Healthy Weight in the North West Population

NorthWest Public Health Observatory

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synthesis

bringing together policy, evidence and intelligence

KEY Messages

- Obesity has significant health impacts such as coronary heart disease, stroke, diabetes, impaired fertility and poor mental health. The North West shows the same growing trend and overall level of obesity as England as a whole, including similar levels of inequality across communities.
- Around one in four adults and one in six children in the North West are now obese and the most deprived populations have 1.6 to 1.8 times higher prevalence of obesity in children than the more affluent groups.
- By contrast, the likelihood that individuals (boys and adult men at least) will be overweight rather than obese is greater as affluence increases. Therefore 'unhealthy weight' (both obese and overweight) is a problem across the entire region and cannot be tackled by only targeting deprived areas.
- The National Healthy Weight Strategy and Regional Healthy Weight Framework are now being implemented to try to reverse the increasing prevalence of 'unhealthy weight'. NWPHO are supporting this through the development of a set of local indicators on healthy weight and the continued collation and analysis of PCT child height and weight data, particularly aimed at linking healthy weight measures with population segmentation tools to improve the targeting of local initiatives.
- Tackling obesity requires enormous behaviour change at a personal and family level. This change needs to be supported more broadly in communities and at a national policy level to prevent obesity through healthier diets and increased physical activity. Social marketing and other local initiatives, supported by regional and local intelligence, will be invaluable in enabling people to make these changes.
- More information is needed at the community and individual levels in order to gain a clearer picture of the variable causes of obesity and 'unhealthy weight' and to monitor weight trends accurately and target interventions appropriately.
- Currently there is limited evidence of what is effective in tackling the problem. This needs to be addressed to support World Class Commissioning of interventions that deliver a reduction in obesity. A national evidence base will be greatly welcomed but sub-regional networks and regional programmes are best placed to identify and evaluate the range of local initiatives aimed at tackling obesity.

1. INTRODUCTION

The importance of maintaining a 'healthy' weight cannot be underestimated, as being either underweight or overweight increases the risk of morbidity and mortality. Media headlines such as "Eating disorder in six-year-old"[1] and the high profile of the recent 'size zero' and 'beating the bulge' debates have increased the public's awareness of weight issues, but often with confusing messages about diet, lifestyle, weight and body image.

The factors that contribute to the growing epidemic of obesity are complex and interrelated. Tackling obesity requires change at a number of levels: individual, household, neighbourhood and the wider population. The number of overweight and obese adults in England have nearly trebled in the last 20 years, and in 2006, 24.9% of males and 25.2% of females were obese[2]. Levels in the North West were similar to the England average.

In January 2008, a cross-government strategy *Healthy Weight, Healthy Lives: a Cross-Government Strategy for England*[3] was published and initially focuses on childhood obesity. In response to this strategy, Government Office North West together with NHS North West recently produced *A North West Framework: To achieve healthy weight for children & families*[4]. This sets out the actions required at a regional level to prevent increasing obesity and to achieve a healthy weight.

Although underweight has a health impact in the North West, this *Synthesis* report focuses primarily on overweight and obesity in both adults and children. It aims to complement the regional framework by providing further information and analysis of the problem at a local level.

Measuring Healthy Weight

The most commonly used measure of adult weight is body mass index (BMI), which is defined as body mass in kilograms divided by height in metres squared. The calculation produces a figure that can be compared to various thresholds that define the weight status of an individual (Box 1). The classification applies to normal, healthy adults, but is not considered appropriate for pregnant women, individuals with certain medical conditions or for children and young people (under 18 years of age).

Box 1: Healthy and 'unhealthy' weight BMI classifications in adults

❊ Underweight	BMI below 18.5
❊ Healthy weight	BMI between 18.5 and 24.99
❊ Overweight	BMI between 25 and 29.99
❊ Obese	BMI between 30 and 39.99
❊ Morbidly obese	BMI over 40

The use of BMI as a measure of obesity has its limitations. For example, it fails to account for muscularity nor does it reveal the location of fat on the body. The National Institute for Health and Clinical Excellence (NICE) recommends that as BMI is not a direct measure of adiposity (amount of body fat), it should be interpreted with caution. The BMI classifications may also be an unsuitable measure for certain ethnic groups. Asian populations are predisposed to visceral or abdominal obesity and the health risks associated with obesity occur at a lower BMI than in European populations[5]. However, at a population level, BMI is the only measure available.

For children and young people aged under 18 years, BMI is not a fixed measurement as it varies due to their rapidly changing body composition and also between sexes. For these reasons, BMI reference charts are used which provide BMI thresholds for overweight and obesity for both sexes for every year of age. NICE recommends the use of the UK 1990 BMI growth reference standards 91st and 98th centiles (overweight and obesity respectively)[6].

An alternative system for measuring childhood obesity created by The International Obesity Task Force (IOTF) has been used to develop reference curves. In this system, the cut-off thresholds are calculated by extrapolating from the adult definitions of overweight and obese[7]. The prevalence of obesity depends upon which classification system is used. For example, the 2002 Health Survey for England (HSE)[8] showed a similar prevalence of overweight and obese amongst boys aged 2-15 years compared to the IOTF classification system and the 1990 UK growth reference standards. For girls aged 2-15 years, however, the IOTF classification system showed a higher prevalence of both overweight and obese.

Other measures of body composition related health risk include waist to hip ratio (WHR), waist circumference and skinfold thickness.

- WHR is a clinical method used to check levels of abdominal fat (central obesity) and is calculated by measuring the waist at the narrowest point and the hips at the widest point. The World Health Organization (WHO) considers a high WHR to be over 0.95 for men and over 0.80 for women[9], but other variations for cut-off thresholds have been suggested.
- Waist circumference correlates strongly with BMI and WHR. It is said to give a better prediction of visceral and total fat and of disease risks than WHR[10]. Increased waist circumference is a sign of underlying disease and is linked to problems such as insulin resistance, hypertension, Type 2 diabetes and coronary heart disease[11]. WHO has recommended sex-specific waist circumference classification ranges for different populations, and suggest that increased risk is present when the waist circumference exceeds 37 inches for men or 31.5 inches for women[9]. Different classifications have been proposed for different ethnic groups but since these have not been globally agreed, NICE currently does not recommend their use. Waist circumference is not recommended for diagnosis in children due to the lack of a clear threshold associated with morbidity outcomes[12].
- The pinch test (also known as skinfold test) uses callipers to measure skinfold thickness at various points on the body (e.g. triceps, abdomen, front thigh) that reflect total body fat. Normally these measurements are taken from the right side of the body. These readings are then assessed along with the individual's weight, gender and age to estimate the percentage of body fat. Further information about this process can be found at: www.topendsports.com/testing/tests/skinfolds.htm

2. POLICY

England

In January 2008, the Government published *Healthy Weight, Healthy Lives: A Cross-Government Strategy for England*[3]. This £372 million strategy, covering the period 2008-2011, responds to the findings of the Foresight report[13] and builds on previous public health policy to tackle obesity, as outlined in *The Health of the Nation*[14], *Saving Lives: Our Healthier Nation*[15] and *Choosing Health: Making Healthy Choices Easier*[16].

The Government has set itself the target "of being the first major country to reverse the rising tide of obesity and overweight in the population by ensuring that all individuals are able to maintain a healthy weight"[3]. The focus will initially be to tackle childhood obesity, given the evidence that obesity in childhood persists into adulthood. However, it will in time shift to encompass all ages and weight issues including underweight. The strategy brings together key sectors including local strategic partnerships,

voluntary sectors and non-government organisations (NGOs), health services, food producers and retailers and the leisure industry. The strategy covers five key policy areas (Box 2) and outlines a broad programme of activity for each.

Box 2: Five key areas of Healthy Weight, Healthy Lives: A Cross-Government Strategy for England[3]

- to promote children's health;
- to promote healthier food;
- to build physical activity into our daily lives;
- to support health at work and provide incentives more widely to promote health; and
- to provide effective treatment and support when people become overweight/obese.

The importance of tackling obesity has been given a high profile in the *2007 Comprehensive Spending Review*[17] by the inclusion of a target for obesity within Public Service Agreement (PSA) 12: Improve the health and wellbeing of children and young people. Spending Reviews set firm and fixed three year Departmental expenditure limits, and PSAs define the key improvements that the public can expect from these resources. The obesity target covers the 2008-11 period and requires the Department of Health (DH), Department for Children, Schools and Families and the Department for Culture, Media and Sport to *'Reduce the proportion of overweight and obese children to 2000 levels by 2020 in the context of tackling obesity across the population'*[18]. The target links to various other government work on improving child health such as *Every Child Matters*[19] and Opportunity for All Indicator 14: A reduction in the proportion of children aged 2 to 10 years who are obese (England)[20].

Over the past two years, public health national support teams (NSTs) have been set up to provide intensive support to those primary care trusts (PCTs) and local authorities who are struggling to achieve the public health targets included in the PSAs. A new Obesity National Support Team was established in September 2007 which will take a multi-sector approach and draw on expertise from the NHS, local government and voluntary sector.

Following recommendations by the House of Commons Health Committee[21], the DH committed to improve and develop systems for recording obesity among school age children through height and weight measurements[22]. As a result, in January 2006 the DH issued guidance to PCTs for measuring childhood obesity; specifically, recording height and weight measurements in children aged 4-5 years and 10-11 years (the National Child Measurement Programme - NCMP). The data is stored centrally on the National Child Obesity Database (NCOD).

In March 2007 the Medical Research Council (commissioned by the DH) released the report *The Healthy Living Social Marketing Initiative: A review of the evidence*[23]. This report provided a focused and informative approach to tackling obesity through changing behaviours - improving diet and increasing physical activity by "...raising awareness by motivating, empowering and enabling individuals to change"[23]. In 2007, the Government introduced a new Obesity Prevention Social Marketing programme. Over the ten years that this programme of activity is planned, there will be three different themes[24; 25]:

- 2007–2010: focusing on 2-10 year olds, their parents and carers
- 2010–2013: using the 2012 Olympics to inspire a fitter Britain
- 2013–2016: currently under negotiation

The National Obesity Observatory (www.noo.org.uk) was launched in December 2007 as part of the Association of Public Health Observatories (APHO), with the purpose of providing information and intelligence on overweight and obesity, gathering information on international best practice, and developing links with the IOTF. One of its first tasks will be to compare the strengths and weaknesses of the IOTF cut-off points for defining BMI and the UK growth reference standards, which are currently in use.

North West

The *North West Framework*: *To achieve healthy weight for children & families*[4] was launched jointly by Government Office North West and NHS North West in February 2008. This framework was advised and guided by the North West Obesity Group, and brings together the regional contributors to food and nutrition, physical activity, active travel and the built environment to specify the actions that will make a difference at the North West regional level. It reflects key principles and themes of the national *Healthy Weight, Healthy Lives*[3] strategy. The key areas for action are:

- population level: tackling the obesogenic[i] environment; food and nutrition, active travel and transport, green/open space, the built environment, sport, active recreation and play
- primary and secondary health care
- maternity, parenting and early years settings
- school settings
- targeting interventions and weight management programmes
- social marketing and influencing behaviour change
- emotional health and wellbeing.

Examples of North West programmes to tackle obesity and local initiatives are included in Boxes 3 and 4.

[i] Tending to cause obesity.

Box 3: Regional initiatives to tackle overweight and obesity

- **The North West Breastfeeding Framework for Action:** looks to improve the health of mothers and children, particularly focussing on those in deprived areas. Available at: www.nwph.net/champs/Lists/Weekly%20Bulliten/Attachments/160/NW%20Breastfeeding%20Framework%20Document.pdf
- **The North West 'Our Life' Programme:** awareness raising programme of the influence of environment on food consumption aimed at the public, decision makers, politicians and other public interest groups. For further information see: www.ourlife.org.uk
- **The North West E-Learning Package:** flexible learning to enable frontline staff to provide support and information to patients who are overweight and obese. www.nwph.net/nwtphn/default.aspx
- **The North West Food and Health Action Plan:** outlines the links between food and health, and highlights why and how specific actions to improve food and nutrition can significantly reduce ill health and health inequalities in the North West. Available at: www.nwph.net/food_health/Taskforce_Publications/Forms/DispForm.aspx?ID=12
- **The North West Framework: To achieve healthy weight for children & families:** specifies actions to tackle obesity by regional and local organisations with an interest in helping families lead healthier lifestyles. Available at: www.nwph.net/nwpho/publications/forms/dispform.aspx?ID=174
- **The North West Food and Health Task Force:** established to identify, address and improve food and health issues across the region. For further information see: www.nwph.net/food_health/default.aspx
- **The North West Physical Activity Alliance:** a strategic approach to developing a network of organisations to increase participation in physical activity involving key regional agencies. For further information see: www.nwph.net/phys/default.aspx

Box 4: Examples of local initiatives in the North West region

- **Watching Our Weight Club, Morecambe:** 12 month pilot study delivered to support individuals with learning difficulties and encourage them to eat healthily and become more physically active.
- **Bag a Bargain Fruit and Vegetable Co-operative, Wirral:** part of the Healthy Start Scheme 'Bag a Bargain', it encourages healthy eating in areas of deprivation by providing locally grown fruit and vegetables at a more affordable and thus accessible price.
- **The Burnley Food and Fitness Aimed at Lowering Obesity (BUFFALO) Project:** provided in three phases, which incorporates food education and physical activity targeting both children and parents.
- **Burnley Encouraging Exercise on Prescription (BEEP):** GP referral schemes as a form of preventative and rehabilitative health care and promoting thebenefits of physical activity.
- **Personal trainers, Liverpool:** personal trainers provided in free clinics at six Boots stores in the Liverpool area – one-to-one appointments providing health tips.

3. EVIDENCE

The causes of unhealthy weight and the effects of weight on health are extremely complex, not least because underweight is as potentially damaging as overweight or obesity. Here we have summarised the evidence relating to some of the problems, determinants and interventions to tackle the problem and have provided as many references to the wide range of sources as possible.

The Scale of the Problem

The National Audit Office defines obesity as "a condition in which weight gain has reached the point of seriously endangering health"[26]. In most countries, obesity has breached the 15% critical threshold set by WHO for epidemics needing intervention[27], with an estimated one billion people in the world now overweight, including 300 million obese individuals[28]. In 2004, England had the highest levels of overweight and obese among adults aged 16 years and over compared to 26 European Union countries (http://epp.eurostat.ec.europa.eu). In England alone, nearly one quarter of men and women are now obese[2] and future estimations suggest that in the UK 60% of adult males, 50% of females and 25% of children will be obese by the year 2050[13].

In the UK and Europe, childhood obesity has been increasing rapidly since the late 1980s. It is now the most common disorder of childhood and adolescence[29] and has been linked to obesity in adulthood[30]. The 'conveyor belt' effect[3] where obesity in childhood persists into adulthood is a cause for concern. Currently, it is likely that at least 60% of obese children and 70-80% of obese adolescents will go on to become obese adults[29]. Obese adults who were overweight as adolescents have greater levels of weight-related ill health and are at higher risk of early mortality than adults who become obese in adulthood[29;31].

Impact of 'Unhealthy' Weight

Fat has many important roles in the body such as protecting vital organs and hormone production. However, excessive fat accumulation in adipose tissue is damaging to health. Being overweight or obese increases the risk of a range of diseases that can have a significant health impact on individuals (Box 5a). The risks rise with increasing BMI and are therefore greater for the obese. Those who are severely obese[ii] can expect an average decreased life expectancy of 11 years[32].

Obesity places a significant burden on the National Health Service (NHS). Direct costs are approximately £4.2 billion a year and the Foresight Report[13] predicts that these will more than double by 2050. It also has an impact on society and the wider economy through sickness absence and reduced productivity, with these indirect costs estimated to be around £16 billion. Obese people may also be subject to discrimination and prejudice, such as in employment[33]. These intangible costs are difficult to measure but are nevertheless important.

There are also significant physical and mental health effects of underweight, malnutrition, thinness, and fluctuating weight (Box 5b).

[ii] In research conducted by Fontaine et al, the severely obese were classed as persons with a BMI greater than 45. This therefore differs from the classification given in Box 1.

Box 5a: Health effects of obesity

Physical
✻ Asthma
✻ Back pain
✻ Breathlessness
✻ Cancer – approximately 10% of all cancer deaths among non-smokers are related to obesity
✻ Coronary heart disease (CHD) – the risk of coronary artery disease increases 3.6 times for each unit increase in BMI
✻ Diabetes (Type 2) – risk of developing is estimated to be 20 times greater with people who have a BMI over 35, compared to those with a BMI between 18 and 25
✻ Dyslipidemia
✻ Gallbladder disease
✻ Gout
✻ High blood pressure (hypertension) – 85% is associated with a BMI greater than 25
✻ Loss of sight from conditions such as age related macular degeneration (AMD), diabetic retinopathy, glaucoma and cataracts
✻ Non-alcoholic fatty liver disease – approximately 90% of obese individuals have a fatty liver
✻ Non-Hodgkin's lymphoma
✻ Osteoarthritis
✻ Pancreatitis
✻ Phlebitis (inflammation of a vein)
✻ Pulmonary disease
✻ Skin conditions
✻ Sleep apnoea
✻ Stroke
Psychological
✻ Tiredness
✻ Depression
✻ Low self-esteem
Sexual/Reproductive
✻ Complications in pregnancy (e.g. pre-eclampsia, foetal defects)
✻ Reproductive problems i.e. impaired fertility

Box 5b: Health effects of underweight

Physical
✻ Thinning hair
✻ Enamel teeth erosions
✻ Hypothermia
✻ Constipation
✻ Insensitivity to pain
✻ Fatigue/lethargy
✻ Decreased muscle strength
✻ Compromised immune system
✻ Impact upon internal organs (organ failure)
✻ Fall in metabolic rate
✻ Lowering of pulse rate and arterial blood pressure
✻ Cardiovascular disease
✻ Increased risk of mortality
✻ Severe diarrhoea and fatal dehydration (in cases of severe underweight/under nutrition)
Psychological
✻ Anxiety
✻ Depression
✻ Self-neglect
Sexual/Reproductive
✻ Shrunken breasts
✻ Lack of periods
✻ Miscarriage
✻ Infertility
✻ Pregnancy complications

Causes of Excess Weight

Attempting to explain the cause of obesity is not as straightforward as simply saying that it results from the consumption of more calories than are burnt off through physical activity. The causes are far more complex than this. The structure of modern society with its abundance of energy dense food, motorised transport and sedentary lifestyles has been described as an 'obesogenic environment', encouraging behaviour that increases the risk of obesity[34]. Obesity results from complex interactions between genes, behaviour and the environment. Examining the contributing factors in isolation is meaningless as each factor alone may only make a small contribution to weight gain, but may have significant impact when combined with other factors[23] (Box 6).

Box 6: Risk factors for excess weight

Breastfeeding

Breastfeeding has a number of health benefits and its effect on obesity has been the subject of much research and debate. Findings from a recent meta-analysis strongly supports a dose-dependent relationship between longer duration of breastfeeding and decrease in the child's risk of becoming overweight[36]. The Health Development Agency report *Interventions on Obesity*[37] states that "encouraging breastfeeding is essential" and a recent study in America[38] found that children who were breastfed during their first year of life were less likely to become obese in later life, regardless of whether their mother was overweight or diabetic.

Ethnicity

Certain ethnic groups experience higher levels of obesity, in particular Black Caribbean and Pakistani women in the UK. The 1999 survey *Health of Minority Ethnic Groups*[39] revealed that South Asian and Chinese people were much less likely to participate in physical activities, whilst Bangladeshi people had the lowest physical activity levels. School children from non-White backgrounds living in westernised societies are also more likely to become obese than White children[40].

Pregnancy

Becoming pregnant can in itself lead to obesity. Research has shown that one year post-partum a woman's mean weight gain is 1.5 to 5.9kg, with weight gain more likely in low income groups[41]. There are a number of risks associated with maternal obesity, including increased risk of miscarriage, operative delivery, pre-eclampsia and thromboembolism. The foetus is also at risk, with a greater risk of perinatal mortality and high birth weight[41].

Smoking cessation

Weight gain is often a concern for individuals giving up smoking. Nicotine is a metabolic stimulant and heavy smokers can therefore have greater energy expenditure than non-smokers[42]. Tobacco may also affect appetite due to its effect on taste and smell. A study in America found that smoking cessation led to a mean weight gain of 2.8kg in men and 3.8kg in women[43].

Socio-economic status

The links between obesity and poverty are well known. Although obesity is increasing across all social classes, the prevalence of obesity is highest in those of lower socio-economic status, particularly females[44].

Three major factors likely to be responsible for the growing obesity trend are diet, physical activity and family history.

Diet

In recent decades, there have been considerable changes in global eating habits and food availability has risen over time[34]. To maintain her weight a woman needs to consume around 2,000 calories a day whilst a man needs approximately 2,500. The number of calories available per person per day (based upon food produced/available per head) was an estimated 2,300 in 1961, rising to 2,800 in 1998 and is predicted to exceed 3,000 by around 2015[34].

Competition and technological advances in the food industry have enabled more food to be produced more cheaply. The growth of processed foods high in sugar, fat and salt in response to consumer demand has led to increased consumption of energy dense foods that are nutritionally inadequate. It is widely recognised that these should be the smallest proportion of a healthy balanced diet[3]. Meanwhile, relative consumption of fruit and vegetables has fallen[2]. The daily recommended intake of fruit and vegetables is five portions per day[35] and this level of consumption has a number of health benefits. However:

- Findings from the 2004 *National Diet and Nutrition Survey*[44] showed that in Great Britain, adults aged 19-64 on average consumed less than three portions of fruit and vegetables a day. In 2006, 28% of men and 32% of women (aged 16 and over) ate five or more portions of fruit and vegetables, while among children, 19% of boys and 22% of girls ate five or more portions[2].
- There are socio-economic differences in fruit and vegetable consumption. Within the managerial and professional occupation groups, 27% of men and 33% of women reported eating the recommended five portions per day. Only 16% of men and 17% of women in routine and semi-routine occupations met this target[8].

It is also possible that increasing levels of alcohol consumption may be contributing to the rise in obesity in adults. Alcohol has no nutritional benefit, is highly calorific and encourages fat storage[46], as well as affecting the activity and absorption of nutrients[47]. Although much publicity is given to the risks of binge drinking, little mention is given to the high calorific value of alcoholic beverages. At present, there is a lack of robust research into the relationship between alcohol and adiposity, with studies showing inconsistent findings. A new report on the relationship between food and alcohol (produced by the Centre for Public Health) is due for publication later this year and will be available online at: www.cph.org.uk/publications.aspx

Physical activity

Reduced access to recreation and exercise may be a causal factor in rising obesity. A recent report by the Royal Commission on Environmental Pollution[48] highlighted the impact of new technology and modern urban systems discouraging individuals to take up physical activity. Increased use of cars and a decline in the use of public transport, cycling and walking and the value placed on labour saving gadgets all contribute to inactivity. Children spend less time now playing outside, choosing more sedentary indoor activities such as watching TV, playing computer games, using the internet and mobile phones. In addition, there is less physical education and sport at school[25].

A lack of physical activity is estimated to contribute to 22-33% of coronary heart disease, 15% of diabetes, 12-13% of stroke, 16-17% of colon cancer and 11% of breast cancer in developed countries[49]. The Chief Medical Officer's recommended level of physical activity for adults is 30 minutes of moderate activity on at least five days a week, and for children and young people it is one hour of moderate activity every day[50]. In England, the levels of physical activity are low; the 2006 HSE found that only 40%

of men and 28% of women met the recommended weekly physical activity target[2]. For children, 70% of boys and 61% of girls met the recommended physical activity levels. Physical inactivity is said to cost the Government an estimated £8.2 billion annually, and it has been suggested that a 10% rise in adult physical activity could save an estimated 6,000 lives with cost savings of approximately £500 million per year (of which 17% is directly attributable to health care costs)[49]. Physical activity also varies by socio-economic classification, with, for example, rates of walking two-thirds higher in professional classes than in unskilled manual groups[51;52].

At this time, the UK has no national surveillance system for monitoring trends in overall physical activity. Questions in large scale surveys such as the HSE have altered over time thus limiting the opportunity to monitor trends. We are reliant on the HSE, the Annual Survey of Participation in Sport and Culture and the National Travel Survey announced in *Choosing Activity: a physical activity action plan*[50] for physical activity data.

Family history

Weight is influenced by genetics and is the second most inheritable body feature after height. Genetic makeup may influence obesity due to its links with metabolism and behaviour. In addition, a very small number of genetic defects lead to obesity[53]. A recent twin study[54] looked at the extent to which genes make individuals more susceptible to a high BMI and large waist size. The study found that genes accounted for approximately 60% of BMI and independent genetic influences for 40% of waist size (77% of BMI and waist size combined). Despite these findings, it is a commonly held view that the increase in overweight and obese has occurred so rapidly and within such a short time period, that genetic changes are unlikely to be a major factor.

Currently the primary indicator that a child will become obese is that both parents are overweight or obese[55]. Children with one obese parent have an obesity prevalence of approximately 20-40%, doubling to around 80% for those with two obese parents[40]. The reasons for this are not fully understood although it is likely to be due to a combination of genetics, lifestyle and environment.

Causes of Underweight

An individual may become underweight for a number of reasons such as fast metabolism, malnutrition, chronic conditions resulting in weight loss, hyperthyroidism, drug use or psychological problems (e.g. anorexia, bulimia, body dysmorphic disorder, stress or anxiety). In the majority of cases, an increase in calorific intake is required to ensure that more calories are consumed than are being used.

Like obesity, the causes of weight loss can be complex, involving interactions between various physical, psychosocial and environmental factors. For example, eating alone, social isolation, accessibility to shops and affordability of food, reduced appetite due to illness, significant life changes and mental illness have all been found to be associated with weight loss[56-59]. There is also a relationship between alcohol and underweight, with heavy drinking linked to increased risk of malnutrition due to, for example, nausea, or spending money on alcohol rather than food[60].

Eating Disorders

Eating disorders can cause serious physical and psychological damage and often occur when people use food as a way of coping with emotional issues. The food itself is usually not the issue. It is the use of eating or starving as a coping mechanism that leads to problems. The most common eating disorders are[61]:

- anorexia nervosa – limiting calorific intake and in some cases taking excessive exercise
- bulimia nervosa – cycles of bingeing on large amounts of food then vomiting to purge the system
- binge eating disorder – eating large amounts of food in a short period of time
- compulsive over-eating – 'picking' at food throughout the day.

While eating disorders are up to ten times more common in females than males, there have been increases in the number of boys and young men developing eating disorders in recent years. Eating disorders commonly start in the teenage years, thus being more prevalent in young people[62]. A study of eating disorders amongst children by the British Paediatric Surveillance Unit revealed that in the UK, an estimated 3.5 in every 100,000 children are treated for an eating disorder (including anorexia, bulimia and binge eating disorder) every year[1]. There is also evidence that childhood or parental obesity is a risk factor for the development of bulimia nervosa but not anorexia nervosa[63].

Obesity and Deprivation

It has been suggested that obesity reflects and compounds inequalities[34]. In most countries of the European Region, obesity is more prevalent amongst socially deprived communities, characterised by lower income, poor education and inadequate access to care. This has also been supported in the findings of the recent Millennium Cohort study of almost 14,000 children in the UK, which found further evidence that children starting out in disadvantaged areas are more likely to be overweight or obese[64]. There is also a tendency for obesity prevalence to increase as area deprivation increases, with evidence that this relationship also increases with the age of the child.

Effective Interventions

Currently, work to tackle overweight and obesity tends to fall into two categories of intervention: those aimed at preventing overweight developing from childhood onwards; and those aimed at weight reduction/control in those who are overweight or obese[65].

The National Institute for Health and Clinical Excellence (NICE) have published a number of guidance documents that are a useful starting point for health professionals to utilise when thinking about appropriate interventions.

- The first national guidance on overweight and obese in adults and children (aged two years and over) in England and Wales was published in December 2006[66]. This guidance supports *Choosing Health*[16] and details the vital roles that the NHS, schools and early years providers, local authorities, employers and town planners have in preventing the rising trend of obesity in the UK. They also set out guidance for individuals to follow to maintain a healthy weight.
- In March 2008, guidance on maternal and child nutrition to improve the nutrition of pregnant and breastfeeding mothers and children living in low income households was published (aimed at midwives, health visitors, pharmacists and other primary care services)[67]. This includes guidance on the management of obesity in pregnant and post-partum women.
- Public health programme guidance on the promotion and creation of physical environments that support increased levels of physical activity was published in January 2008[68].
- Intervention guidance on workplace physical activity was published in May 2008[69], whilst guidance on the promotion of physical activity in children is due for publication in January 2009.
- NICE also produced guidelines for the identification, treatment and management of anorexia nervosa, bulimia nervosa and related eating disorders in 2004[61].

The UK Foresight Project aims to produce a long-term vision of how a sustainable response to the prevalence of obesity in the UK can be delivered over the next 40 years. The Foresight report[13] highlighted that, although a wide range of evidence relating to obesity exists, the majority focus on the causes rather than prevention or treatment strategies. Systematic reviews of interventions around the world have identified little work that shows direct effect on obesity prevalence or BMI[66] nor the usefulness or cost effectiveness of large scale public health interventions to prevent and treat obesity[70] However, there are some encouraging early results emerging from a few international studies (Box 7).

Box 7: Examples of international studies to prevent and treat obesity

- **The Fleurbaix-Laventie Ville Sante programme** in France aims to prevent an increase in childhood obesity through a five year intervention plan (www.flvs.fr).
- **Shape up Somerville: Eat Smart. Play Hard:** an American community based intervention promoting healthy eating options and physical activity among primary school aged children in Somerville, Massachusetts. Early results indicated a decrease in BMI z-score among children at high risk of obesity who participated in the project[54].

Investigations by the Office of Communications (Ofcom)[iii] surrounding the role of television advertising in children's food consumption began in 2004. The findings concluded that "television advertising had a modest, direct effect on children's food choices and a larger but unquantifiable indirect effect on children's food preferences, consumption and behaviour" (www.ofcom.org.uk/media/mofaq/bdc/foodadfaq). A recent study by the University of Liverpool found a strong link between weight and inclination to overeat when exposed to food adverts on TV. The study of 60 children aged 9-11 years revealed that levels of food intake rose dramatically following viewing of TV food advertisements. Among obese children, food intake rose by 134%[71].

New restrictions on junk food advertising on television came into effect in January 2007 and follow a strict timescale. By 1 January 2009, all advertisements for foods high in fat, salt or sugar (HFSS) will have to be removed. This will be assessed according to the Food Standards Agency Nutrient Profiling model.

4. INTELLIGENCE

Adults

Trends in adult obesity in England

Health Survey for England (HSE) data highlighted that over the period 1993 to 2006, the prevalence of obesity in England rose from 13.2% to 24.9% in males, and from 16.4% to 25.2% in females[2]. The prevalence of morbid obesity rose seven fold in males from 0.2% to 1.4% and nearly doubled in females, from 1.4% to 2.7%. In the same period, the prevalence of underweight decreased from 1.4% to 0.9% in males, while females remained the same at 1.9%. The prevalence of normal weight decreased from 41.0% to 29.5% in males and from 49.5% to 40.1% in females[iv].

Further national trend data from the HSE for 1993-2006 by weight category (underweight, normal, overweight, obese, morbidly obese and overweight including obese), age group (16-24, 25-34, 35-44, 45-54, 55-64, 65-74 and 75+) and gender are available at: www.ic.nhs.uk/statistics-and-data-collections/healthand-lifestyles-related-surveys/health-survey-for-england/health-survey-for-england-2006-latest-trends

[iii] Ofcom is the independant regulator and competition authority for the UK communications industries (television, radio, telecommunications and wireless communications services) www.ofcom.org.uk

[iv] Data from 1993-2006 is unweighted data.

Trends in obesity show little variation across different parts of England and there are significant increases in the prevalence of adult male and female obesity over time across virtually all areas (Figure 1). Thus, in 2003-05 very few areas had obesity levels below 18% whereas in 1994-96 hardly any areas had obesity levels greater than 18%.

Maps illustrating trends in overweight and obesity (as well as other health and lifestyle indicators) from HSE data over time, by 2002 strategic heath authority (SHA) area are available from the NWPHO Health and Lifestyle Trends (HALT) in England online tool (www.nwph.net/lifestyles)

Figure 1: Trends in age standardised prevalence of obesity for adults (aged 16 years and over) in England*, 1994/96 to 2003/05: a) males and b) females.

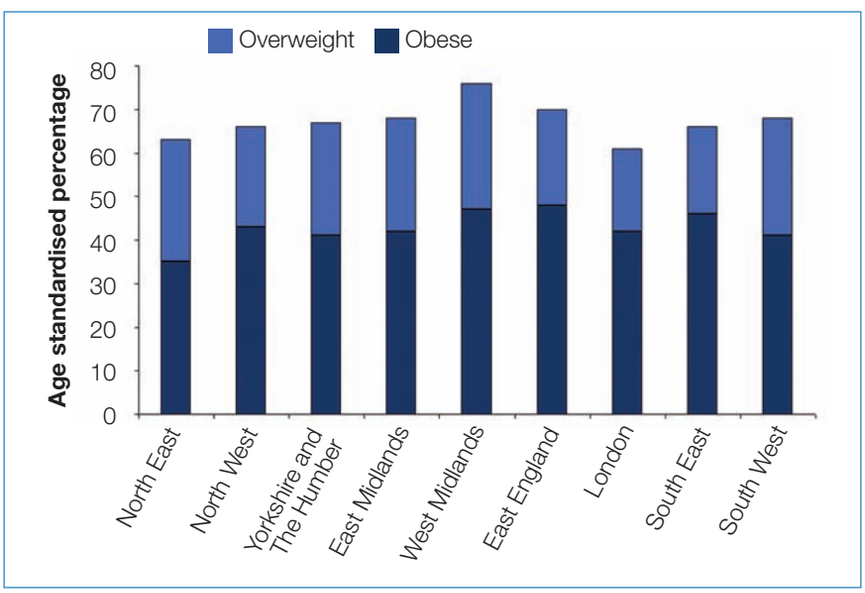
Source: North West Public Health Observatory from Health Survey for England.
* Maps show 2002 strategic heath authority (SHA) area with all years compared using the same scale.

North West Region

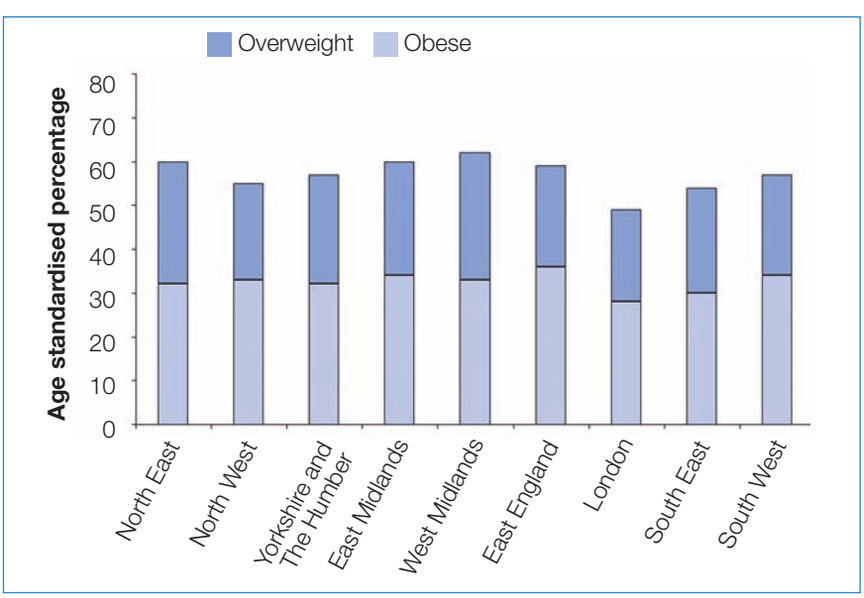
Similar to other regions in England, in the North West there was little difference between the percentage of men and women aged 16 years and over who were obese in 2006, at 23% and 22% respectively (Figure 2). However, more men than women are overweight, such that in the North West 66% of males are of unhealthy weight (overweight or obese) compared with 55% of females.

Figure 2: Prevalence of overweight and obese in adults (aged 16 years and over) with valid BMI, 2006.

a) males



b) females

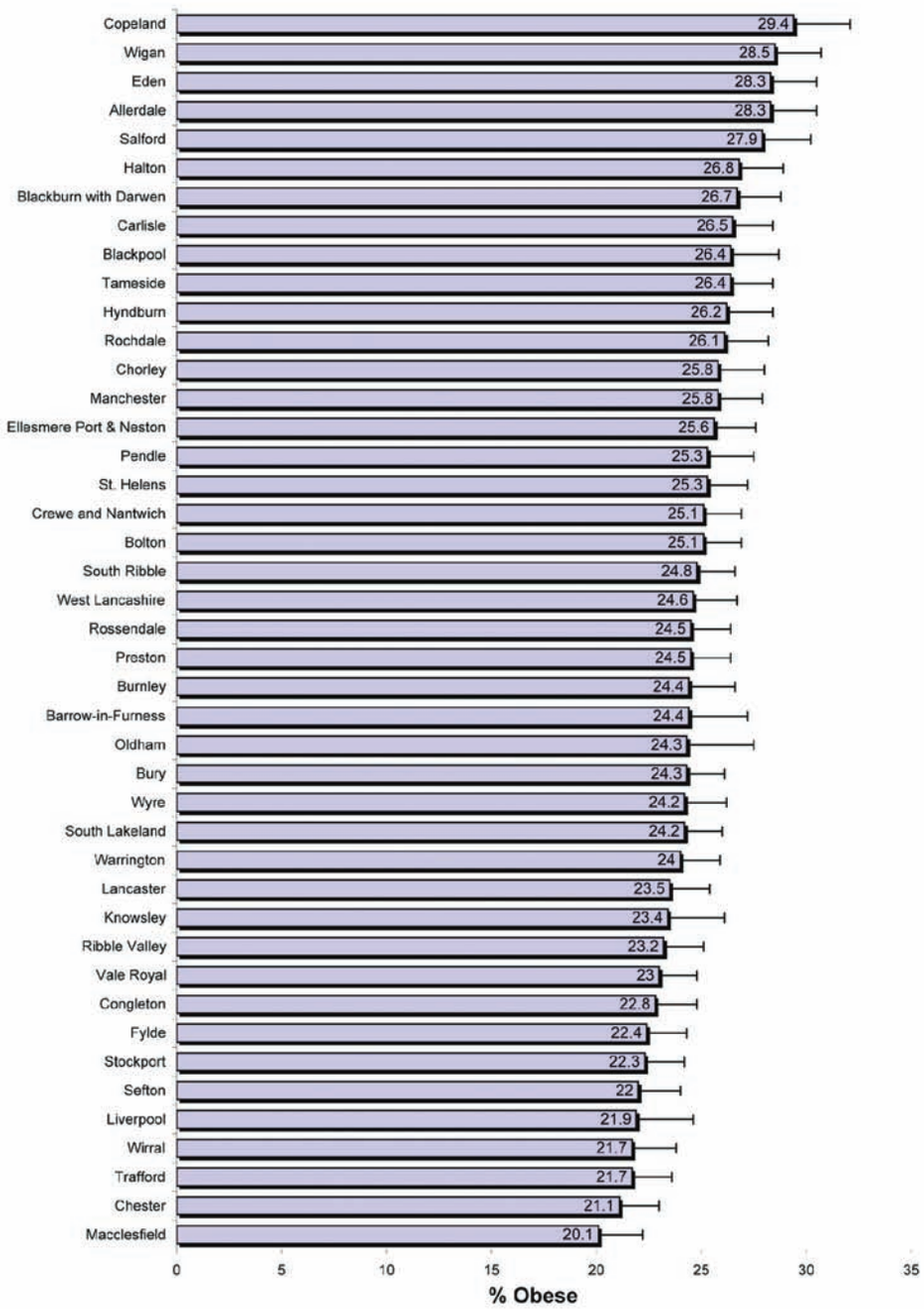


Source: Health Survey for England, 2006. The Information Centre.

Modelled estimates of adult obesity (2003-05) revealed that the local authorities in the North West with the highest estimated prevalence were Copeland (29.4%), Wigan (28.5%) and Eden (28.3%), compared to a national measure of 23.6% (Figure 3a). The local authorities with the lowest estimated prevalence were Macclesfield (20.1%), Chester (21.1%), Trafford and Wirral (both 21.7%). These

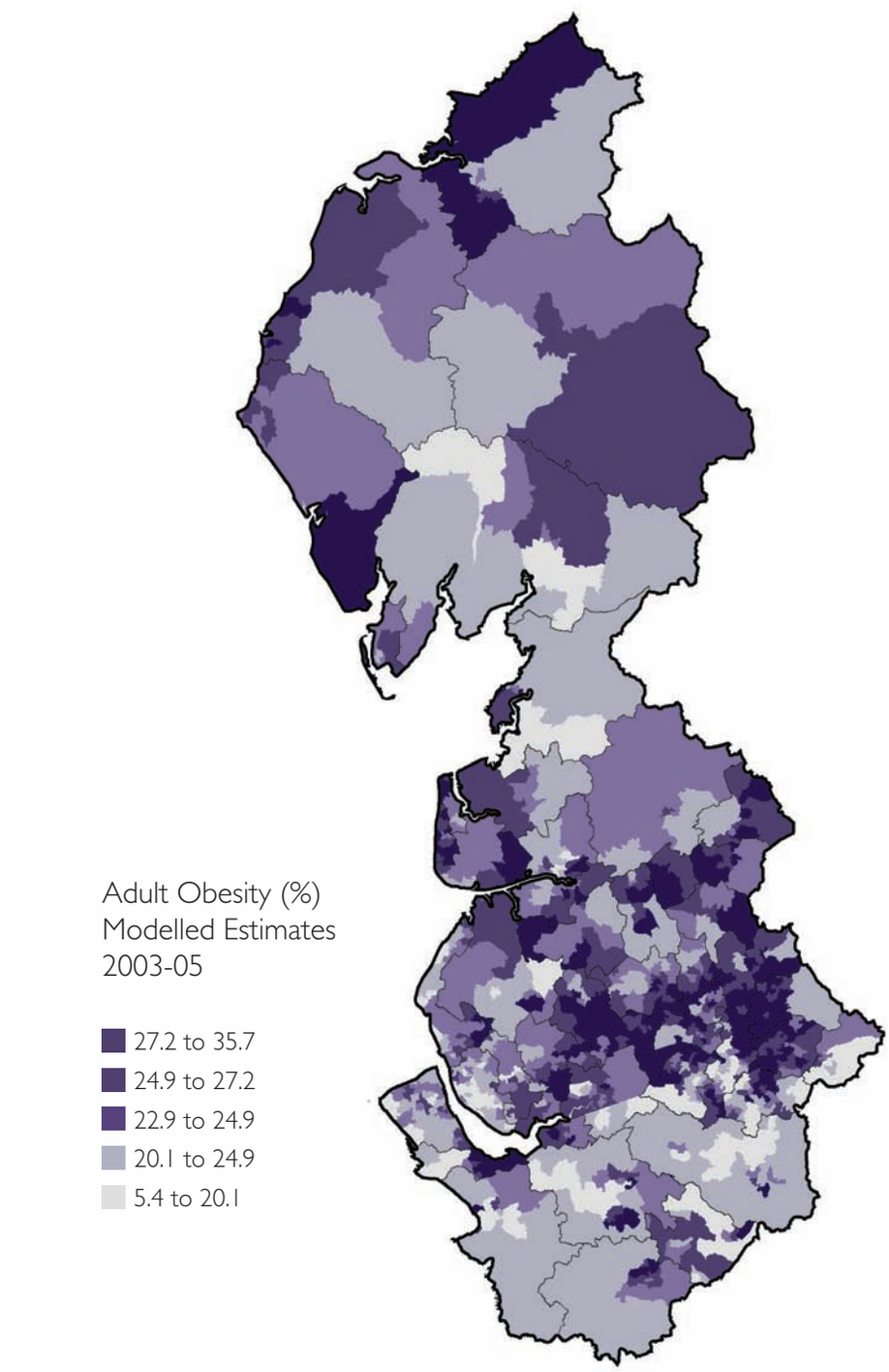
estimates also predict local patterns of adult obesity (at Middle Super Output Area), which enables organisations to target relevant local populations (Figure 3b).

Figure 3a: Modelled estimates of obesity prevalence in adults (aged 16+ years) for 2003-2005 in the North West region by local authority.



Source: Health Survey for England, 2006. The Information Centre.

Figure 3b: Modelled estimates of obesity prevalence in adults (aged 16+ years) for 2003-2005 in the North West region by Middle Super Output Area.



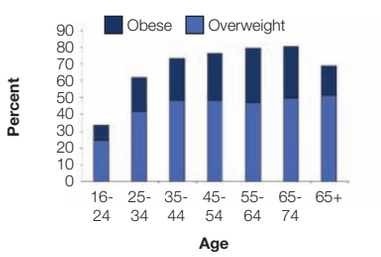
Source: NWPHO from Health Survey for England.

National survey data show that there is an increasing prevalence of unhealthy weight with age, such that by the time people are aged 55-64, 80% of males and 66% of females are overweight or obese (Figures 4a and 4b).

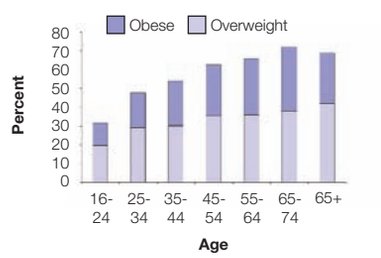
The Health Survey for England 2006 presents BMI data by equivalised household income[v] and gender for adults aged 16 years and over. There is no regional breakdown, but the data for England shows a much stronger relationship with income and obesity in women than in men (Figure 4). For women with the lowest income quintile, obesity (32%) is 1.7 times greater than those with the highest income (19%). For men, obesity is highest in the fourth lowest income quintile (27%) and is 1.3 times greater than those with the highest income (21%). Also, women show a declining level of normal ('healthy') weight as income increases but men show a declining overweight with increasing income. More data relating weight with equivalised household income is available at: www.ic.nhs.uk/statistics-and-data-collections/healthand-lifestyles-related-surveys/health-survey-for-england/health-survey-for-england-2006:-cvd-and-risk-factors-adults-obesity-and-risk-factors-children.

Figures 4a-c: BMI group for adults (aged 16 years and over) by age group and equivalised income quintile. England, 2006.

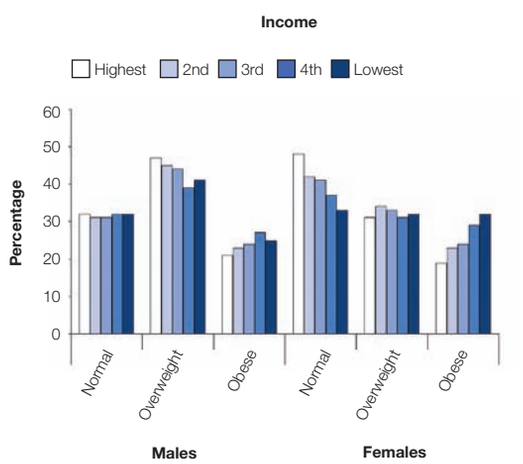
a) age group males



b) age group females



c) by equivalised income quintile (males and females)



Source: Health Survey for England, 2006. The Information Centre.

Food and nutrition

Results from the *Family Food in 2005/06 report*[72] indicated that, compared to other regions, households in the North West had the:

- second lowest household purchases of vegetables (excluding potatoes), with the North East being lowest; and
- highest expenditure on alcoholic drinks (including both household and eating out).

This report also showed encouraging signs of a shift toward purchasing fruit and vegetables and away from confectionery products. In the UK between 2004/05 and 2005/06 there was a 7.7% increase in the household purchases of fruit and vegetables and a 6.1% fall in purchases of confectionery. A similar pattern was also seen in the North West region.

Further details of the Expenditure and Food Surveys and the related Family Food reports are available from www.statistics.defra.gov.uk

[v] Equivalised income is household income which is adjusted by using an equivalence scale to take into account the size and composition of the household.

Future overweight and obese prevalence in adults

The Foresight report[13] projects that, based on current trends, by 2015 36% of males and 28% of females in England will be obese, and by 2050, 60% of males and 50% of females will be obese. This prevalence is set to differ according to age and socio-economic status.

Children

Prevalence of overweight and obese in England

The most recent data investigating childhood weight is the National Child Monitoring Programme (NCMP). This programme was established in 2005 and weighs and measures children in Reception (aged 4 to 5 years) and Year 6 (aged 10 to 11 years) to assess levels of overweight and obese.

In the 2006/07[vi] school year, a total of 876,416 primary school children in England were measured (80% of those who were eligible), of whom 120,044 were obese and 239,213 were overweight or obese. The total figure included 119,903 children from the North West region, of whom 16,343 were obese and 33,045 were overweight or obese.

The data shows that in England, the prevalence of obesity was significantly higher in boys than girls in both age groups and was significantly higher in Year 6 compared to Reception (Table 1). A rural/urban split was also evident with higher obesity prevalence in urban areas compared to rural areas, although the interrelationship between obesity in urban and rural areas needs further investigation.

Further details of the NCMP can be found at www.ncmp.ic.nhs.uk

Table 1: NCMP child measurement. England and North West SHA, 2006/07.

	England		North West	
	Obese	Overweight & Obese	Obese	Overweight & Obese[vii]
Reception	9.9%	22.9%	10.2%	24.0%
Year 6	17.5%	31.6%	17.3%	31.4%

Source: National Childhood Measurement Programme, The Information Centre

The 2006 HSE also explored the prevalence of obesity and overweight in children up to the age of 15 years by Government Office Region. In England, there was a higher prevalence of obese, and overweight and obese boys compared to girls. However, the percentage of overweight girls was higher than boys.

On the whole, most of the figures in the NCMP and the 2006 HSE are similar, with the exception of obesity prevalence for boys in Reception. Differences here could be explained by survey design and analytical techniques applied to each study.

[vi] It is not possible to compare 2005/06 data with 2006/07 due to the low response rate in 2005/06 of 48%.

[vii] North West SHA overweight and obese figures were derived by adding together reported percentage obese and percentage overweight: Reception: 10.2% (obese) + 13.8% (overweight) = 24.0%; Year 6: 17.3% (obese) + 14.1% (overweight) = 31.4%.

Prevalence of overweight and obese in the North West

The North West Public Health Observatory (NWPHO) have collated child height and weight data from regional PCTs since measurements began to provide additional analysis not available nationally. In 2007 all North West PCTs contributed data, with a total sample of 62,046 Reception children and 58,068 Year 6 children being measured[viii].

The prevalence of obesity in Reception year children in the North West in 2006/07 was the same as the England average (10%), but there was a higher prevalence of overweight (13.7% for North West compared to 12.8% for England). For Year 6, the North West prevalence of obesity (17.4%) and overweight (13.4%) was similar to that for England (17.3% and 13.8%). Overall in the North West:

- one in ten Reception year children (aged 4-5) are obese and one in four are of unhealthy weight (overweight or obese); and
- one in six Year 6 children (aged 10-11) are obese and one in three are of unhealthy weight (overweight or obese).

The prevalence of obesity in the North West for boys and girls in Reception was 11.0% and 9.4% respectively, while for boys and girls in Year 6 it was 18.9% and 15.6% (Table 2). Across local areas, the prevalence of obesity in Reception year ranged from 6.1% in South Lakeland to 17.2% in Ellesmere Port and Neston for boys; and from 4.6% in South Lakeland to 13.1% in Knowsley for girls. In Year 6, the prevalence of obesity ranged from 11.5% in Rossendale to 26.0% in Ellesmere Port and Neston for boys; and from 8.3% in Chorley to 21.6% in Manchester for girls (Table 2).

[viii] These figures do not include the area of High Peak. When High Peak is included the total sample figures are 62,322 (Reception) and 58,252 (Year 6).

Table 2: Percentage of obese children in Reception and Year 6. North West local authorities, 2006/07.

	Reception Obese %		Year 6 Obese %	
Local Authority	**Males**	**Females**	**Males**	**Females**
Allerdale	13.7	10.7	19.8	14.1
Barrow-in-Furness	9.9	9.3	16.0	16.9
Blackburn with Darwen	11.0	8.5	18.1	13.4
Blackpool	11.6	9.5	17.0	15.0
Bolton	10.9	10.4	18.0	17.9
Burnley	13.8	10.0	12.2	13.2
Bury	10.6	9.1	18.1	13.3
Carlisle	14.0	9.6	16.0	12.2
Chester	7.9	6.1	15.6	15.7
Chorley	10.1	8.4	14.8	8.3
Congleton	7.1	5.3	17.0	14.6
Copeland	12.2	10.2	23.9	18.0
Crewe and Nantwich	11.1	5.5	22.7	17.7
Eden	11.5	8.4	20.8	13.5
Ellesmere Port and Neston	**17.2**	12.2	**26.0**	20.4
Fylde	9.2	6.6	17.0	8.7
Halton	10.1	13.0	23.3	20.2
Hyndburn	9.0	8.3	17.8	11.5
Knowsley	13.7	**13.1**	20.4	17.3
Lancaster	9.8	10.0	13.0	8.6
Liverpool	11.0	10.2	20.7	14.8
Macclesfield	10.4	9.6	16.3	11.3
Manchester	12.5	10.4	23.9	**21.6**
Oldham	9.2	9.6	17.6	14.7
Pendle	10.8	11.5	15.8	9.9
Preston	11.6	8.0	17.8	16.0
Ribble Valley	9.1	6.6	18.0	13.8
Rochdale	12.8	10.9	18.8	14.4
Rossendale	10.6	9.5	11.5	12.6
Salford	11.3	11.7	20.5	21.3
Sefton	12.0	11.2	20.7	15.9
South Lakeland	6.1	4.6	12.1	10.5
South Ribble	10.9	8.3	14.2	10.2
St. Helens	15.5	12.3	22.8	19.7
Stockport	8.0	6.0	16.1	11.7
Tameside	10.3	8.9	18.2	12.3
Trafford	12.1	8.8	17.2	15.6
Vale Royal	8.2	6.3	18.4	14.6
Warrington	11.4	8.0	16.9	14.6
West Lancashire	13.2	9.8	14.3	11.0
Wigan	10.1	10.5	17.5	16.9
Wirral	9.8	8.4	20.8	17.9
Wyre	8.5	5.1	16.6	13.1
North West	11.0	9.4	18.9	15.6
Number of children measured	31,803	30,243	29,623	28,445
Number of obese children	3,486	2,857	5,594	4,450

Red indicates area with the highest prevalence

Source: North West Public Health Observatory

Table 3: Percentage of overweight and obese children in Reception and Year 6. North West local authorities, 2006/07.

	Reception Overweight & Obese %		Year 6 Overweight & Obese %	
Local Authority	**Males**	**Females**	**Males**	**Females**
Allerdale	29.2	23.7	32.7	25.0
Barrow-in-Furness	24.3	22.8	31.2	30.1
Blackburn with Darwen	24.6	19.7	32.7	28.4
Blackpool	25.2	22.1	29.4	26.6
Bolton	25.4	22.2	32.5	31.6
Burnley	27.8	24.9	22.7	28.6
Bury	23.2	22.4	32.3	26.9
Carlisle	28.0	23.5	29.9	24.0
Chester	16.3	19.4	27.8	31.0
Chorley	32.3	23.6	27.1	22.0
Congleton	22.6	15.2	29.4	31.3
Copeland	29.8	25.5	33.6	32.3
Crewe and Nantwich	22.5	18.0	**39.6**	31.4
Eden	23.7	21.4	33.3	26.9
Ellesmere Port and Neston	32.5	26.2	37.5	**38.8**
Fylde	25.8	20.5	33.6	27.5
Halton	24.3	24.5	36.3	35.1
Hyndburn	20.2	22.1	31.2	25.5
Knowsley	31.8	28.1	34.7	34.5
Lancaster	20.9	21.2	28.3	21.5
Liverpool	24.6	21.8	35.6	28.7
Macclesfield	26.0	24.7	31.3	24.8
Manchester	25.4	23.4	38.9	36.0
Oldham	21.7	19.9	31.5	28.1
Pendle	23.0	21.4	30.1	21.8
Preston	25.2	25.1	31.0	27.4
Ribble Valley	24.8	19.2	30.9	24.1
Rochdale	26.8	25.6	32.7	27.7
Rossendale	30.4	23.0	26.1	28.3
Salford	25.8	25.5	35.3	36.4
Sefton	28.0	26.5	35.4	29.6
South Lakeland	16.4	14.1	24.8	27.6
South Ribble	27.4	23.7	27.6	23.6
St. Helens	**34.7**	**31.7**	38.4	36.5
Stockport	18.8	16.5	27.9	23.8
Tameside	23.7	24.2	31.1	26.9
Trafford	27.2	23.4	31.3	30.7
Vale Royal	20.6	17.0	33.6	29.7
Warrington	26.1	20.2	31.5	27.2
West Lancashire	33.7	24.5	26.9	22.1
Wigan	26.3	25.3	32.0	30.0
Wirral	24.3	22.1	35.7	33.4
Wyre	19.6	18.2	27.5	25.0
North West	25.2	22.6	33.0	29.8
Number of children measured	31,803	30,243	29,623	28,445
Number of overweight & obese children	8,019	6,850	9,779	8,469

Red indicates area with the highest prevalence

Source: North West Public Health Observatory

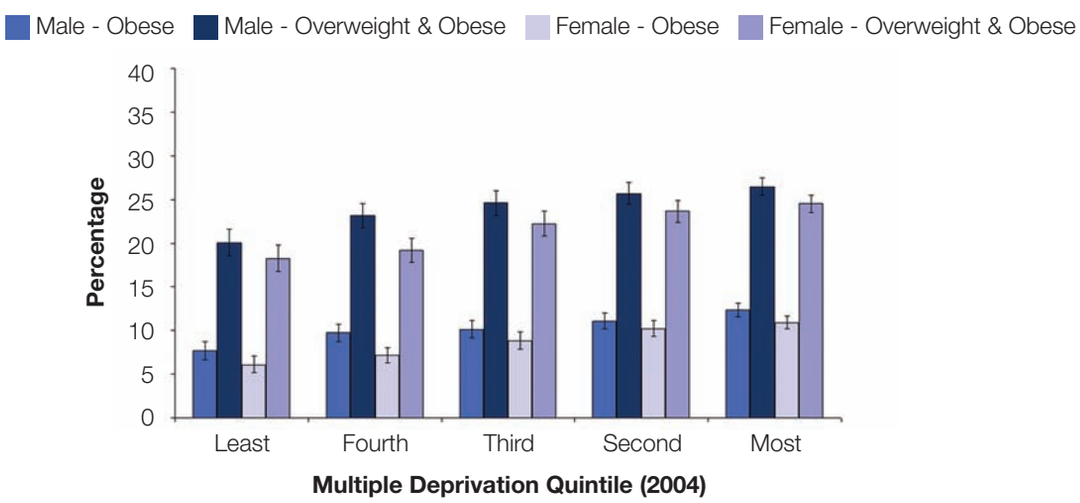
Further maps and local authority details for obese boys and girls in Reception and Year 6 can be found in the North West Children and Young People's Health Indicator reports and associated online tool at: www.nwph.net/cayphi

Deprivation and overweight and obesity in the North West

Both Reception boys and girls in the most deprived areas had higher levels of obesity, and overweight and obese, than those in the least deprived areas (Figure 5). Obesity prevalence in boys was 1.6 times higher among those from the most deprived areas (12.3%) than the least deprived areas (7.7%). In girls, obesity prevalence was 1.8 times higher in the most deprived areas (10.9%) than the least deprived (6.1%). The percentage of obese boys was higher than obese girls across all deprivation quintiles.

Overweight and obese in boys and girls was 1.3 times higher among those in the most deprived areas (boys: 26.4%; girls: 24.5%) than the least deprived areas (boys: 20.0%; girls: 18.2%) (Figure 5). The percentage of overweight and obese boys was higher than girls across all deprivation quintiles.

Figure 5: Prevalence of overweight and obese in Reception boys and girls, by deprivation quintile, North West 2006/07.

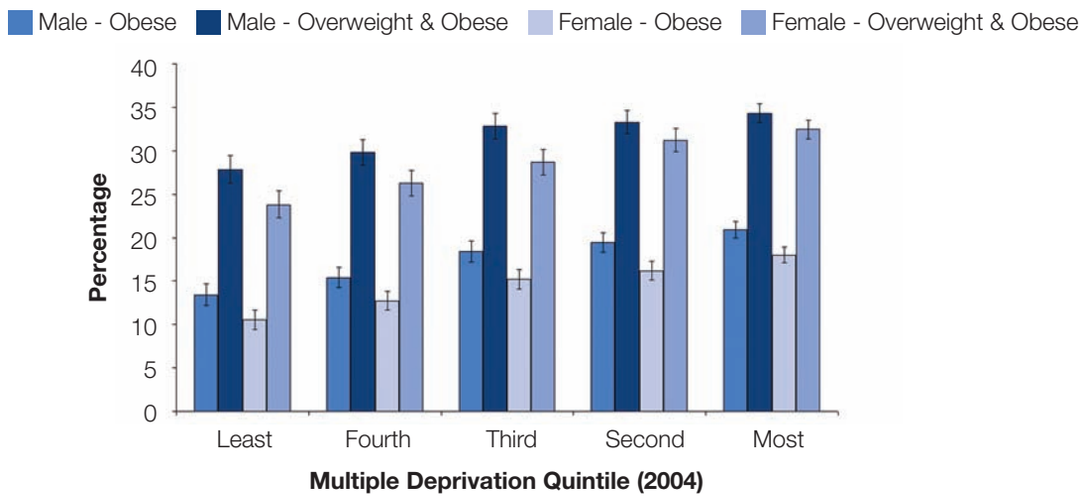


Source: North West Public Health Observatory; Index of Multiple Deprivation 2004

Obesity in Year 6 boys and girls was 1.6 and 1.7 times greater respectively among those from the most deprived areas (boys: 20.9%; girls: 18.0%) than the least deprived areas (boys: 13.4%; girls: 10.5%) (Figure 6). The prevalence of obesity was higher in boys than girls across all deprivation quintiles.

Overweight and obese prevalence in boys was 1.2 times greater among those from the most deprived areas (34.3%) than the least deprived areas (27.8%) (Figure 6). Among girls, overweight and obese prevalence was 1.4 times greater in the most deprived areas (32.4%) than the least deprived (23.8%). The prevalence of overweight and obese was higher in boys than girls across all deprivation quintiles.

Figure 6: Prevalence of overweight and obese in Year 6 boys and girls, by deprivation quintile, North West 2006/07.



Source: North West Public Health Observatory; Index of Multiple Deprivation 2004

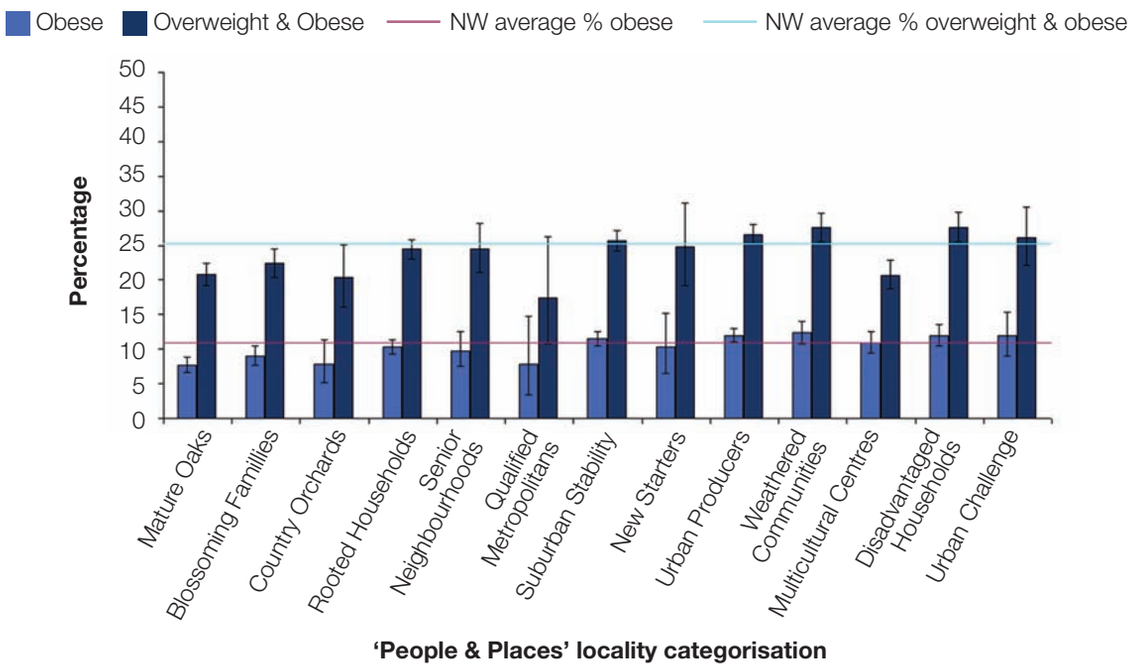
Geodemographic lifestyles and overweight and obese in the North West

A more detailed look at inequalities is possible by comparing prevalence of overweight and obese in Reception and Year 6 by the P^2 People & Places©[ix] geodemographic classification. This classification clusters together local areas that have similar resident population characteristics. The groups are ordered from the least deprived Mature Oaks to the most deprived Urban Challenge, based on the income domain from the Index of Multiple Deprivation (IMD 2004), allowing patterns different from that expected by deprivation alone to stand out.

Analysis by geodemographic classification for Reception boys illustrated that there was an expected (albeit weak) increase in obesity as deprivation increased (Figure 7). Generally speaking, the least deprived groups have a lower percentage of obese and overweight and obese than the most deprived. However, Multicultural Centres stand out as having lower than expected levels of overweight and obese (20.7%) than would be expected from deprivation alone.

[ix] For definitions of the classifications see: P^2 People and Places© Beacon Dodsworth 2004-2005: www.peopleandplaces.co.uk

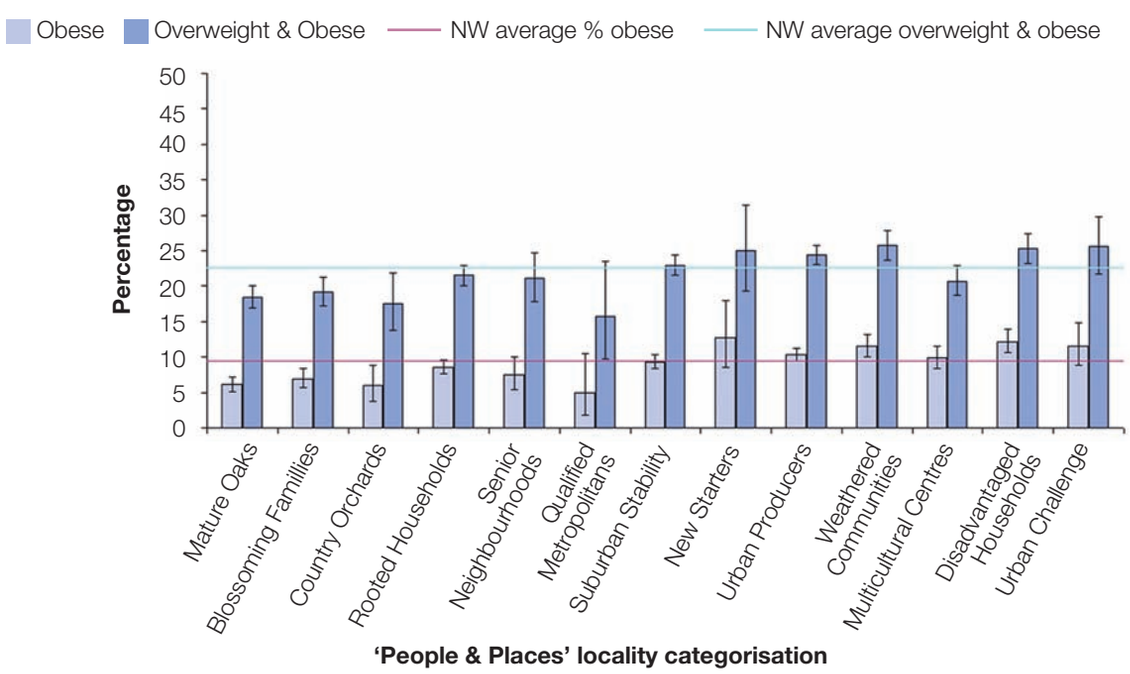
Figure 7: Percentage of overweight and obese in Reception boys, by geodemographic classification, North West 2006/07.



Source: North West Public Health Observatory; P2 People and Places©.

For Reception girls, analysis by geodemographic classification shows a similar but less accentuated pattern to boys, with Multicultural Centres again having a slightly lower than expected percentage (20.7%) of overweight and obese (Figure 8).

Figure 8: Percentage of overweight and obese in Reception girls, by geodemographic classification, North West 2006/07.

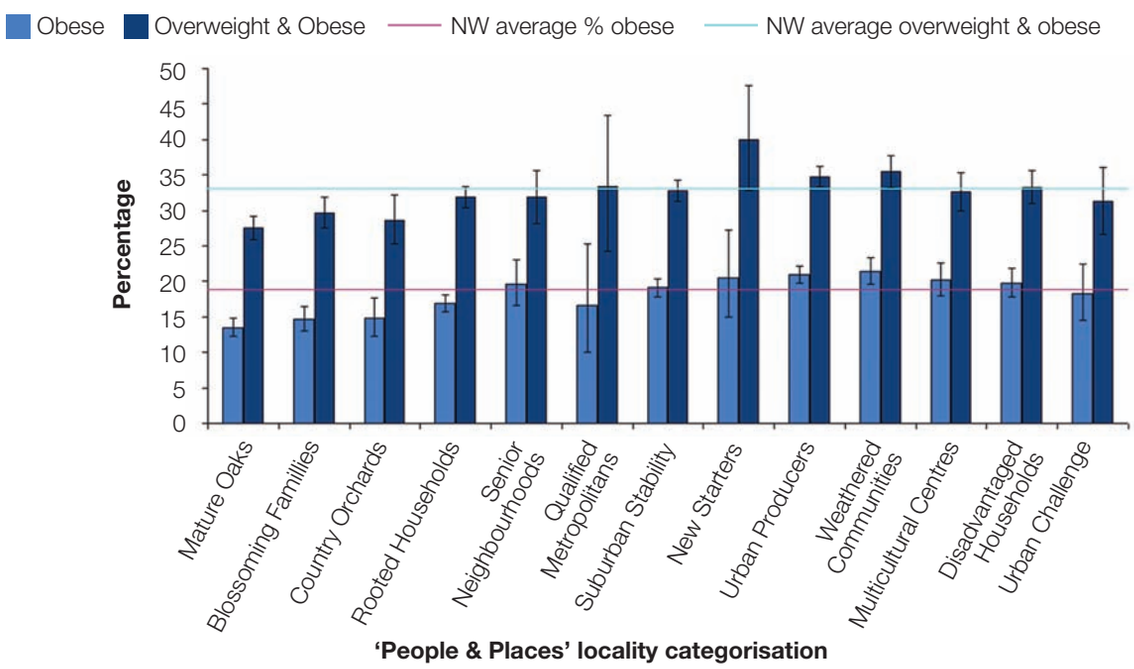


Source: North West Public Health Observatory; P2 People and Places©.

In Year 6 boys and girls, analysis by geodemographic classification shows (as with Reception children) that the prevalence of obesity tends to rise as deprivation increases, though for boys the very most deprived groups do not have the highest levels of unhealthy weight (Figures 9 & 10). Unlike with Reception children, in Year 6 the percentage of obese and overweight is closer to what may be expected for those living in Multicultural Centres, for both sexes.

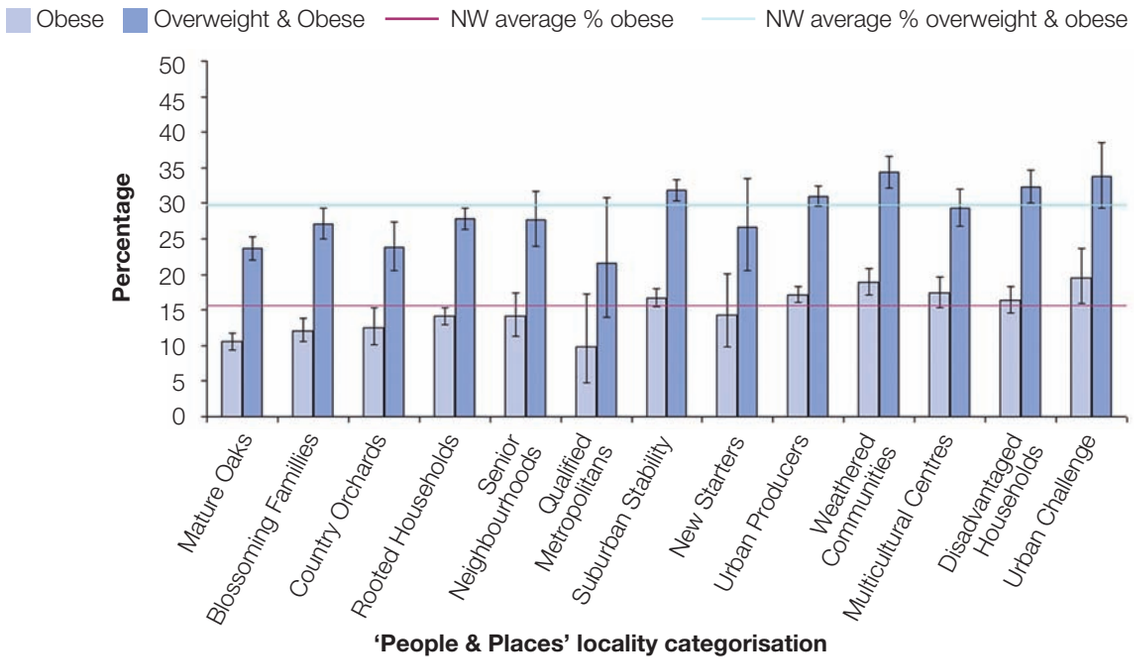
It should be noted that wide confidence intervals in Qualified Metropolitan and New Starter areas may be due to small numbers of children living in these areas.

Figure 9: Percentage of overweight and obese in Year 6 boys, by geodemographic classification, North West 2006/07.



Source: North West Public Health Observatory; P[2] People and Places©.

Figure 10: Percentage of overweight and obese in Year 6 girls, by geodemographic classification, North West 2006/07.



Source: North West Public Health Observatory; P^2 People and Places©.

A summary of which geodemographic classifications have significantly better or worse levels of obese or overweight and obese (O&O) as compared to the North West averages (Table 4) illustrates that the least deprived parts of the North West population have generally healthier weight than the most deprived. However, this is not the case for the very most deprived group (Urban Challenge) whose levels of obese and O&O do not significantly differ from the North West average.

Table 4: P^2 geodemographic classifications in the North West that significantly differ from the North West average. Males and females, Reception and Year 6, 2006/07

	Reception				Year 6			
Geodemographic classification	**Male**		**Female**		**Male**		**Female**	
	Obese	**O&O**	**Obese**	**O&O**	**Obese**	**O&O**	**Obese**	**O&O**
Mature Oaks	■	■	■	■	■	■	■	■
Blossoming Families	■	■	■	■	■	■	■	
Country Orchards			■	■	■	■		■
Rooted Households					■			
Senior Neighbourhoods								
Qualified Metropolitans								
Suburban Stability								■
New Starters								
Urban Producers					■			
Weathered Communities			■	■	■	■	■	■
Multicultural Centres		■						
Disadvantaged Households			■	■				
Urban Challenge								

■ significantly better ■ significantly worse

Source: North West Public Health Observatory; P^2 People and Places©.

Physical activity

In Liverpool, the SportsLinx project has been collecting data on the state and changes in physical fitness and dietary behaviour of 13,000 school children from Year 5 (9-10 years) since 1998/99 and Year 7 (11-12 years) since 2001/02.

The study data from the 2001-2003 report on the Health and Fitness of Liverpool Primary and Secondary School Children[73] revealed that just over 25% of all Year 5 pupils failed to undertake any physical activity or only undertook low levels of physical activity during morning or lunchtime breaks, rising to 60% and 40% of Year 7 boys and girls respectively. However, more children were engaging in after school exercise and approximately 50% of Year 5 children walked to school.

Details of the Liverpool SportsLinx project and publications cited above as well as the Research into Exercise, Activity and Children's Health (REACH) Group can be found at: www.ljmu.ac.uk/ecl/psd/reach/INDEX.htm

In 2005/06 a number of local authority physical activity projects were identified across the North West and entered onto a physical activity database. Details of this database along with its associated report *Physical Activity, Exercise, Sport and Health: Regional Mapping for the North West - Executive Summary* are available at: www.nwph.net/pad. Whilst this monitoring is not continued there is very little information available to maintain a region-wide picture of local interventions and programmes that can help contribute to healthy weight in the North West.

Future overweight and obese prevalence

Details of predicted levels of overweight and obese in children aged 2-10 years and 2-15 years for the year 2010 (as well as for the 2-5 years, 6-10 years and 11-15 years age groups) may be found at www.ic.nhs.uk/statistics-and-data-collections/healthand-lifestyles and in the *Forecasting Obesity to 2010 report*[74].

5. CONCLUSIONS AND RECOMMENDATIONS

- In the North West region, levels of obesity and 'unhealthy weight' (overweight and obese) are similar to those in England, including showing similar inequality gradients by deprivation (IMD 2004). Therefore the region faces the same challenges as the country as a whole to eliminate this epidemic and halt the rise in obesity. The relationship between deprivation and obesity is stronger than the relationship between deprivation and 'unhealthy weight'. This means that affluent areas generally have a larger proportion of overweight than obese. 'Unhealthy weight' is therefore a problem for the whole region, and cannot be tackled by only targeting deprived populations.
- Current population segmentation intelligence does not identify any other specific target groups within the North West. The region's child height and weight analysis using the P^2 People and Places© geodemographic classifications reveals the same gradient with deprivation but fails to highlight any obvious groups that have particularly higher than expected levels of obesity or 'unhealthy weight'. It does, however, identify Multicultural Centres as having lower than expected overweight and obesity for the given level of deprivation. This might be a real epidemiological pattern, but under-measurement due to heavier children being actively excluded needs to be ruled out first.

- The North West Public Health Observatory (as a Department of Health safe haven and through agreements with the PCT) collates child height and weight data for the region to provide additional analysis not available nationally. Collating child details has proved invaluable to enable analysis at the residence level by, for example, Index of Multiple Deprivation and geodemographic classification and thus provides intelligence for planned and targeted interventions. In 2007, 69% of Reception year children and 78% of Year 6 children had a postcode of residence recorded; therefore there is still room for improvement in future datasets.
- It is imperative that the region continues the detailed surveillance on childhood height and weight measurement and continues to collate a regional dataset to enable this detailed analysis to be undertaken[x]. More timely and more disaggregated local authority measures need to be produced regionally which are fed into local plans and strategies more effectively. In addition, other population segmentation analysis, including incorporating more insight, attitudinal and behavioural survey data not previously available could be applied to the North West dataset to investigate whether localised targeting of populations can be achieved through this valuable resource.
- As part of the Department of Health *Healthy Weight, Healthy Lives* programme, a more detailed national insight has been used to identify target audiences specifically to help tackle the rise in obesity. This segmentation of families with young children covers attitudes and behaviours in relation to food and exercise and will be made available to PCTs, along with detailed maps, to support local strategies and social marketing initiatives. Attaching this audience insight to local health outcome measures of unhealthy weight, from regional child height and weight datasets and other intelligence, will be a next step for the NWPHO to help support a greater understanding of how to effectively apply and evaluate the national population segments.
- Social marketing in relation to obesity is being actively supported at the regional level, including by the 'Our Life' programme. The initial focus of Our Life is on over-consumption of food and alcohol, both of which have a significant impact on individuals, families, communities and businesses in the North West. NWPHO provides social marketing analytical support to Our Life as well as to the intelligence needs of the regional healthy weight agenda.
- The causal influences of unhealthy weight (such as diet, physical activity and general wellbeing) currently do not have robust or locally comparable intelligence. There is, however, some positive indication that changes are occurring nationally and regionally. For example, levels of household purchasing of confectionery are falling while fruit and vegetable purchases are increasing. Regional programmes currently underway or being established following the *North West Framework: to achieve healthy weight for children and families*[75] should be used to collate population measures for some of these risk factors with more regional data and local indicators being developed.
- NWPHO are supporting this with the production of 'North West Children and Adults' Healthy Weight Indicators' as specified in the North West Framework. This project aims to develop a set of indicators which have an established relationship with weight across a number of key themes such as food and nutrition, physical activity and breastfeeding. This indicator dataset will provide sub-regional information, comparisons against the regional and national averages, and will offer a benchmark against which progress can be measured. The data will be made available as an online tool and will be a valuable resource to a range of professionals and practitioners in health, education, local authorities and voluntary organisations.
- One big gap in the intelligence for tackling the rise in obesity remains the evidence base for what works at a local level. This is one role being taken on by the newly established National Obesity Observatory (www.noo.org.uk). However, the public health networks across the North West are

[x] Postcoded data will be collated nationally for 2008 but issues with the accurate reporting of residence centrally were only identified by comparing regional and national datasets, such that national analysis in 2007 was only produced using school location.

best placed to identify the wide range of local activities, share best practice and assess their local effectiveness. Evaluation of these numerous local programmes is essential. Bringing together information about each of the local healthy weight related projects, programmes, schemes and initiatives onto a central system, in a similar manner to the North West Physical Activity Database, would be of great value in identifying areas of good practice in the region and at the same time enable a system to evaluate these interventions to be established.

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Useful Resources

- **Cancer Research UK** http://info.cancerresearchuk.org/publicpolicy/briefings/prevention/obesity
- **Care pathways for the management of overweight and obese individuals**:
  www.dh.gov.uk/assetRoot/04/13/45/60/04134560.pdf
  www.dh.gov.uk/assetRoot/04/13/44/12/04134412.pdf
  www.dh.gov.uk/assetRoot/04/13/44/13/04134413.pdf
- **Care Services Improvement Partnership** http://northwest.csip.org.uk
- **Centres for Disease Control and Prevention – Overweight and Obesity**
  www.cdc.gov/nccdphp/dnpa/obesity
- **Department of Health – Obesity**
  www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/Obesity/fs/en
- **Government Office North West** www.go-nw.gov.uk
- **International Association for the Study of Obesity** www.iaso.org
- **Institute of Food Science and Technology** www.ifst.org
- **National Institute of Clinical Excellence – Shared Learning Database**
  www.nice.org.uk/sharedlearning
- **The British Nutrition Foundation** www.nutrition.org.uk
- **The Counterweight Programme** www.counterweight.org
- **The Food Standards Agency** www.food.gov.uk
- **The International Obesity Taskforce** www.iotf.org
- **The MEND Programme** www.mendprogramme.org
- **The National Child Measurement** Programme www.ncmp.ic.nhs.uk
- **The National Obesity Forum** www.nationalobesityforum.org.uk
- **The North West Breastfeeding Framework for Action**
  www.skillsforcarenw.org.uk/0710docs/upstream0710.doc
- **The North West Food and Health Taskforce** www.nwph.net/food_health/default.aspx
- **The Obesity Awareness and Solutions Trust** www.toast-uk.org
- **UK Foresight Project** www.foresight.gov.uk/Obesity/Obesity.htm
- **World Health Organization – Obesity and Overweight**
  www.who.int/dietphysicalactivity/publications/facts/obesity/en

Ten Top Tips for Achieving Healthy Weight *

1. **Eat healthily.** Have a balanced and varied diet (see the 'eatwell plate' at www.eatwell.gov.uk/healthydiet/eatwellplate/?lang=en), including at least five portions of fruit and vegetables every day (including frozen and tinned). Swap unhealthy snacks such as chocolate and crisps for healthy snacks like fruit and unsalted nuts and use unsaturated fats such as olive oil instead of butter.
2. **Shop healthily** and don't shop when hungry.
3. **Eat at regular times** as skipping meals leads to bingeing.
4. **Eat moderate portions** and stop eating before you're full.
5. **Drink** at least two litres of water a day and drink alcohol in moderation - on nights out alternate between alcoholic and soft drinks.
6. Try and make **physical activity** a regular part of your everyday life – join a walking group; join a gym; start a new exercise class; set up a walking bus to school; cycle/walk to work, or if you have to drive, park further away; take the stairs instead of the lift. Set yourself realistic goals that you will be able to achieve and make it fun by doing activities that you like. Light exercise such as going for a short walk can also help to relieve stress.
7. Periodically **check your weight** and maintain a health body mass index (BMI) ratio (to calculate your BMI see www.bdaweightwise.com/lose/lose_bmi.aspx).
8. Get **eight hours sleep** per night to stay healthy and regulate your weight.
9. **Discuss any concerns** that you have about your weight or your family's weight with a health professional.
10. Get a **good balance** between work, play, relaxation, exercise and healthy eating.

* sourced from various references included in the text