

Fat Chance?

Exploring the evidence on who becomes obese

Research Paper
November 2015

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2020health is conducting this research with the support of an unrestricted educational grant from AB Sugar. The views and opinion within this report do not necessarily reflect those of AB Sugar

Contents

About the authors	2
Introduction	3
Methodology	4
Findings	5
Age and gender	5
Green space and the built environment	6
Socio-economics	7
Mental health and disability	8
Sleep	10
Bullying and child abuse	11
Smoking	11
Ethnicity/Religion	12
Discussion	13
Conclusion	15
Policy considerations	16
Bibliography	18

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In 2007 Aaron moved to Dubai and began a project with UCL and the Health Authority of Abu Dhabi (HAAD) to study indigenous understandings of health and well–being in the Arabian Gulf. In addition to his ethnographic research, he worked in government hospitals in the Emirates to study the stigmatization of mental illness to help promote the introduction of psychiatry into primary health care. He also worked in clinics to study local conceptions of diabetes and other chronic health conditions. He returned to London in October 2010 and completed his PhD thesis on changing perceptions of the ‘self’ in Dubai, Abu Dhabi, and Oman, cross–cultural understandings of biomedicine and genetics, and humanity’s anxieties and struggles with modernity.

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Matt has a particular interest in the intersection of values, health, technology and public policy. He has a wide ranging portfolio of expertise that spans public policy, academia and third sector, including working in Parliament as a parliamentary researcher for a MP and shadow minister. Matt has convened numerous public symposia, has written extensively on the ethical, legal and social implications of new technologies and participated in several EU funded projects exploring public responses to new technologies. In his work with 2020health, Matt has co-authored reports on various health topics including reviewing post-transplant care for bone marrow transplant patients, reviewing the quality of care and models of best practice for those living with ankylosing spondylitis (AS) and conducting a qualitative evaluation of the benefits of the impact of in-store pharmacists using practical tools and techniques on the health and lifestyle of selected families. Matt has an undergraduate degree in political history and sociology and a Master’s degree in bioethics and medical law. He is Fellow of the Royal Society of Arts and Commerce (FRSA) and an honorary research associate at University College London (UCL).

Introduction

Current political, economic and social discourse on obesity in the UK illuminates the great complexities and myriad socio-economic considerations that inform people's health, diets, and health seeking behaviour. Recent data published in annual Health Survey for England reports suggest that at least a quarter of the adult population is obese, while two-thirds are overweight, and these rates are rising. Speaking before the House of Lords, Lord McColl of Dulwich, professor and former director at Guy's Hospital, London, summed up the urgency in addressing the country's rising weight gain: "The obesity epidemic is the worst epidemic to afflict this country for 90 years; it is killing millions and costing billions and the cure is free" (Lords Hansard, Thursday, 11 July 2013).

The effects on national health services are potentially staggering. In calling for behaviour change regimes, Sir Cyril Chantler, director of UCL Partners, outlines how 80% of health care budgets are now devoted to chronic illnesses and associated acute conditions. However, while general rates of obesity in the UK are known to be rising, it remains very difficult to speak about obesity demographics with clarity and precision. In order for health care interventions and behaviour change policy to be radically effective, target populations must be better understood. This study examines and compiles the wealth of current knowledge and statistics on obesity in England in order to address the question of 'Who is obese?'. Assessing common trends found in obesity research and comparing them to emergent studies provides important holistic perspectives on the complexity of obesity in the UK. By applying modern risk factors to answer the question of 'who' is affected by obesity, this project provides an important evidence base to inform future research into 'why' populations become obese, and 'how' novel health care platforms might address health seeking behaviour in the country.

Methodology

This report is a review of literature on correlations between obesity and a wide range of specific socio-demographic data sets. In order to research the complexity of these associations in Britain, searches were conducted, primarily through PubMed, across 16 potential factors. These searches included, in no particular order: age, gender, divorce rates, green space, housing and property value, crime rates, employment/unemployment, salary, fast food density, geographic location, ethnicity, mental illness, religion, sleep behaviour, bullying, and smoking. In addition, we conducted a general search for “obesity in the UK” for an overview of demographic information within the country. This initial search produced 1,670 results. We assessed each paper for overlap and relevance, and, due to the time constraints of the project, selected 100 research papers to represent the complexity within obesity, social science and health research. Preference was given to meta-studies that provided statistical and analytical summaries within the categories listed above. Since a goal of this research was to assess changes in demographic knowledge of obesity over the last decade, preference was also given to very recent literature, published in 2014 and 2015.

Unless otherwise stated, obesity, as referred to throughout this report, is characterised by a Body Mass Index (BMI) of 30 kg/m² (in accordance with the WHO guidelines for anthropometry). Overweight is classified as a BMI of 25 to 30, and a healthy weight is classified as 18.5 to 25. In order to broaden the diagnostic criteria, we searched for studies that explore obesity trends in both England and the UK at large. (Most studies are conducted in England, though some larger demographic surveys explore trends across England, Scotland and Wales.) We also specifically selected research that explored ‘obesity’, with BMI of 30 kg/m², and not ‘overweight’, because of the range of comorbidities that accompany this classification. However, it is acknowledged that many studies demonstrate correlations for BMI at large, regardless of WHO anthropometric categories. While there is a significant body of research that attempts to understand the relationship between common co-morbidities of obesity, such as type 2 diabetes and cardiovascular disease, this project selected specifically for obesity as a stand-alone morbidity in order to demonstrate the complexity of obesity profiles in Britain. In this way, we attempted to guard our analysis of obesity from specific risk factors for obesity co-morbidities, though it is acknowledged that many of these risk factors overlap.

Findings

Age and gender

Gender is a particularly difficult category to assign to obesity demographics in England. Within the UK, the rates of obesity are roughly equal for adult men and women (26.1%), while men are slightly more overweight than women (HSCIC, 2010; 2011; 2012; 2015). These national statistics are based on annual data from the Health Survey for England. This rate has risen steadily since the mid 90s, but has flattened in recent years, remaining relatively stable since 2010, though rates of obesity among men are still slowly climbing. The most recent reports from the Health and Social Care Information Centre compares gender rates for obesity over many years. In previous years, obesity was particularly gendered, with women being both more obese and overweight, but this has changed in the last two years, with adult men in England marginally surpassing the obesity rates of women (HSCIC, 2015: 2.3.1). Current obesity rates for men are lower in younger adult years than for women, and reach a peak for men between the ages of 45–54. Women are more at risk of becoming obese in their younger years, and remaining obese through their adult lives. However, while HSCIC data demonstrates some differences in obesity rates by gender and age, data is relatively homogenous between the sexes. It is important to acknowledge very recent research that demonstrates age and gender to be significant predictors of obesity in relation to numerous co-morbidities (Morrissey et al, 2015), though this data is influenced from risk factors of a great many conditions.

While this report does not speculate definitively as to why the age of onset for obesity is marginally gendered, it is perhaps not surprising, as the social lives of men and women are also gendered.¹ Recent research across socio-demographics in the UK highlights this gendering, with different comparisons between risk factors for obesity showing positive correlations for one gender, and insignificant or negative correlations for the other. Adult women, for example have much higher rates of obesity at lower income levels than men (HSCIC, 2015; Stafford et al, 2010, among many other studies), while rates of obesity for men appear much more affected by work environment, pressures and various employment behaviours and anxieties (Church et al, 2011; Shulte et al, 2007). Though upward employment mobility correlates with increased obesity among men, in women there are reverse associations. It is unclear how workplace culture informs these trends. Increasing pressures and stress of the workplace compounded by longer working hours and ready-meal culture may lead to higher BMI for men, while pressures on body image, and profound biases and prejudices inherent in job culture, may encourage upwardly mobile women to maintain healthier BMI. One study shows that in the United States, women are 16 times more likely to report weight discrimination in the workplace (Roehling et al, 2007).

Gender also seems particularly influential in the effectiveness of weight-loss programmes. A recent study shows that common weight loss programmes are particularly effective for men in both the short and long-term, and far less effective for women, though both men and women still benefit to some degree from obesity intervention programmes (Bhogal and Langford, 2014). Since gender is woven through every potential socio-demographic factor of obesity, it will be referred to throughout this review. As a result, this project argues that gender needs to

1. Unadjusted data for obesity rates show gendered data to be mirrored, but for a given socio-economic or demographic factor, gender becomes highly informative in understanding trends in obesity.

Findings

be carefully considered whenever health policy initiatives attempt to address a specific socio-demographic factor.

Green space and the built environment

Research indicates that neighbourhood characteristics share correlations with obesity rates. Research that simply links obesity to deprivation has the potential to overlook complexity in neighbourhood poverty influences. That is, when neighbourhoods are associated with lower socio-economic status, there is often a correlate to obesity; but residents of these neighbourhoods, regardless of individual household income or level of education, are equally exposed to certain characteristics and influences within their environment. One of these characteristics is fast food density in a given area. Multiple studies have demonstrated links between the rise of the fast food industry and obesity (Mohr et al., 2007; Ebbeling et al., 2004, for example), and there is also a wealth of evidence that links fast food consumption to obesity (Duffey et al, 2009; Moore et al, 2009; Bowman et al, 2004, among others). Research demonstrates that neighbourhood deprivation is positively correlated to fast-food density as well as obesity rates (see Fraser et al, 2010, for a comprehensive review). In parts of the West Midlands, for example, new research labels this phenomenon a type of ‘fat swamp’, where a dearth of food choices accompany exceptionally high rates of obesity in both adults and children (Saunders et al, 2015). Other research has tried to understand these trends in relation to employment locations, commuting routes and residential neighbourhoods in Cambridgeshire. The authors found that food options in the vicinity of employment have the highest correlations to obesity rates of the three, while exposure to fast food in all three domains promoted more high energy food consumption and greater BMIs (Burgoine et al, 2014).

Earlier studies in the United States have questioned the link between childhood obesity and fast food density (Sturm and Datar, 2005), showing insignificant correlations; others show that research on this link is conflicting (Black and Macinko, 2008). In the UK, however, new research contradicts this, showing very strong correlations between childhood obesity and fast food density (Fraser and Edwards; 2010, Cetateanu and Jones, 2014).

Obesity rates in the UK are also highlighted in other neighbourhood characteristics beyond fast food density (see Black and Macinko, 2008 for a recent meta-analysis). Structural characteristics such as good pavements (safety from traffic), proximity to necessary destinations, and safety from crime are all positively linked to lower BMI, the latter being highly correlated with lower obesity (De Bourdeaudhuji et al, 2015). These factors are also gendered, and research suggests that neighbourhood characteristics affect adult women more than men. Similar trends are found among children, where lack of green space (parks and recreation) and pavements are correlated with a strong increase in obesity among girls, but less so among boys.

Findings

Socio-economics

Socio-economic factors associated with higher rates of obesity in the UK are deeply complex and interconnected. This has been prevalent in health discourse in Britain for the greater part of two centuries. Engels, in his monograph on the ‘working class in England’ (1845) famously outlined health disparities as a result of the industrial revolution and poverty (see Engels and Kelley, 1845), which helped inform socialist and Marxist discourse aimed at improving the conditions of the proletariat. Since that time, while medical knowledge and modern healthcare infrastructure have improved the lives and longevity of all Britain’s residents, income inequality and health disparities between the poor and the wealthy have not changed (see Pickett and Wilkinson, 2015, for a recent review). Many modern critiques of health policy planning and research around the globe have emphasised the intense relationship between poverty and illness, in almost all forms (DeVecchio Good, 2002; Singer and Scott, 2003; Farmer, 2004, 2006; Bourgois, 2006; Napier, 2014). However, across the world, issues of modernity complicate this assertion. For example, according to the World Health Organisation, Arabian Gulf nationals in Qatar and the United Arab Emirates have some of the highest rates of obesity in the world, significantly higher than the UK (WHO NLiS, 2014, 2015), despite having some of the highest GDP per capita in the world, also higher than the UK (IMF, 2014). This makes it particularly difficult for researchers to make definitive claims on the influence of any specific factor. Different data categories can be easily compared to matching geographic or personal data on BMI, but this often ignores the influence of other factors. Nonetheless, some trends seem apparent from a comparison of literature on obesity published in the past five years.

The evidence that links poverty, deprivation and lower socioeconomic positions to obesity specifically (as well as poorer health across nearly all categories) is overwhelming in many developed nations. It continues to be so in Britain, and this report does not question these findings. (For recent clarification of obesity and comorbidities related to socio-economic factors in England see Morrissey et al, 2015; and for a meta-analysis of the same literature, see El Sayed et al, 2012.) In some British communities, deprivation is linked to double the obesity rates of some less deprived communities (Bogaert et al, 2013). As discussed earlier in this report, lower income and deprivation is a strong risk factor for obesity in women specifically, while the relationship is less clear for men (Stafford et al, 2010). In children, new research has shown that disadvantaged backgrounds are risk factors for both thinness and obesity, outlined the wide range of bodily repercussions of malnutrition (Pearce et al, 2015).

What has emerged in recent research, however, is that, within specific communities, obesity rates are now rising among other economic groups. In some areas, within middle and upper financial classes, men are becoming far more affected by obesity, but this trend is mitigated for women (Zhu et al, 2015). Another very recent research project conducted a cluster analysis to outline subgroups in UK populations that are affected by obesity. Among some subgroups they found that healthy, young females, disregarding socio-economic status, were particularly at risk for obesity (Green et al, 2015). The same study also found that the affluent and otherwise healthy elderly, and the unhappy, anxious middle aged, disregarding economic status, were particularly prone to obesity (though it remains unclear as to what is embedded within ‘anxious’ as a category

Findings

of living). In many cities and towns, researchers have found ‘hotspots’ of childhood obesity that overlap with both the poorest and wealthiest neighbourhoods. In studies of obesity among children in Leeds, for example, high prevalence of obesity was found in demographic ‘hotspots’ of both the very poor and the very affluent (Edwards et al, 2010). Recent research in Scotland also complicates simple models of deprivation and obesity. Scotland has one of the highest rates of obesity in the UK at nearly a third of the population, much higher than the national average of the UK. However, as these rates have risen in the past two decades (17% to 31% for men), socio-economic conditions in Scotland have improved while inequalities have decreased. The rises in obesity have affected all socio-economic groups, and in fact men from the more affluent groups exhibit the largest rises in BMI and obesity (Zhu et al, 2015).

Specifically, socio-economic mobility is associated with rising rates of obesity. Previous studies on socio-economic associations for BMI presumed stasis in economic position, but this is not a reality for many people in the UK. Research shows that both upwardly and downwardly mobile groups are correlated with higher rates of obesity than the stable rich or middle classes, with the downwardly mobile currently sharing the highest rates and rises of obesity. Upwardly mobile groups have the same obesity rates as the stable poor (Heraclides et al, 2010). To our knowledge, there is very little current research in the UK on the effects of rapid social change on obesity rates, and we argue that these types of mobility are a novel and crucial avenue for research as they indicate some powerful effects of social change. A much broader discussion could consider obesity in the UK as informed through deep anxiety and uncertainty of economic futures from the beginning of the financial crisis through to the present, and the stresses of insecure employment. Again, these rates are gendered. For the stable poor, obesity is much higher in women, for the stable wealthy, obesity is higher for men, and for the economically mobile, obesity rises for both men and women.

The next section discusses recent literature on mental health, primarily depression and anxiety, and its associations with obesity; but it is important to note that the links between economic mobility and mental health are their own avenue of research, and new future inquiry might explore these relationships in more depth.

Mental health and disability

Apparent from health research and literature in the last five years is a rising interest in mental health and its links to obesity and other health seeking behaviours. In many ways, rates of depression and anxiety in the UK mirror that of obesity. According to NHS data and studies from the Office of National Statistics, the number of cases of depression in the UK is rising by 100,000 every year, with 500,000 new cases between 2010 and 2012 (SSentif, 2012). One in five British adults experience some form of non-psychotic mental illness at any one time (Beaumont and Lofts, 2013). Following some initial research on the connection between depression and obesity (Onyike et al, 2003), the links between depression and BMI, and obesity in particular, have been given specific attention, with clear positive associations (Scott et al, 2007; Atlantis and Baker, 2008; Allison et al, 2009). Meta-analyses show that these correlations are gendered,

Findings

with more women than men supporting a positive hypothesis (de Wit et al, 2010), though data on gender and mental health has a long history of controversy, adding complexity to these rates (Pollard and Hyatt, 1999, for example). Research has become more confident of the associations in recent years; or rather, evidence of connectedness between obesity and mental health appears now more robust. Very recent studies have attempted to better clarify the link between poor mental health and obesity through larger comparisons of comorbidities, finding that these comparisons only bolster evidence of important connections between mental health and obesity (Somerville et al, 2015; Stranges et al, 2014).

As these relationships have only recently achieved a higher focus in obesity research in the UK, what is far less evident from the medical literature are hypotheses that suggest mechanisms and causes for the relationship between poor mental health and obesity. One reason research in this area is lacking may be due to the unclear directionality between common mental illness and excess weight. This is a result of the largescale complexities that inform the aetiology of both conditions. Poor mental health is especially subject to a great many factors. For any given individual, for example, it can be very difficult to determine if depressive or anxious states precede and exacerbate weight gain or poor BMI health seeking behaviours, or if excess weight is more of a contributing factor towards common mental illness. There have been some attempts to research this directionality, but evidence remains conflicting. One recent study among 3,388 British adult men found that poor mental health is an indicator of future excess weight gain, but not the converse (Fezeu et al, 2015). Another study among a larger British cohort suggests that obesity predicts poor mental health in women, but not the converse (Geoffrey and Power, 2014), expanding upon similar findings by Faith et al, 2011. However, Geoffrey and Power conclude that because directionality remains unclear while depression and obesity co-indication is very strong, physicians should routinely screen for unhealthy BMI and depression when presented with either condition.² Again, citing Green et al (2015), strong correlates to obesity are found in the ‘unhappy, anxious middle aged’. There is also research that suggests excess weight gain may result from pharmacological intervention for depression, namely for individuals who are treated with nortriptyline, offering evidence that both the symptoms and treatments for depression might inform obesity (Uher et al, 2011). Lastly, Phillips and Perry (2015) present data that complicates these associations. They found that among metabolically healthy obese,³ the association between obesity and mental illness was very weak compared to the metabolically unhealthy obese. This suggests that it is the metabolic profiles of people that link to depression, rather than the excess fat itself.

Britain’s disabled communities have much higher rates of obesity than the general public. This is apparent for both the physically and mentally disabled, including blindness, deafness, or those with developmental differences. Britain’s deaf community, for example, have much higher rates of obesity than the general population (Emond et al, 2015). This recent study also asks further questions on depression and BMI, finding that the deaf community has very high rates of self-

2. It is important to note that this recommendation is also based on data that links depression and unhealthy underweight BMI.

3. Phillips and Perry categorise the metabolically healthy obese as a less common subtype of obesity where individuals maintain normative blood sugar and blood pressure levels, and health inflammatory profiles. However the definition and characteristics of MHO is under debate (citing Phillips, 2013).

Findings

assessed depression (ibid). In addition, many studies are finding correlations between obesity and psychotic illness (Gurpegui et al, 2012; Gardner-sood et al, 2015). These correlates are rather striking, with half of all patients with psychosis maintaining a BMI over 30.

Sleep

Studies of metabolic disorders and psychosis demonstrate very strong correlates to obesity, but some scientists argue that these links highlight other independent lifestyle variables that contribute to weight gain. In particular, very recent research has explored the role of sleep, and more precisely lack of sleep, as one of the causal mechanisms of obesity in patients with psychosis (Boudebessé et al, 2015). It has long been known that metabolic processes are deeply altered by sleep, though the science of sleep itself is, like most cognitive sciences, still relatively unexplored. Patients with psychosis are often unable to sleep, or unable to remain asleep for long periods of time. It is thought that sleep disruption translates into metabolic disruptions that contribute to the high rates of obesity among those with severe mental illness (ibid).

Sleep has become an important area of study in understanding metabolism. A significant amount of research in the last 15 years has analysed the connection between sleep and BMI in a wide range of contexts, but data remains conflicting. There is not space in this report to list all evidence, but a careful review of the literature from Patel and Hu in 2008 shows that while correlations between length of sleep and BMI for both adolescents and adults are variable, overall, research indicates that sleep is a useful category as an independent risk factor for obesity. In the UK, recent research is even more conclusive. A more nuanced study that examined night-time habits, sleep duration and quality, and obesity (among other categories) found that all three are very strongly correlated (Arora et al, 2013). Shorter sleep durations and poor sleep quality were positively associated with higher BMI, and it was demonstrated that this was partly, but strongly, connected to the use of technology at bedtime (ibid). Furthermore, there is recent research that links modern use of electronic media by adolescents to both sleep disturbance and depression (Lemola et al, 2014). Television use and technology are often cited as risk factors for obesity (see Smith and Hamar, 2014, for a recent study), though these studies often link technology use to a lack of physical exercise, rather than its effect on sleep (Hadgraft et al, 2015). New research might examine more closely the relationship between television, sleep and metabolic disorder.

Less researched are a wide range of other factors that may affect sleeping habits and sleeping quality in Britain. The evidence that healthy sleep promotes healthy bodies is very convincing; however from our initial review, there is a surprising lack of research that attempts to understand emerging British night-time habits in relation to obesity. Furthermore, while we present evidence that severe mental illness, sleep, and BMI are intertwined, less is understood about the role of non-psychotic illness and its role in affecting both sleep habits and obesity. A robust body of research shows that depression and insomnia share a very strong link (See Nutt et al, 2008 for a review). Evident from psychiatric literature, the link is so strong that many psychiatrists are concerned that the two can be confused in the clinical encounter, as causation pathways

Findings

appear to be bi-directional. Many people can become depressed from bouts of insomnia, and many people have bouts of insomnia because they are depressed (Jindal and Thase, 2004). As reported, depression and anxiety are on the rise in Britain. We argue that further research is necessary to understand depression, anxiety, electronic media use, and other novel factors that influence sleep habits and thereby potentially hold relevance to obesity.

Bullying and child abuse

Research has recently targeted a range of health problems in adults that may be attributable to the long-term effects of victimisation in childhood. Two meta-analyses and reviews of literature separately demonstrate a significant correlation between childhood traumas and abuses and adult obesity (Danese and Tan, 2014; Hemmingsson et al, 2014). Furthermore, these meta-studies show that this correlation is not significant during childhood and adolescence, highlighting the difficulty in applying early interventions. Developing upon these studies, a team of researchers at Kings College London examined bullying victimisation specifically, and its long-term effects over five decades (Takizawa et al, 2015). One aspect of this study which makes it valuable is that it controlled for other risk factors such as childhood BMI and parents' income, providing evidence that bullying victimisation is its own valid demographic category in future obesity research and intervention.

Smoking

Smoking is an important demographic factor to consider in obesity research, as it is understood to be a powerful risk factor for conditions associated with obesity, such as certain types of cancers, cardiovascular diseases and even diabetes.⁴ Furthermore, while there is not space to discuss them here, many socio-economic risk factors associated with smoking in the UK are also linked to obesity rates. For both of these directions, however, there are some striking differences. For example, according to HSCIC data for smoking in Britain, men are far more likely to smoke than women, and the rates of smoking for all adults are decreasing as obesity is increasing (HSCIC 2014).

Examining smoking habits adds complexity to obesity research. Though both smoking and obesity are severe risk factors for cardiovascular disease, research shows that smoking is a negative risk factor for obesity, with smokers having on average much lower BMI than non-smokers (Dare et al, 2015; Booth et al, 2015). Dare et al, in a study of nearly half a million British adults, also show that former smokers are more at risk of obesity than both current smokers and those who have never taken up smoking (ibid). These recent studies are important in obesity demographics as they indicate that some people may take up or continue smoking as a method of weight control. Furthermore, they suggest that new therapeutic interventions for smoking must also better include simultaneous intervention pathways for weight gain.

4. Smoking habits and nicotine addiction are global health concerns with a massive international body of literature and research. For an outline of health effects, see WHO guidelines and information on tobacco.

Findings

Ethnicity/Religion

Research on ethnicity and demographics in Britain has in the past focused on a very wide range of health concerns and impacts in minority communities, showing unambiguously that conditions related to obesity (diabetes and coronary disease, for example) are disproportionately high among minority communities (see Smith et al, 2000 for a comprehensive discussion on health disparities among Britain's ethnic communities). In recent years, the discrepancy between obesity rates for some ethnic minorities in Britain, namely Afro-Caribbean and South Asia populations, and the general British population has remained significant (Rennie and Jebb, 2005; El-Sayed et al, 2011). These data are also gendered, with ethnic women often averaging nearly twice the obesity rates of ethnic men (ibid). Other studies show this gender bias to be strong in ethnic children as well, though both ethnic boys and girls, across social classes, were more overweight in relation to the general British public (Saxena et al, 2004; Wardle et al, 2006; Harding et al, 2008; Taylor et al, 2008; El-Sayed et al, 2011). Across all data, women from Afro-Caribbean descent maintain the highest rates of obesity, in both adults and children.

These correlations remain fairly strong in Britain, although recent research suggests they are not particularly useful in and of themselves as aetiological suppositions. New studies that account for employment, age, gender, neighbourhood infrastructure and socio-economic positions demonstrate that ethnicity has no significant correlation to obesity on its own (Higgins and Dale, 2012). Health seeking behaviours among ethnic groups in the UK appear to be influenced by alternative factors beyond cultural specificities. These alternative factors are complex, and it remains difficult to highlight different societal factors against one another. In 2008, Taylor et al published research comparing ethnicity and socio-economic data in relation to high rates of obesity among ethnic groups in Britain, and found no significant differences when compared to the British public at large. Citing these findings, Higgins and Dale (2012), through their own research, have demonstrated that parental obesity is far more predictive of childhood obesity than is ethnicity, echoing less comprehensive research published in the past (Reilly et al, 2005). It is important to note that this data is also gendered, and maternal BMI is more correlated to childhood obesity than paternal BMI.

Religion has also been studied in correlation to obesity rates in the UK. However, like recent research on ethnicity, findings are very ambiguous in their assessment of religion as an independent risk factor for obesity. A large study based on the Health Survey for England 2012 suggests that religious affiliation in the UK does have a positive association with increased BMI for Christian groups, and for waist to hip ratios for Christian men (Lycett, 2015). What is less clear is the effect of religion as an explanatory model for behaviour, a debate long explored in the history of social science. What these findings could promote, however, is another public space in which to progress health care education, namely religious centres, which in current programmes may be under-utilised as places for health advocacy.

Discussion

This research on recent correlations of obesity presents evidence that questions many normative assumptions on ‘Who is affected by obesity’ in Britain. Before the last decade, health research in the UK understood obesity as a condition that strongly affected particular subgroups of the population. Deprivation, especially, has been at the forefront of discussions, and research often understood other correlates as extensions of poverty. Women also traditionally had higher rates of obesity than men, and these factors combined helped shape policy discussions and health care initiatives. This research does not question these links, especially in historical contexts when obesity levels in the UK were particularly endemic, both geographically and socially. HSCIC reports based on findings from the annual Health Survey for England present robust gendered data on obesity, physical activity and diet as evidence for future policy initiatives. However, we do argue that a review of recent literature suggests the obesity demographics presented by the HSCIC are incomplete.

This new research indicates that obesity profiles in Britain are becoming increasingly complex and widespread. As obesity in the UK becomes epidemic and de-localised, the condition appears to be mirrored across demographic profiles that strongly challenge the simplicity of the normative healthcare landscape. Health disparities among Britain’s economically and socially deprived communities remain high, but research indicates that the economically mobile have some of the most rapidly rising obesity rates in the UK, and that obesity is also rising among some groups of Britain’s most wealthy.

What is particularly highlighted in recent research, though rarely explicitly stated, is that obesity rates seem to be deeply influenced by social change (not just influences within static social categories). The studies we have compiled for this review show a subtle trend that has become increasingly evident over the last decade. It is highlighted in economic mobility, rising rates of mental illness, technological habits and engagements, and rapidly shifting urban ground. Argued here, broadly speaking, is that many of these categories strongly hint to a meta-structure that remains profoundly under-researched and largely ignored. This is the structure of uncertainty, a type of habitus that influences the terms of emotional engagement between an individual and their daily life. Insidiously, it undermines health seeking behaviour by making daily decision processes cognitively intolerable and emotionally taxing. A simple call for research, then, is premised on the suggestion that ‘body’ and ‘self’ are intimately interwoven in their relationship with obesity. Due to the complexity of British living, as one is increasingly unable to construct an image of ‘self’ or life in the future, individuals are perhaps less likely to be able to envision their future bodies and health needs. This may have strong implications for coping with mental health, committing to healthy exercise and sleeping habits, and, crucially, maintaining a healthy diet, among other daily practices. This has ramifications for any policy that proposes behavioural regimes to encourage good metabolic health.

The past decade has seen powerful macrocosmic events impact British daily life. Financial uncertainty, for example since 2007/08, has provided a backdrop in Britain for job insecurity, sudden and intense downward economic mobility, shifting employment structures, and imbalance in economic markets. This same uncertainty remains striking in new trends of home ownership and in the housing market more widely, where rent culture influences long-term

Discussion

planning and thinking. Pressures of ‘modernity’ and dependency on technology complicate health seeking behaviours by potentially promoting sedentary activity in both work and leisure, and interfering with sleep. Mental health is a particularly striking avenue of obesity research, as trends in obesity in the UK parallel trends in depression and anxiety, seemingly independent of deprivation and wealth.

Interventions that target specific lifestyles and habits can be useful in addressing common themes in obesity. These initiatives are premised on ‘scaling up’ to address a large demographic category. However, this project suggests that, as the obesity epidemic in the country becomes increasingly ubiquitous, the modus operandi must evolve to think through health more holistically. As well as making health a ‘demographic’ concern, this project argues that policy should also serve to be ‘making health personal’. Holistic understandings of obesity in the UK can better understand health seeking behaviours through a wider range of complexities. Policy can then also work to help people cope with meta-structures that hinder behaviour change. Lastly, it is worth noting that many of the health interventions that help address obesity trends in the UK may also be effective in combating a wider range of correlations to obesity. In this way, approaches to obesity that recognise and incorporate complexity might impact a host of rising health problems that affect communities across Britain. The same interventions that encourage healthy BMI may improve energy levels through metabolic process and sleeping habits, while reducing risk of mental health problems, diabetes and a range of other comorbidities not discussed in this report.

Conclusion

Increasing rates of obesity in Britain beg for a modern and constant evaluation of knowledge in health demographics to tackle the country's most prolific chronic conditions. In order to inform discussions on the causes of obesity in Britain, and crucially, how the country can cooperate to address its growing weight problem, this paper researches, reviews and compares current profiles of 'who' in Britain is obese. Through assessing new research on UK obesity, it argues that long-held assumptions on socio-economic demographic correlations to obesity remain strong, but that these assumptions are incomplete. Most saliently, this project demonstrates how complex obesity has become in recent years. New understandings of obesity rates in the country not only recognise the long-term implications of poverty and inequality, they also demonstrate the complexity of economic instability and mobility as it applies to health, and obesity specifically. Increasingly, obesity is also being understood holistically through its associations with poor mental health, in particular anxiety and depression. The built environment, through provisions of public green-space, pavements, safety and, importantly, healthy food options, is also tied to BMI. While many of the different factors researched in this review are shown to strongly apply to specific gender and age groups, there is, increasingly, no 'best fit' category in terms of a risk factor for obesity, further demonstrating the complexity in profiling UK obesity. Evidence that relates sleep and technology use to obesity rates serve as an example of how modern lifestyles can powerfully impact health, independent of socio-demographic positions.

In thinking through research that highlights emerging risk factors for obesity, this project identifies 'uncertainty' as a habit-forming structure that undermines the individual's ability to manage sustainable health. In conclusion, we argue that there are macro and micro-political implications for future policy research that aims to address the increasing rates of obese and over-weight people in the UK. In addition to targeted programmes that address specific risk factors for high BMI, we suggest that more research is needed to identify a holistic approach to the complexity of obesity in the country. Given the strong heterogeneity in obesity profiles in the UK, we suggest that healthcare interventions will need to move beyond one-size-fits-all models in recognition of the lived experience of the individual and in order to 'make health personal'.

Policy Considerations

Forty years ago, warnings on the rise in prevalence of obesity began to emerge from the National Institutes for Health in the USA. By 1985 they had raised the stakes and were referring to obesity as a 'killer disease' (Gomez, 2014). In 1991 the UK government acknowledged that obesity represented a national threat to public health but there was no accompanying strong policy. Early in 2001 the UK's National Audit Office produced a report warning government that if nothing changed, a quarter of the population would be obese by 2010; their prediction was almost exact, and today over 26% of the UK population are clinically obese.

Whilst politicians will point to action that has been taken, such as support for breastfeeding to nutritional standards in schools (no longer statutory for Free Schools and Academies), campaigns against fat and salt, schemes to boost participation in sport and activity, and most recently the 'Responsibility Deal' around food reformulation, workforce, activity and alcohol, the results show for themselves that no approach to date has stopped the inexorable rise in the nation's weight.

This begs many questions, not least of which is whether we have targeted at-risk populations effectively. We live in times of rapid social change and no modern effective policy can afford to ignore this. In recent weeks the Health Select Committee's Childhood Obesity Inquiry has heard evidence repeating the emphasis of people with lower incomes being highly correlated with obesity. This is historically true, but as this report has shown, it is only part of the story and an increasingly distracting chapter.

When 2020health looked at the evidence, we found it wasn't simply about those who were poor; it was younger, socially deprived *women* most at risk. Living in an environment that has a high density of fast food outlets, poor pavements, insufficient green space and a perceived fear of crime all correlated with an increase in obesity in *girls*. For *men*, they are more likely to be obese if their place of work has a high density of surrounding fast food outlets. Economic instability is now associated with some of the most rapidly rising rates of obesity in the UK, which constitutes a massive challenge as we anticipate greater automation of workplace and fewer middle class jobs. Again this is gendered: for the stable poor, obesity is much higher in *women*, for the stable wealthy, obesity is higher for *men*, and for the economically mobile, obesity rises for both *men and women*.

Obesity is a highly complex problem with multiple drivers, many of them outside of the health sector. It is hard to understand the reticence of successive policymakers to respond to the economic and social crisis that obesity represents. We have failed the current generation; how can we tolerate a betrayal of the next?

A new children's obesity strategy has been promised and the government has another chance. What this report emphasises is that we cannot take the same piecemeal, short-lived, incomplete, peripheral, voluntary approach and expect outcomes to improve. Nor is there a silver bullet which will change our ever-fattening trajectory. We now know that we have to understand exactly who we are targeting. We have to understand the complexity of the problem and that this requires a cross-departmental, Cabinet-level high-status commitment to a strategy. We have to insist on

Policy Considerations

some environmental changes if people are ever to stand a chance of making healthy choices. We need to acknowledge that schools are the most significant place outside of the home where habits are formed and crucially, government has to decide on what is no longer an optional but a necessary intervention. Along with our 2014 report 'Careless Eating Costs Lives', we hope that this study will serve as a valuable contribution to the evidence base on obesity to inform intelligent health interventions and workable solutions. Our children deserve nothing less.

Julia Manning
Chief Executive
2020health

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2020health research and activity includes the following workstreams:

Fit-for-School/ Fit-for-Life/ Integration and Innovation/ Forgotten Conditions / Health Economy

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"GPs are well aware of the problems alcohol abuse can cause. We see the long term damage to individuals and their families probably more than any other group of healthcare professionals in the UK. I hope this guidance will help GPs and their patients make informed decisions that will prevent serious ill health in the future."

Dr Clare Gerada

Chair, RCGP

Head of Wellbeing: An essential post for secondary schools? (2015)

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Dr Sarah Wollaston MP

Chairman, Health Select Committee

"This report begins to form an evidence base about an issue rarely high up the national agenda - the wellbeing of pupils and staff. As such, it makes a valuable contribution to this debate and raises issues that teachers and school leaders will want to consider."

Baroness Morris of Yardley

Former Secretary of State for Education

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"Addressing the strategic challenge of the rising tide of people with long term conditions lies in patient centred care. Personalising care with care planning, integrated working by sharing the medical record and introducing immediacy using telehealth monitoring and telemedicine will transform patient care, improve outcomes and achieve more for less. This report adds considerable value to the debate on how services can be transformed using telehealth in the future."

Dr Shalid Ali

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Published by
2020health.org
© 2015 2020health

Price £20

ISBN 978-1-907635-89-2



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