

Population segmentation: an approach to reducing childhood obesity inequalities

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Abstract

Aims: The aims of this study are threefold: (1) to investigate the relationship between socio-economic status (inequality) and childhood obesity prevalence within Birmingham local authority, (2) to identify any change in childhood obesity prevalence between deprivation quintiles and (3) to analyse individualised Birmingham National Child Measurement Programme (NCMP) data using a population segmentation tool to better inform obesity prevention strategies.

Methods: Data from the NCMP for Birmingham (2010/2011 and 2014/2015) were analysed using the deprivation scores from the Income Domain Affecting Children Index (IDACI 2010). The percentage of children with excess weight was calculated for each local deprivation quintile. Population segmentation was carried out using the Experian's Mosaic Public Sector 6 (MPS6) segmentation tool.

Results: Childhood obesity levels have remained static at the national and Birmingham level. For Year 6 pupils, obesity levels have increased in the most deprived deprivation quintiles for boys and girls. The most affluent quintile shows a decreasing trend of obesity prevalence for boys and girls in both year groups. For the middle quintiles, the results show fluctuating trends.

Conclusion: This research highlighted the link in Birmingham between obesity and socio-economic factors with the gap increasing between deprivation quintiles. Obesity is a complex problem that cannot simply be addressed through targeting most deprived populations, rather through a range of effective interventions tailored for the various population segments that reside within communities. Using population segmentation enables a more nuanced understanding of the potential barriers and levers within populations on their readiness for change. The segmentation of childhood obesity data will allow utilisation of social marketing methodology that will facilitate identification of suitable methods for interventions and motivate individuals to sustain behavioural change. Sequentially, it will also inform policy makers to commission the most appropriate interventions.

INTRODUCTION

Tackling childhood obesity is one of the greatest public health challenges of the 21st century,¹ due to the potentially detrimental impacts of obesity on development, health and the wellbeing² of children in later life. Within England, the annual measurement of children aged five (Reception) and 11 (Year 6) is a mandated public health responsibility for local authorities and is conducted through the National Child Measurement Programme (NCMP), overseen nationally by Public Health England (PHE). These surveillance data

provide detailed intelligence to Local Authorities and allow benchmarking with similar areas,³ as well understanding obesity-related health inequalities that may exist on a localised level. Birmingham is the largest local authority in England and Wales with an estimated population of 1,073,045 (Census 2011), with a young and ethnically diverse population. In 2011, just under two-thirds (64%) of primary school-aged children were from a non-White British ethnic origin.⁴

The prevalence of obesity among Reception and Year 6 children in Birmingham has been

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higher than the national average since surveillance started in 2006/2007, with the most recent data showing prevalence of 11.3% and 23.9%, respectively, compared with 9.1% and 19.1%, for England (NCMP, 2014–2015). This has led to childhood obesity being stipulated as a priority within Birmingham's Health and Wellbeing Board strategy, giving it the political and strategic leadership required to confront this complex health issue.

Systematic reviews have demonstrated a clear link between lower socio-economic position (household and individual level measures) and higher prevalence of excess weight, both in the United Kingdom⁵ and in other high-income countries internationally. Global prevalence of obesity has almost doubled between 1980 and 2008⁶ and childhood obesity prevalence is emerging as a serious global public health challenge, where children reside in obesogenic environments leading to an imbalance of energy intake and reduced levels of physical activity.⁷ The association between deprivation and obesity is complex and varies by numerous demographic and environmental factors, with the general trend of combined prevalence of overweight and obesity much greater in developed countries than in developing countries and higher rates within less affluent families.⁸ In order not to exacerbate any underlying health inequities that may exist, the World Health Organization (WHO)⁹ Commission on Ending Childhood Obesity recommended that governments must implement interventions that have equitable coverage, especially for excluded or marginalised children who may be at a greater risk of obesity and dwell in areas of high deprivation.

In the United Kingdom, obesity prevalence in the most deprived decile is

Table 1 Experian's MPS6 group descriptions © Experian 2014.

similar levels (Birmingham 10.9%–11.3%, England 9.8%–9.1%). Likewise, in Year 6, the average level of obesity rose slightly (Birmingham 23.4%–24.2%, England 19.0%–19.1%), neither of which was statistically significant (Figure 1).

In terms of IDACI 2010 for Birmingham overall, Figure 2 shows the obesity prevalence trend between 2010/2011 and 2014/2015 for each IDACI quintile in Birmingham, for both Reception and Year 6 boys and girls, where one is the most deprived quintile and five is the most affluent.

Overall, childhood obesity levels have remained static at the national and Birmingham level; however for Year 6 pupils, obesity levels have increased in the most deprived quintiles for boys and

girls. The most affluent quintile shows a decreasing trend of obesity prevalence for boys and girls in both year groups. For the middle quintiles, the results show fluctuating trends.

Between 2010/2011–2012/2013 and 2012/2013–2014/2015 for Reception boys, there was a decrease of obesity in the most deprived quintile, dropping from 13.4% to 12.8%, although the most deprived quintile remains statistically significantly higher than the Birmingham average. For Reception girls, there was an increase in obesity prevalence within the most deprived quintile, rising from 12.2% to 12.9% for the same time period, demonstrating a shift to levels statistically significantly higher than the Birmingham average.

Figure 2 also highlights the difference in obesity prevalence in Year 6 between boys and girls. The proportion of Year 6 boys in the three most deprived quintiles is significantly higher than the Birmingham average. The obesity prevalence in 2012/2013–2014/2015 Year 6 boys in the most deprived quintile was 28.8%, with a Birmingham average of 23.9%. The level of obesity for Year 6 boys in the most affluent quintile had decreased to 19.0% and is significantly lower than Birmingham average. The results for the Year 6 girls show a correlation between deprivation and obesity; however, the most deprived quintiles are not significantly higher than the Birmingham average. The most affluent quintiles are significantly below

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the Birmingham average (19.1%) and also significantly lower than the England average (17.1%).

Closer examination of the sub-ward level data by deprivation quintiles has also highlighted that the inequality of childhood obesity prevalence is not just increasing year on year; the gap between the most deprived and most affluent quintiles is also changing. For the period

2010/2011–2012/2013, the difference between quintile 1 (most deprived) and quintile 5 (most affluent) for Reception boys was 5.1 percentage points. By 2012/2013–2014/2015, this gap had reduced by 0.4 percentage points to 4.7%. Conversely, the obesity prevalence gap between the most deprived and most affluent quintiles for Year 6 boys had increased from a 8-percentage point

difference in 2010/2011–2012/2013 to a 10-percentage point difference in 2012/2013–2014/2015. This worsening inequality is not visible when evaluating the data on a local authority level.

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