Studies*, 34 (3), pp. 335–353

Evans, A. B., Agergaard, S., Campbell, P. I., Hylton, K. and Lennis, V. (2020) "'Black Lives Matter': sport, race and ethnicity in challenging times', *European Journal for Sport and Society*, 17 (4), pp. 289–300

Fernández-Bustos, J. G., Infantes-Paniagua, Á., Cuevas, R. and Contreras, O. R. (2019) 'Effect of Physical Activity on Self-Concept: Theoretical Model on the Mediation of Body Image and Physical Self-Concept in Adolescents', *Frontiers in Psychology*, 10 (1537), pp. 1–11

Foucault, M. (1980 [1975]) 'Prison Talk' in Gordon, C. (Ed.) *Power/Knowledge: Selected Interviews and Other Writings 1972–1977*, New York: Pantheon Books, pp. 37 – 54

Foucault, M. (1991 [1975]) *Discipline and Punish: The Birth of the Prison*, London: Penguin Books

Fraser, N. (1998) 'Social justice in the age of identity politics: Redistribution, recognition, participation', *WZB Discussion Paper* [Online] [Accessed 17 March 2022] Available at: <http://hdl.handle.net/10419/44061>

Grande, A. J., Silva, V., Andriolo, B. N. G., Riera, R., Parra, S. A. and Peccin, M. S. (2014) 'Water-based exercise for adults with asthma', *Cochrane: Database of Systematic Reviews*, 7, pp. 1–32

Gravlee, C. C. (2009) 'How race become biology: embodiment of social inequality', *American Journal of Physical Anthropology*, 139, pp. 47–57

Hargie, O. D. W., Mitchell, D. H. and Somerville, I. J. A. (2017) '“People have a knack of making you feel excluded if they catch on to your difference”: Transgender experiences of exclusion in sport', *International Review for the Sociology of Sport*, 52 (2), pp. 223–239

Kargarfard, M., Etemadifar, M., Baker, P., Mehrabi, M. and Hayatbakhsh, R. (2012) 'Effect of aquatic exercise training on fatigue and health-related quality of life in patients with multiple sclerosis', *Archives of Physical Medicine and Rehabilitation*, 93, pp. 1701–1708

Khan, O. (2020) 'Conclusion' in Byrne, B., Alexander, C., Khan, O., Nazroo, J. and Shanley, W. (Eds.) *Ethnicity and Race in the UK: State of the Nation*, Bristol University Press, pp. 229–235

Khan, S., Combaz, E. and McAslan Fraser, E. (2015) *Social exclusion: topic guide*, revised edition, Birmingham, UK: GSDRC

King, R. (2021) 'On Europe, immigration and inequality: Brexit as a ‘wicked problem’', *Journal of Immigrant and Refugees Studies*, 19 (1), pp. 25–38

Krieger, N. (1990) 'Racial and Gender Discrimination: Risk Factors for High Blood Pressure?', *Social Science and Medicine*, 30 (12), pp.1273–1281

Lahart, I. M. and Metsios, G. S. (2018) 'Chronic Physiological Effects of Swim Training Interventions in Non-Elite Swimmers: A Systematic Review and Meta-Analysis', *Sports Medicine*, 48, pp. 337–359

Lai, C-J., Liu, W-Y., Yang, T-F., Chen, C-L., Wu, C.-Y. and Chan, R-C. (2015) 'Pediatric aquatic therapy on motor function and enjoyment in children diagnosed with cerebral palsy of various motor severities', *Journal of Child Neurology*, 30, pp. 200–208

Lawson, H. A. (2005) 'Empowering people, facilitating community development, and contributing to sustainable development: The social work of sport, exercise, and physical education programs', *Sport, Education and Society*, 10, pp. 135–160

*Local Government Act 1988* (c. 9) 'Section 28' [Online] The National Archives [Accessed 17 March 2022] Available at: <https://www.legislation.gov.uk/ukpga/1988/9/section/28/enacted>

Lock, M. (2017) 'Recovering the Body', *Annual Review of Anthropology*, 46, pp. 1–14

Lock, M. and Kaufert, P. (2001) 'Menopause, local biologies, and cultures of ageing', *American Journal of Human Biology*, 13 (4), pp. 494–504

Love, A. (2014) 'Transgender exclusion and inclusion in sport' in Hargreaves, J. and Anderson, E. (Eds.) *Routledge Handbook of Sport, Gender and Sexuality*, London: Routledge, pp. 376–383

Love, C. (2007a) 'An overview of the development of swimming in England, c.1750-1918', *The International Journal of the History of Sport*, 24 (5), pp. 568–585

Love, C. (2007b) 'Local aquatic empires: The municipal provision of swimming pools in England, 1828–1918', *The International Journal of the History of Sport*, 24 (5), pp. 620–629

Love, C. (2007c) 'Swimming at the clarendon schools', *The International Journal of the History of Sport*, 24 (5), pp. 643–653

Love, C. (2007d) 'Swimming and gender in the Victorian world', *The International Journal of the History of Sport*, 24 (5), pp. 586–602

Love, C. (2007e) 'State schools, swimming and physical training', *The International Journal of the History of Sport*, 24 (5), pp. 654–666

Love, C. (2007f) 'Taking a refreshing dip: Health, cleanliness and the empire', *The International Journal of the History of Sport*, 24 (5), pp. 693–706

Love, C. (2007g) 'Holborn, Lambeth and Manchester: Three Case Studies in Municipal Swimming Pool Provision', *The International Journal of the History of Sport*, 24 (5), pp. 630–642

Lynch, A-M., Goodman, C., Choy, P. L., Dawson, B., Newnham, J. P., McDonald, S. and Blanksby, B. A. (2007) 'Maternal physiological responses to swimming training during the second trimester of pregnancy', *Research in Sports Medicine*, 15, pp. 33–45

- Maged, A. M., Abbassy, A. H., Sakr, H. R. S., Elsawah, H., Wagih, H., Ogila, A. I. and Kotb, A. (2018) 'Effect of Swimming Exercise on Premenstrual Syndrome', *Archives of Gynecology and Obstetrics*, 297 (4), pp. 951–959
- Matthews, P. (2020) 'Debate: LGBTQ rights in public services—a battle won?', *Public Money and Management*, 40 (6), pp. 423–425
- McDermott, E., Nelson, R. and Weeks, H. (2021) 'The Politics of LGBT+ Health Inequality: Conclusions from a UK Scoping Review', *International Journal of Environmental Research and Public Health*, 18 (826), pp. 1–35
- McGowan, V. J., Lowther, H. J. and Meads, C. (2021) 'Life under COVID-19 for LGBT+ people in the UK: systematic review of UK research on the impact of COVID-19 on sexual and gender minority populations', *BMJ Open*, 11, pp. 1–12
- McLauchlan (2017) 'Geographies of swimming pool provision: lessons from Glasgow 1804-2014', *Scottish Geographical Journal*, 133 (2), pp. 83–100
- Merrett, C. D. (2004) 'Social Justice: What Is It? Why Teach It?', *Journal of Geography*, 103 (3), pp. 93–101
- Mohdin, A., Swann, G. and Bannock, C. (2020) 'How George Floyd's death sparked a wave of UK anti-racism protests', *The Guardian* [Online] [Accessed 17 March 2022] Available at: <https://www.theguardian.com/uk-news/2020/jul/29/george-floyd-death-fuelled-anti-racism-protests-britain>
- Moosavi, L. (2020) 'The decolonial bandwagon and the dangers of intellectual decolonisation', *International Review of Sociology*, 30 (2), pp. 332–354
- Nazroo, J. and Bécarea, L. (2020) 'Evidence for ethnic inequalities in mortality related to COVID-19 infections: findings from an ecological analysis of England', *BMJ Open*, 10, pp. 1–6
- NHS (2018) *Cardiovascular disease* [Online] [Accessed 17 March 2022] Available at: <https://www.nhs.uk/conditions/cardiovascular-disease/>
- O'Brien, O. and Cheshire, J. (2016) 'Interactive mapping for large, open demographic data sets using familiar geographical features', *Journal of Maps*, 12 (4), pp. 676–683
- Office for National Statistics (2011) *Census Merged Wards (December 2011) Boundaries* [Online] [Accessed 17 March 2022] Available at: <https://geoportal.statistics.gov.uk/maps/ons::census-merged-wards-december-2011-boundaries/about>

- Oja, P., Titze, S., Kokko, S., Kujala, U. M., Heinonen, A., Kelly, P., Koski, P. and Foster, C., (2015) 'Health benefits of different sport disciplines for adults: systematic review of observational and intervention studies with meta-analysis', *British Journal of Sports Medicine*, 49, pp. 434–440
- Oriel, K. N., Marchese, V. G., Shirk, A., Wagner, L., Young, E. and Miller, L. (2012) 'The psychosocial benefits of an inclusive community-based aquatics program', *Pediatric Physical Therapy*, 24, pp. 361–367
- Osmond, G. and Phillips, M. G. (2006) '“Look at that kid crawling”: Race, myth and the ‘crawl’ stroke', *Australian Historical Studies*, 37 (127), pp. 43–62
- O’Sullivan, S. (2021) 'The Colonial Project of Gender (and Everything Else)', *Genealogy*, 5 (67), pp. 1–9
- Park, C. (2007) *A Dictionary of Environment and Conservation*, 1<sup>st</sup> edition, Oxford University Press
- Piras, A., Cortesi, M., Di Michele, R., Trofè, A. and Raffi, M. (2021) 'Lifetime Exposure to Recreational Swimming Training and Its Effects on Autonomic Responses', *International Journal of Sports Medicine*, 42 (5), pp. 425–431
- Porter, D. (1998) *Health, Civilization and the State: A history of public health from ancient to modern times*, London: Routledge
- Razai, M. S., Kankam, H. K. N., Majeed, A., Edmail, A. and Williams, D. R. (2021) 'Mitigating ethnic disparities in covid-19 and beyond', *BMJ*, 372, pp. 1–5
- Reeser, J. C. (2005) 'Gender identity and sport: is the playing field level?', *British Journal of Sports Medicine*, 39, pp. 695–699
- Reiner, M., Niermann, C., Jekauc, D. and Woll, A. (2013) 'Long- term health benefits of physical activity – a systematic review of longitudinal studies', *BMC Public Health*, 13 (813), pp. 1–9
- Salway, S., Holman, D., Lee, C., McGowan, V., Ben-Shlomo, Y., Saxena, S. and Nazroo, J. (2020) 'Transforming the Health System for the UK’s Multiethnic Population', *BMJ*, 368, pp. 1–4
- Schultz, J. (2019) 'Racialized Osteology and Athletic Aptitude, or "Black" Bones as Red Herrings', *Journal of Sport History*, 46 (3), pp. 325–346
- Shahraz, Q. (2020) 'Immigrant' in Dobraszczyk, P. and Butler, S. (Eds.) *Manchester: Something Rich and Strange*, Manchester University Press, pp. 326–329

Scott, S. (2009) 'Recloning the Emperor: the swimming pool as a negotiated order', *Symbolic Interaction*, 32 (2), pp. 123–145

Smith, D. M. (2000) 'Social justice revisited', *Environment and Planning A*, 32, pp. 1149–1162

Soja, E. W. (2010) *Seeking Spatial Justice*, University of Minnesota Press

Sport England (2020) *Sport for all? Why ethnicity and culture matters in sport and physical activity* [Online] [Accessed 17 March 2022] Available at: <https://www.sportengland.org/news/sport-for-all>

Steele, M. (2020) 'Baths' in Dobraszczyk, P. and Butler, S. (Eds.) *Manchester: Something Rich and Strange*, Manchester University Press, pp. 160–164

Stonewall (2020) *Stonewall response: Reform of the Gender Recognition Act* [Online] [Accessed 17 March 2022] Available at: <https://committees.parliament.uk/writtenevidence/17743/pdf/>

Strang, V. (2004) *The Meaning of Water*, Oxford: Berg Publishers

Stuckler, D., Reeves, A., Loopstra, R., Karanikolos, M. and McKee, M. (2017) 'Austerity and health: the impact in the UK and Europe', *European Journal of Public Health*, 27 (supplement 4), pp. 18–21

Swim England (2017a) *Making swimming accessible for people with dementia: The Swim England Dementia Friendly Swimming Project* [Online] [Accessed 17 March 2022] Available at: <https://www.swimming.org/dementiafriendly/about-the-asa-dementia-friendly-swimming-project/>

Swim England (2017b) *Guide to engaging trans people in swimming* [Online] [Accessed 17 March 2022] Available at: <https://www.pdf-archive.com/2018/03/21/swim-england-guide-to-engaging-trans-people-in-swimming/>

Swim England (2021a) *A Decade of Decline: The Future of Swimming Pools in England* [Online] [Accessed 17 March 2022] Available at: <https://www.swimming.org/swimengland/decadeofdecline/>

Swim England (2021b) *Impact of Coronavirus on school swimming and water safety* [Online] [Accessed 17 March 2022] Available at: <https://www.swimming.org/swimengland/impact-coronavirus-school-swimming-report/>

Swimming and Health Commission (2017) *The health and wellbeing benefits of swimming* [Online] [Accessed 17 March 2022] Available at: <https://www.swimming.org/swimengland/health-and-wellbeing-benefits-of-swimming/>

Szreter, S. (1988) 'The importance of social intervention in Britain's mortality decline c. 1850-1914: a reinterpretation of the role of public health', *Social History of Medicine*, 1, pp. 1–37

Taylor, D. (2021) 'Shukri Abdi: family of refugee schoolgirl who drowned sues police', *The Guardian* [Online] [Accessed 17 March 2022] Available at: <https://www.theguardian.com/uk-news/2021/jan/05/shukri-abdi-family-of-refugee-schoolgirl-who-drowned-sues-police>

Thomson, H., Kearns A. and Petticrew, M. (2003) 'Assessing the health impact of local amenities: a qualitative study of contrasting experiences of local swimming pool and leisure provision in two areas of Glasgow', *Journal of Epidemiology Community Health*, 57 (9), pp. 663–667

Tuck, E. and Yang, K. W. (2012) 'Decolonization is not a metaphor', *Decolonization: Indigeneity, Education and Society*, 1 (1), pp. 1–40

UK Parliament (2021) *Baths and Washhouses Act* [Online] [Accessed 17 March 2022] Available at: <https://www.parliament.uk/about/living-heritage/transformingsociety/towncountry/towns/tyne-and-wear-case-study/about-the-group/baths-and-washhouses/baths-and-washhouses-act/>

Wahid, A., Manek, N., Nichols, M., Kelly, P., Foster, C., Webster, P., Kaur, A., Friedemann Smith, C., Wilkins, E., Rayner, M., Roberts, N. and Scarborough, P. (2016) 'Quantifying the Association Between Physical Activity and Cardiovascular Disease and Diabetes: A Systematic Review and Meta-Analysis', *Journal of the American Heart Association*, 5 (9), pp. 1–12

Wain, N. and Joyce, P. (2012) 'Disaffected communities, riots and policing: Manchester 1981 and 2011', *Safer Communities*, 11 (3), pp. 125–134

Ward (2017) 'Swimming in a contained space: understanding the experience of indoor lap swimmers', *Health and Place*, 46, pp. 315–321

WHO (2021) *Drowning* [Online] [Accessed 17 March 2022] Available at: <https://www.who.int/news-room/fact-sheets/detail/drowning>

WHO (2020) *Physical activity* [Online] [Accessed 17 March 2022] Available at: <https://www.who.int/news-room/fact-sheets/detail/physical-activity>

Wiltse, J. (2007) *Contested Waters: A Social History of Swimming Pools in America*, The University of North Carolina Press

Yuan, W-X., Liu, H-B., Gao, F-S., Wang, Y-X. and Qin, K-R. (2016) 'Effects of 8-week swimming training on carotid arterial stiffness and hemodynamics in young overweight adults', *BioMedical Engineering OnLine*, 15 (151), pp. 673–684



**Appendix:**

**Table A1** *Mean Ranks Utilised for the Ward-Based Analyses*

<b>Ethnicity</b>	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
<b>Class 1</b>	105.7	105.7	145.2
<b>Class 2</b>	109.4	109.4	128.5
<b>Class 3</b>	148.1	142.9	146.7
<b>Class 4</b>	100.7	100.7	110.7
<b>Class 5</b>	106.4	106.4	98.94
<b>Very Good Health</b>	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
<b>Class 1</b>	122.7	122.7	109.0
<b>Class 2</b>	95.32	95.32	101.2
<b>Class 3</b>	114.5	114.5	111.6
<b>Class 4</b>	118.5	118.5	128.7
<b>Class 5</b>	138.5	62.00	200.0
<b>Bad Health</b>	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
<b>Class 1</b>	92.60	62.00	143.6
<b>Class 2</b>	124.6	124.6	109.6
<b>Class 3</b>	100.5	100.5	108.3
<b>Class 4</b>	105.2	105.2	104.9
<b>Class 5</b>	124.0	124.0	100.6
<b>Employment</b>	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
<b>Class 1</b>	111.3	111.3	114.2
<b>Class 2</b>	105.0	105.0	104.6
<b>Class 3</b>	106.1	106.1	99.35
<b>Class 4</b>	120.8	115.6	132.6
<b>Class 5</b>	123.1	123.1	140.8
<b>Education</b>	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
<b>Class 1</b>	139.8	121.0	183.9
<b>Class 2</b>	124.6	124.6	118.7
<b>Class 3</b>	97.16	97.16	102.2
<b>Class 4</b>	106.9	106.9	101.3
<b>Class 5</b>	117.8	117.8	116.6

**Table A2** Adjusted *p* Values for Dunn's Multiple Comparisons Tests

<b>Ethnicity</b>	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
Class 1 vs. Class 2	>0.9999	>0.9999	>0.9999
Class 1 vs. Class 3	0.4963	0.8796	>0.9999
Class 1 vs. Class 4	>0.9999	>0.9999	0.7933
Class 1 vs. Class 5	>0.9999	>0.9999	0.1087
Class 2 vs. Class 3	>0.9999	>0.9999	>0.9999
Class 2 vs. Class 4	>0.9999	>0.9999	>0.9999
Class 2 vs. Class 5	>0.9999	>0.9999	>0.9999
Class 3 vs. Class 4	<b>0.0495*</b>	0.1426	0.5167
Class 3 vs. Class 5	0.0679	0.2094	<b>0.0474*</b>
Class 4 vs. Class 5	>0.9999	>0.9999	>0.9999

<b>Very Good Health</b>	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
Class 1 vs. Class 2	<b>0.0285*</b>	<b>0.0267*</b>	>0.9999
Class 1 vs. Class 3	>0.9999	>0.9999	>0.9999
Class 1 vs. Class 4	>0.9999	>0.9999	>0.9999
Class 1 vs. Class 5	>0.9999	>0.9999	0.3606
Class 2 vs. Class 3	0.5952	0.5784	>0.9999
Class 2 vs. Class 4	>0.9999	>0.9999	0.9864
Class 2 vs. Class 5	>0.9999	>0.9999	0.2171
Class 3 vs. Class 4	>0.9999	>0.9999	>0.9999
Class 3 vs. Class 5	>0.9999	>0.9999	0.4304
Class 4 vs. Class 5	>0.9999	>0.9999	>0.9999

<b>Bad Health</b>	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
Class 1 vs. Class 2	>0.9999	0.2797	>0.9999
Class 1 vs. Class 3	>0.9999	>0.9999	>0.9999
Class 1 vs. Class 4	>0.9999	>0.9999	>0.9999
Class 1 vs. Class 5	>0.9999	0.4497	>0.9999
Class 2 vs. Class 3	0.1591	0.1522	>0.9999
Class 2 vs. Class 4	0.8603	0.7862	>0.9999
Class 2 vs. Class 5	>0.9999	>0.9999	>0.9999
Class 3 vs. Class 4	>0.9999	>0.9999	>0.9999
Class 3 vs. Class 5	>0.9999	>0.9999	>0.9999
Class 4 vs. Class 5	>0.9999	>0.9999	>0.9999

<b>Employment</b>	<b>Ward</b>	<b>Ward (city centre excluded)</b>	<b>Buffer</b>
Class 1 vs. Class 2	>0.9999	>0.9999	>0.9999
Class 1 vs. Class 3	>0.9999	>0.9999	>0.9999
Class 1 vs. Class 4	>0.9999	>0.9999	>0.9999
Class 1 vs. Class 5	>0.9999	>0.9999	>0.9999
Class 2 vs. Class 3	>0.9999	>0.9999	>0.9999
Class 2 vs. Class 4	>0.9999	>0.9999	0.6224
Class 2 vs. Class 5	>0.9999	>0.9999	>0.9999
Class 3 vs. Class 4	>0.9999	>0.9999	0.3724
Class 3 vs. Class 5	>0.9999	>0.9999	0.8627
Class 4 vs. Class 5	>0.9999	>0.9999	>0.9999

Education	Ward	Ward (city centre excluded)	Buffer
Class 1 vs. Class 2	>0.9999	>0.9999	0.2311
Class 1 vs. Class 3	0.9173	>0.9999	<b>0.0326*</b>
Class 1 vs. Class 4	>0.9999	>0.9999	<b>0.0310*</b>
Class 1 vs. Class 5	>0.9999	>0.9999	0.2642
Class 2 vs. Class 3	0.1076	0.1024	>0.9999
Class 2 vs. Class 4	>0.9999	>0.9999	>0.9999
Class 2 vs. Class 5	>0.9999	>0.9999	>0.9999
Class 3 vs. Class 4	>0.9999	>0.9999	>0.9999
Class 3 vs. Class 5	>0.9999	>0.9999	>0.9999
Class 4 vs. Class 5	>0.9999	>0.9999	>0.9999

\* p<0.05

**Table A3** Proportions of Demographic Classes (Expressed as Percentages)

Ethnicity	Ward	1km Pool Buffer	2.5km Pool Buffer
Class 1	2.2869	5.7708	3.0414
Class 2	1.6557	3.1194	2.2096
Class 3	3.5308	8.9517	4.5555
Class 4	15.7744	18.4755	19.7440
Class 5	76.7522	63.6826	70.4495

Very Good Health	Ward	1km Pool Buffer	2.5km Pool Buffer
Class 1	18.6410	29.3582	23.4319
Class 2	47.8402	39.9864	47.7927
Class 3	25.5539	23.0076	21.4926
Class 4	7.5166	6.1896	6.6846
Class 5	0.4483	1.4581	0.5982

Bad Health	Ward	1km Pool Buffer	2.5km Pool Buffer
Class 1	1.4570	1.8440	1.3306
Class 2	30.8096	24.9434	24.8425
Class 3	43.0693	41.9705	44.7122
Class 4	20.3542	24.7045	23.7250
Class 5	4.3099	6.5376	5.3896

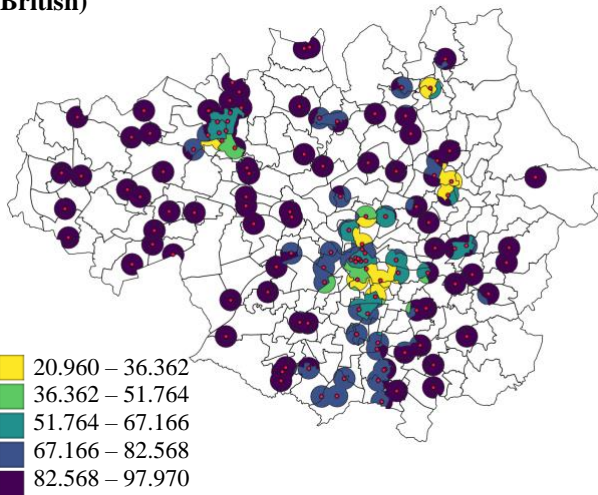
Employment	Ward	1km Pool Buffer	2.5km Pool Buffer
Class 1	10.7771	10.8147	9.9997
Class 2	59.3938	50.8480	55.7823
Class 3	24.1380	24.8402	26.7876
Class 4	4.4000	9.6881	5.7073
Class 5	1.2911	3.8090	1.7231

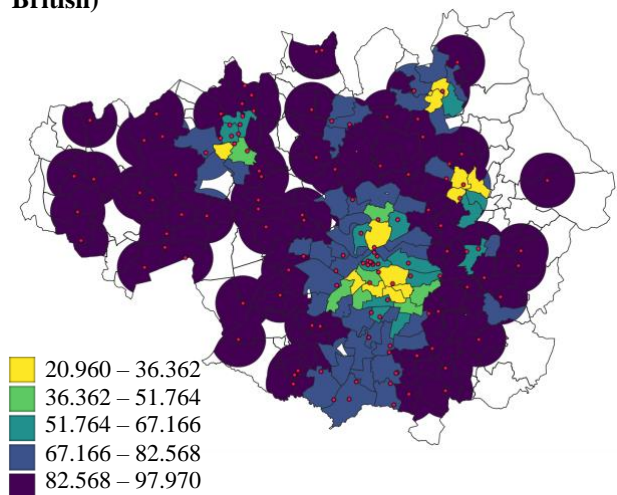
Education	Ward	1km Pool Buffer	2.5km Pool Buffer
Class 1	0.9807	3.2486	1.3088
Class 2	24.5404	20.7874	19.6797
Class 3	42.1109	36.5668	41.2422
Class 4	26.5616	29.5047	30.4197
Class 5	5.8063	9.8925	7.3497

**Figure A1** QGIS Maps of Intersections Between Pool Buffers and Demographic Indicators

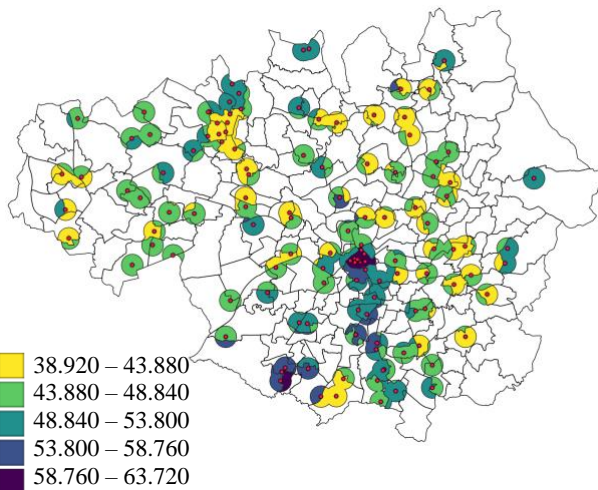
**(a) Intersection of 1km Buffer and Ethnicity (% white English, Welsh, Scottish, Northern Irish or British)**



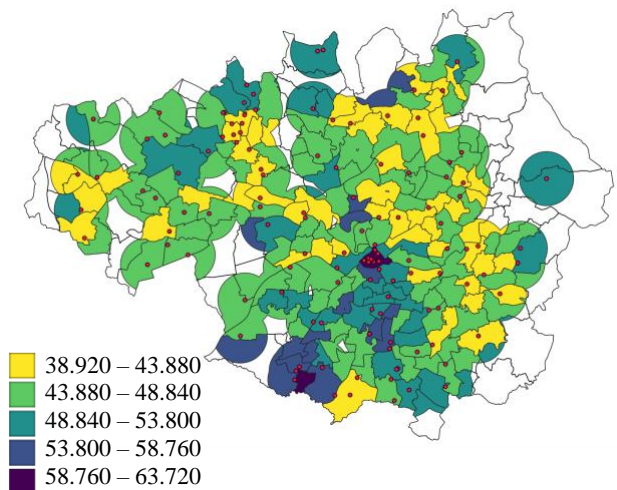
**(b) Intersection of 2.5km Buffer and Ethnicity (% white English, Welsh, Scottish, Northern Irish or British)**



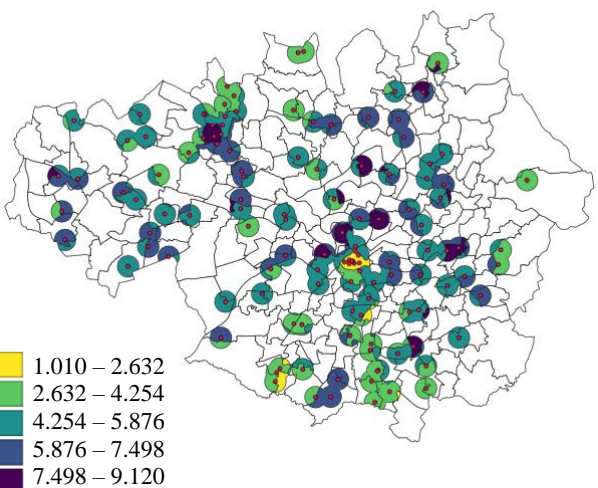
**(c) Intersection of 1km Buffer and Very Good Health (% self-reported very good health)**



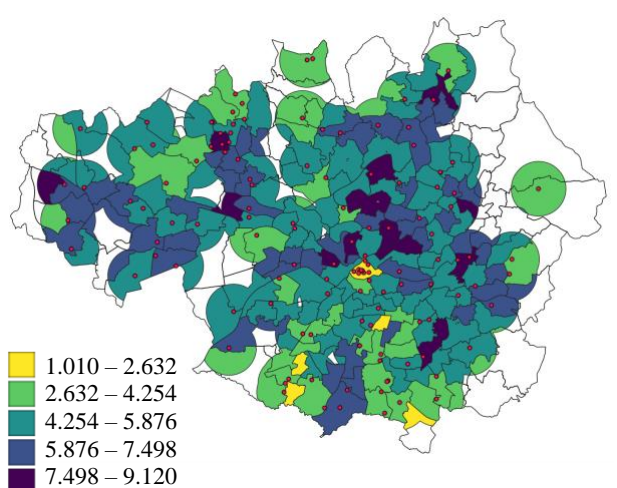
**(d) Intersection of 2.5km Buffer and Very Good Health (% self-reported very good health)**



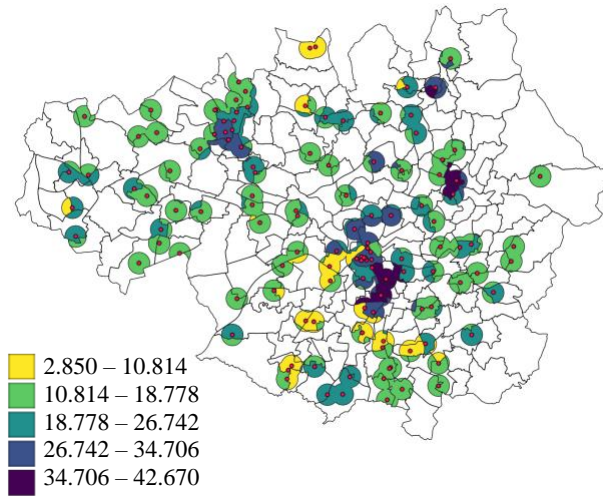
**(e) Intersection of 1km Buffer and Bad Health (% self-reported bad health)**



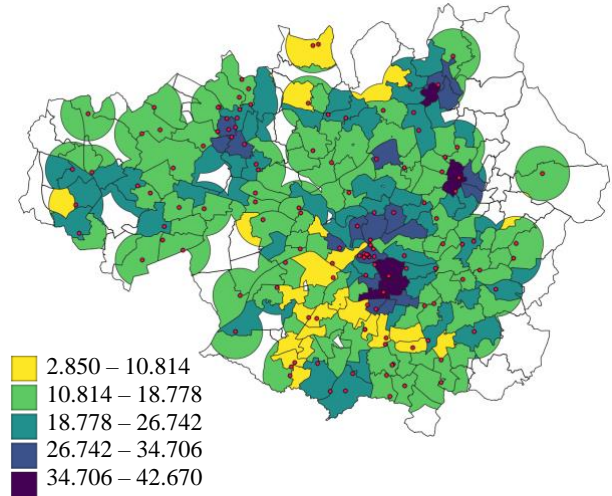
**(f) Intersection of 2.5km Buffer and Bad Health (% self-reported bad health)**



**(g) Intersection of 1km Buffer and Employment (% economically inactive)**



**(h) Intersection of 2.5km Buffer and Employment (% economically inactive)**



**Figure A1 (a)–(h)** show the intersections between the demographic indicators (with the exception of education; see Figure 3 in main text) and the 1km and 2.5km dissolved pool buffers.

Data sources: Office for National Statistics licensed under the Open Government Licence v.3.0; contains OS data © Crown copyright and database right (2011); O'Brien and Cheshire (2016); Swim England