

The changing social patterning of obesity: An analysis to inform practice and policy development

- In the UK, overweight and obesity has increasingly become a condition associated with lower socioeconomic position and evidence suggests that such a social gradient has become established in childhood.
- The emerging socioeconomic gradient of obesity in children is of particular concern because both overweight and obese children have increased risk of obesity in adult life and weight management interventions among children and young adults are of limited effectiveness.
- Analyses of a range of existing datasets have largely confirmed reported trends in obesity in the UK population, including its strong social gradient.
- Levels of excess body weight appear greater among women than among men, although there is some evidence that men are catching up. Levels of overweight and obesity increase with age from childhood up to age 75 years, suggesting that efforts to prevent or reduce obesity and overweight need to start early in life and continue at least until retirement age.
- Implementation of the NICE guidance on prevention and management of obesity will need to take account of this social patterning and ensure that interventions proposed do not further widen existing inequalities.
- Weight gain among parents may be amplifying the growth of childhood obesity through the generation of a repeating cycle. Breaking this cycle will require a range of interventions including attention to preventing excessive weight gain in early childhood, among young parents and during pregnancy.
- Inconsistencies in the datasets available hinder their usefulness for research and policy analysis. An assessment of the data needed to monitor trends relevant to national policy and to intervention strategies would be of value.

Background

The prevalence of overweight and obesity continues to increase across the world. Long-term consequences include raised risk of developing hypertension and stroke, coronary heart disease, diabetes, osteoarthritis and certain cancers. Recently, a socioeconomic gradient (i.e. people in poorer socioeconomic circumstances are more likely to experience poorer health outcomes than those living in better circumstances) in the prevalence of overweight and obesity has emerged in the UK. Recent cross-sectional studies suggest that socioeconomic gradients have become established in childhood.

The emerging socioeconomic gradient of obesity in children is of particular concern because both overweight and obese children have increased risk of obesity in adult life and weight management interventions among children and young adults are of limited effectiveness.

This summary report is drawn from a project which used a range of existing datasets to explore the emerging socioeconomic patterning of obesity and its main risk factors in the UK. It summarises our findings on age, sex and socioeconomic trends in (i) overweight and obesity, using national cross-sectional and longitudinal data and (ii) weight gain among parents and its influence on weight gain in children, using national cohort studies.

Full details of this project can be found on the PHRC website (www.york.ac.uk/phrc/).

Methods

Analyses were conducted using data from: two British cohort studies (one historical birth cohort, started in 1958, and one contemporary cohort, started in 2000) and the annual cross-sectional national health surveys for England and Scotland.

1958 Birth Cohort Study

Analyses of the 1958 Birth Cohort used data on approximately 17,000 males and females followed up prospectively (at ages 7, 11, 16, 23, 33, 42, 45 years). We examined socioeconomic differences in overweight and obesity, using international cut-offs for body mass index (BMI), comparing manual and non-manual social groups, as defined by adult occupation and

by social origins (occupation of father). Socioeconomic differences in BMI were assessed at different ages from childhood to adulthood. The BMI of about 3,000 4-18 year-old offspring was examined in relation to BMI gain over different periods of the cohort members lives, comparing the association in social class groups. Multilevel and logistic regression models were used to test inter-generational associations. BMI was standardised in several analyses to allow comparison between ages and generations.

Millennium Cohort Study (MCS)

The MCS is a longitudinal study, which was set up to examine the social, economic and health-related circumstances of babies and their families. It includes a relatively high number of families from ethnic minority and disadvantaged areas. Data were collected when each cohort child was nine months and three years old. Interviews were conducted with the main carer (usually the mother) and their partners, and information obtained on self-reported parental weight and height, the child's last weight (~ 9 months), socioeconomic position, ethnicity and a range of other covariates. At three years, the child's weight and height were measured. For 8,561 children with complete measurements, we used regression analysis to assess social patterning in weight gain to three years and BMI at three years, in relation to maternal and partner weight gain.

Health Survey for England (HSE) and Scottish Health Survey (SHS)
Analyses of the HSE and SHS data from 1991-2004 were weighted to allow comparisons between years. Logistic regression was used to model the relationship between the three main binary outcomes (obesity, overweight and high waist-hip ratio (WHR)) and a number of explanatory variables (e.g. age, year and gender) separately for male and female adults and children.

Whilst we were able to use common definitions for measures of obesity and overweight and social class, there were limitations that prevented us from combining datasets. The analyses are thus presented separately.

Key Findings

Age, sex and socioeconomic trends in overweight and obesity Our findings support and extend those of the published research literature, which suggests that the obesity epidemic continues to grow unabated. Offspring in the 1958 birth cohort have on average greater BMIs than their parents at similar ages in childhood, and year-on-year increases in age-group specific prevalence of overweight, obesity and high waist hip ratio (WHR) were observed in the national health surveys. In the HSE, women have higher levels of obesity overall, but men are more likely to be overweight at all ages. Among children, girls were more likely to be overweight and obese at most ages. However, the increases in obesity and overweight have been proportionately greater since the early 1990s in men than women, indicating a convergence of these trends. Cross-sectionally, prevalence of obesity, overweight and high WHR increases up to age 75 years, but thereafter declines somewhat.

Although socio-economic differentials in BMI were not present in members of the 1958 Birth Cohort when they were children, or in their own offspring in childhood, there is evidence that differentials are emerging at age three years in the MCS, with marked differences between the 'never worked and long term unemployed' group and higher social groups. The socio-economic gap seems to be wider for females than males at all ages and across time in the national health surveys. However, although we have demonstrated marked socio-economic patterning of obesity and markers of behavioural risk in adults and children, males and females, our analyses have not shown that the gap between rich and poor has widened, or narrowed, since the early 1990s.

Weight gain among parents and its influence on weight gain in children We found considerable evidence for longitudinal and intergenerational influences on obesity. In the 1958 Birth Cohort, adiposity tracked from childhood into adulthood. Moreover, we found that parental BMI independently predicted offspring BMI and, if both parents were overweight or obese, then the chances of offspring being overweight or obese were even greater than if one parent had excess

body weight. BMI in adulthood was better predicted by social class of origin than concurrent social class, although both had an independent effect. In the MCS, there was evidence that socioeconomic patterning of weight gain to 3 years was linked to parental weight gain. In families where the household socio-economic classification was 'never worked or long term unemployed', weight gain from 9 months to 3 years was predicted by maternal weight gain over the same period. Socioeconomic patterning of weight gain between 9 months and 3 years for the whole cohort was abolished once parental weight gain was taken into account.

Conclusions

Analyses of the datasets have largely confirmed reported trends in obesity in the British population, including its strong social gradient. However, within this broad conclusion, there are a number of more detailed findings which have implications for future policy, practice and research.

Age, sex and socioeconomic trends in overweight and obesity

Obesity and overweight have increased over time since 1993 in the national health surveys. Levels of excess body weight are greater among women than among men, although there is some evidence that men are catching up. Levels of overweight and obesity increase with age from childhood up to age 75 years. This finding suggests that efforts to prevent or reduce obesity and overweight need to start early in life and continue at least until retirement age. Socioeconomic inequalities in body mass are marked although data from the HSE suggest these do not appear to have widened over the last 15 years. There is a clear need to focus on these inequalities in body mass.

Implementation of the National Institute for Health and Clinical Excellence (NICE) guidance on prevention and management of obesity will need to take account of this social patterning and ensure that interventions proposed do not further widen inequalities in obesity and overweight. Levels of obesity are worse in some regions of the UK than others, after controlling for social and demographic factors. These regions, which include Scotland, the North

East, Yorkshire and Humber, and the East and West Midlands, will need to make greater efforts to reduce levels of obesity than those regions with relatively lower levels of obesity.

Weight gain among parents and its influence on weight gain in children. The presence of intergenerational effects in both the 1958 birth cohort study and the Millennium cohort study was striking and suggests an important priority for public health interventions. Intergenerational effects may presently be amplifying the growth of the obesity epidemic through the generation of a repeating cycle. Breaking this cycle will require a range of interventions including attention to preventing excessive weight gain in early childhood, among young parents and during pregnancy.

In the 1958 Birth Cohort, BMI was associated with social class in both early life and adulthood, although there was a tendency for social differences to be greater for class of origin than concurrent social class. This suggests that strategies to prevent obesity early in life, preferably in childhood, should be prioritised. Recent BMI gain in parents was associated with

offspring BMI in childhood, which may be due to environmental or genetic influences.

Therefore, it would be beneficial to help parents to adopt lifestyle changes that can provide role models for their children and shape the environment for their children.

The MCS found socioeconomic gradients in weight gain in a contemporary cohort of children and their parents, contributing to the social patterning of obesity in children and adults. Although parental weight gain was not found to be strongly associated with faster weight gain in children from 9 months to 3 years, it was found to have a greater influence on children within 'never worked or long-term unemployed' households, suggesting an 'at risk' group who may benefit from targeted help.

Implications for research

Overall, inconsistencies in the data collected and available for analysis from the national health surveys hinder their usefulness as a tool for research and policy analysis at national levels. An assessment of the data needed to monitor trends relevant to national policy, NICE Guidance and intervention strategies would be of value.

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