**What longitudinal evidence tells us about…. Obesity**

Obesity is a major public health concern in Britain. People who are overweight or obese face a higher risk of many health problems, including cardiovascular disease, diabetes and high blood pressure[[1]](#footnote-1), as well as premature mortality[[2]](#footnote-2). Associated costs to the NHS are estimated at more than £5 billion a year, with this figure set to almost double by 2050[[3]](#footnote-3). Data from the CLOSER cohort studies have enabled researchers to track the evolution of the obesity epidemic and understand more about the predictors and prevalence both in childhood and adult life.

**Prevalence of adult obesity**

Busy lifestyles and the increasing availability of high-calorie convenience foods are having a major impact on our body size. A comparison of the 1958 National Child Development Study (NCDS) with the MRC National Survey of Health and Development (1946 cohort) found that people born in 1958 became increasingly more obese and overweight by middle age than those born in 1946[[4]](#footnote-4). There was little difference between the weight of the two cohorts in childhood, suggesting that the changes that emerged were due to diet and lifestyle in adult life.

Recent research using data from the 1970 British Cohort Study (BCS70) has shown this rising trend in obesity levels continuing among younger generations. Findings revealed that men and women born in 1970 are significantly more likely to be overweight and obese at age 42 than those born in 1958 were at the same age[[5]](#footnote-5). Sixteen per cent of both men and women in the 1958 generation were obese at age 42, compared to one in five women (20 per cent) and nearly a quarter of men (23 per cent) in their early forties today.

However, middle-aged men may have more reason to diet than women. Two thirds (68 per cent) of BCS70 men were either overweight (45 per cent) or obese (23 per cent) at age 42. In contrast, 29 per cent of women the same age were overweight and a further 20 per cent were obese.

**Predictors of adult obesity**

A 2013 study using NCDS data looked at the impact of high birth weight and not being breastfed on obesity in adult life, alongside low levels of physical activity in childhood and having at least one obese parent. Those who were identified as being at ‘high risk’ in all four categories were twice as likely to become overweight by age 23, and obese by ages 33 and 42, than their low risk peers[[6]](#footnote-6).

Another recent study based on the NCDS found that obesity is also strongly associated with social, psychological and behavioural factors, such as diet, in adulthood[[7]](#footnote-7). The researchers found that adults who had high educational qualifications and took frequent physical exercise were at a lower risk of obesity than those who did not. Personality traits were also linked to obesity, with adults who showed high levels of extraversion being more likely to carry excess weight. In contrast, those who were highly conscientious were less likely to be obese.

**Child obesity**

**Prevalence of childhood obesity**

Data from the Millennium Cohort Study (MCS) revealed that 16 per cent of UK children born in 2000-2001 were overweight by the age of 5, and a further 5 per cent were obese. Levels of overweight and obesity were highest in Northern Ireland (19 per and 7 per cent) and Wales (19 per cent and 5 per cent), while children in England were least likely to be overweight or obese (16 per cent and 5 per cent)[[8]](#footnote-8). [CONFIRM EXACT FIGURES IN BOOK]

Research based on the Avon Longitudinal Study of Parents and Children (ALSPAC) indicates that most excess weight gain occurs between ages 7 and 9, while increases in early childhood and adolescence are smaller and more gradual.[[9]](#footnote-9)

**Predictors of childhood obesity**

Analysis of the MCS has shown that levels of childhood obesity vary with gender and ethnicity. Researchers found that Black children were at the highest risk of being overweight or obese both at ages 3 (30 per cent) and 5 (36 per cent). This compares to 10 per cent of Indian children who were overweight or obese at age 3, and 19 per cent at age 5. While there was no gender difference at age 3, 23 per cent of girls were either overweight or obese by age 5, compared to 19 per cent of boys.

In addition, the risk of being overweight or obese at age 5 was linked to maternal socioeconomic status and educational qualifications, and household income. Children of single mothers, and of those who had their first baby between ages 20 and 24, or over the age of 35, were also more likely to carry excess weight.

Several research studies have looked at the association between childhood obesity and physical activity. An influential study using ALSPAC data showed that doing just 15 minutes a day of moderate exercise lowered a child’s chances of being obese by almost 50 per cent[[10]](#footnote-10). Similarly, researchers found that children in the MCS who generally travelled to and from school by car or bus at age 5 were more likely to be overweight than those who walked or cycled.

**Breastfeeding and pregnancy**

Breastfeeding has been closely linked to childhood weight. Researchers using the MCS found that children were more likely to be overweight at age 3 if they were never breastfed, and if they were introduced to solid foods before they were 4 months old. The risk of being overweight reduced significantly the longer children were breastfed for[[11]](#footnote-11).

A study of data from Southampton Women’s Survey (SWS) revealed that children whose mothers gain excessive weight during pregnancy were more likely to be overweight at birth and in early childhood[[12]](#footnote-12). They had an average of 7 per cent more fat mass at birth than children whose mothers gained an adequate amount of weight in pregnancy. At age 6, they had 10 per cent more fat mass.

Data from the SWS also indicates that vitamin D levels of mothers during pregnancy affect the weight of their offspring. Interestingly, researchers found that low vitamin D levels were associated with a lower fat mass in children at birth, but with a higher fat mass at age 6[[13]](#footnote-13).

***Studies used:***

MRC National Survey of Health and Development, 1958 National Child Development Study, 1970 British Cohort Study, Millennium Cohort Study, Avon Longitudinal Study of Parents and Children, Southampton Women’s Survey

1. [http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0070684#pone-0070684-t002](http://www.plosone.org/article/info%3Adoi/10.1371/journal.pone.0070684#pone-0070684-t002) [↑](#footnote-ref-1)
2. <http://jech.bmj.com/content/66/3/225.short> [↑](#footnote-ref-2)
3. Department of Health report 2011: Healthy Lives, Healthy People: A call to action on obesity in England (https://www.gov.uk/government/uploads/system/uploads/attachment\_data/file/213720/dh\_130487.pdf). [↑](#footnote-ref-3)
4. Li L, Hardy R, Kuh D et al. (2008) [Child-to-adult body mass index and height trajectories: a comparison of 2 British birth cohorts](http://journals.cambridge.org/download.php?file=%2FPHN%2FPHN14_01%2FS136898001000056Xa.pdf&code=b6ef6c7b9418c959b1a15cd526574854). Am J Epidemiol 168, 1008–1015 [↑](#footnote-ref-4)
5. <http://eprints.ioe.ac.uk/18085/1/CLS_ObesityPaper_WEB.pdf> [↑](#footnote-ref-5)
6. <http://jech.bmj.com/content/67/12/1032.short> [↑](#footnote-ref-6)
7. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3821861/> [↑](#footnote-ref-7)
8. [http://www.cls.ioe.ac.uk/library-media%5Cdocuments%5Cbriefing14\_web(2).pdf](http://www.cls.ioe.ac.uk/library-media%5Cdocuments%5Cbriefing14_web%282%29.pdf) [↑](#footnote-ref-8)
9. <http://pediatrics.aappublications.org/content/127/3/e730.full> [↑](#footnote-ref-9)
10. [http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0040097](http://www.plosmedicine.org/article/info%3Adoi/10.1371/journal.pmed.0040097) [↑](#footnote-ref-10)
11. [http://www.cls.ioe.ac.uk/library-media%5Cdocuments%5Cbriefing14\_web(2).pdf](http://www.cls.ioe.ac.uk/library-media%5Cdocuments%5Cbriefing14_web%282%29.pdf) [↑](#footnote-ref-11)
12. <http://ajcn.nutrition.org/content/91/6/1745.full> [↑](#footnote-ref-12)
13. <http://ajcn.nutrition.org/content/96/1/57.full> [↑](#footnote-ref-13)