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OBESITY INQUIRY RESEARCH PAPER

This research paper provides an introduction to the issue of obesity and its increasing prevalence throughout the population in Northern Ireland.

The paper identifies the extent of overweight and obesity levels in Northern Ireland and the policy response from the DHSSPS in tackling this challenging public health issue. The paper also highlights the key causes and risk factors associated with obesity and provides a comparative overview of a number of interventions and treatments currently employed in the UK and internationally.

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1. INTRODUCTION - OBESITY – A GLOBAL ‘EPIDEMIC’

Overweight and obesity can be defined ‘as abnormal or excessive fat accumulation that may impair health’.¹ The obesity issue has generated considerable debate fuelled by concerns of the World Health Organisation (WHO) and governments around the world that obesity prevalence has reached epidemic levels. A number of observers contest the general consensus of rising obesity levels by arguing that the ‘myth of obesity’ is perpetuated by the state seeking to exert a ‘big brother’ influence over the personal lives of its citizenry.² The majority view, based on extensive government and independent research is that obesity represents one of the most complex public health issues confronting governments in the decades ahead.

In recent decades, there has been a significant increase in overweight and obesity prevalence rates in many countries around the world. According to the WHO, ‘excess body weight poses one of the most serious public health challenges of the 21st century.’³ The WHO’s latest projections indicate that globally in 2005 there were approximately 1.6 billion adults (15 years and over) overweight and at least 400 million obese. In Europe, the WHO contends that the rapidly increasing prevalence of obesity will include 150 million adults and 15 million children by 2010.⁴

Even in the developing world there is evidence that levels of overweight and obesity are increasingly affecting population health, many of who already suffer from the affects of malnutrition. A 1999 United Nation (UN) study discovered obesity in many developing regions and growing rapidly, even in countries where hunger exists. In China, the number of overweight people jumped from less than 10 per cent to 15 per cent in just three years. In Brazil and Colombia the figure at the turn of the century was round 40 per cent, while even in sub-Saharan Africa, where the majority of the world’s hungry live, obesity levels are increasing, especially among urban women. In addition to these figures, the study also revealed that there was a correlation between rising income and increasing obesity prevalence throughout these developing regions.

Another interesting finding within the UN report was the connection between obesity and micronutrient deficiency. Despite the rise in levels of overweight as well as those suffering from starvation, the study argued that both groups were being deprived of important micronutrients like vitamins and minerals. According to a Senior Officer in the UN’s Food and Agriculture Organisation, ‘The thinking used to be that if people get enough energy in their diets, the micronutrients will take care of themselves...But increasingly people are eating larger quantities of cheap food that fill the stomach but still leave the body without those micronutrients’.⁵

¹ World Health Organisation (WHO) (2006) *Fact Sheet*, September.

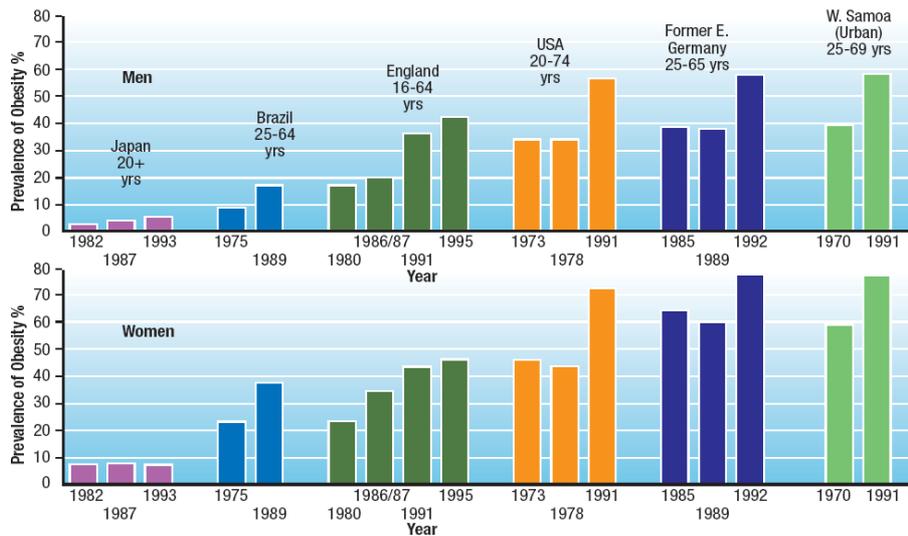
² See Basham, P and Luik, J. (2006) ‘Four big, fat myths’, *Daily Telegraph*.

³ World Health Organisation (2007) *The challenge of obesity in the WHO European Region and the strategies for response*, World Health Organisation: 1.

⁴ World Health Organisation (2007) *The challenge of obesity in the WHO European Region and the strategies for response*, World Health Organisation: 1.

⁵ UN Report figures cited in an article published on the International Obesity Taskforce website entitled, ‘The developing world’s new burden: obesity’, January 2002 – the article can be accessed electronically at:

<http://www.iof.org/popout.asp?linkto=http://www.fao.org/FOCUS/E/obesity/obes1.htm>

Figure 1: The growing epidemic of obesity⁶

A major part of the explanation for the WHO's forecast in relation to the long-term challenge presented by obesity is the widespread and embedded nature of the condition within many modern western societies. While acknowledgement of the acuteness and prevalence of obesity is a relatively recent development, the transition of modern societies characterised by increasing obesity levels has been occurring over the last three decades. Research commissioned by the UK Government's *Foresight* programme examining ways of tackling obesity, revealed that, 'the causes of obesity are embedded in an extremely complex biological system, set within an equally complex societal framework [and] will take several decades to reverse those factors driving current obesity trends.'⁷

A recurrent conclusion within the substantial body of research undertaken into obesity is that while effectively tackling the condition may seem straightforward i.e. reduce energy-dense food and drink consumption and engage in more regular physical activity, the reality is rather different. The primary factor contributing to the complexity of obesity is that 'energy imbalance' is determined by a 'complex multifaceted system of determinants or causes'. Part of this complexity is the need to effectively tackle the societal impact of the rapid pace of technological revolution that began in the previous century and continues to contribute significantly to the development of an increasingly 'obesogenic environment'. The incremental movement towards these environments comprise a whole range of social, cultural and infrastructural conditions which compromise an individual's ability to adopt a healthier lifestyle.

Effective intervention in tackling the growing problem of obesity and overweight has become a priority at the centre of public health strategies around the world. A major part of the explanation for this lies in the significant consequences on health and the economy generated by increasing obesity prevalence rates across the population.

⁶ International Obesity Task Force (IOTF) and European Association for the Study of Obesity (EASO) (2002) *Obesity in Europe – the case for action*, London cited in National Taskforce on Obesity (RoI) (2005) *Obesity – The Policy Challenges – The Report of the National Taskforce on Obesity 2005*, National Taskforce on Obesity (RoI): 18.

⁷ Butland, B. *et al* (2007) 'Tackling Obesities: Future Choices – Project Report', 2nd edition, *Government Office for Science*: 5.

Firstly, the direct medical consequences of obesity are well known and include coronary heart disease, a number of cancers including breast and colon cancer, as well as a number of orthopaedic conditions. Secondly, policymakers are increasingly concerned that the growing obesity problem will place a substantial financial burden on their respective health finances. This is particularly pertinent within the four universal, tax-funded health systems of the NHS. According to the 2007 Foresight report (Butland *et al*) in the UK 'by 2050, 60 per cent of males and 50 per cent of females could be obese, adding £5.5 billion to the annual cost of the NHS, with wider costs to society and business estimated at £49.9 billion.'⁸

2. OBESITY PREVALENCE

2.1 MEASURING OBESITY – BODY MASS INDEX (BMI)

One of the key mechanisms routinely employed in the measurement of obesity prevalence around the world is the Body Mass Index (BMI). BMI is a simple index of weight-for-height (weight in kilograms divided by the square of the height in metres) and is recognised by the WHO as the most useful mechanism in providing a population-level measurement of overweight and obesity. It is important to note, however, that it is also widely recognised that there are certain limitations associated with BMI. The WHO has advised that figures derived from the BMI should be employed as a rough guide as they may not accurately reflect the same degree of fatness in different individuals.⁹ These limitations are particularly apparent in the measurement of childhood overweight and obesity as height and weight continue to change as children grow. Recent research has advocated the measurement of waist circumference as being more closely associated with mortality and morbidity than BMI.¹⁰

Figure 2: Body Mass Index Classifications¹¹

Classification	BMI
Underweight	<18.5
Normal range	18.5–24.9
Overweight:	≥25.0
Pre-obese	25.0–29.9
Obese class I	30–34.9
Obese class II	35–39.9
Obese class III	≥40.0

⁸ Butland, B. *et al* (2007) 'Tackling Obesities: Future Choices – Project Report', 2nd edition, Government Office for Science: 5.

⁹ World Health Organisation (WHO) (2006) *Fact Sheet*, September.

¹⁰ Price *et al* (2006) 'Weight, shape, and mortality risk in older persons: elevated waist-hip ratio, not high body mass index is associated with a greater risk of death', *Am J Clin Nutr*, 84 (2): 449-460 cited in P. Musingarimi (2008) *Obesity in the UK: A Review and Comparative Analysis of Policies within the Devolved Regions*, International Longevity Centre: 8.

¹¹ Butland, B. *et al*. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science: 150.

2.2 UNITED KINGDOM AND THE REPUBLIC OF IRELAND

Obesity is defined as someone within a BMI of 30 or over. According to the WHO Europe Regional Database, in the UK, 62.3 per cent of adults (aged 16 years and over) are overweight with a BMI of 25 and over, with 24.4 per cent of these adults obese. Meanwhile, in the Republic of Ireland, the 2007 Survey of Lifestyle, Attitudes and Nutrition in Ireland (SLAN) reported that 39 per cent of the adult population were overweight and 25 per cent were obese. Following a similar trend in the UK, overweight and obesity levels in the Republic of Ireland have continued to rise or remained the same over the period of the previous two surveys in 1998 and 2002. Obesity levels based on self-reported data have increased over the period of the three surveys, from 11 per cent in 1998 to 15 per cent in 2002 and levelled off at 14 per cent in 2007. Overweight levels have increased between 1998 (31 per cent) and 2002 (33 per cent) and increased again in 2007 (36 per cent).¹² While these figures do not include measured BMI of individuals and are reliant on self-reported data through completion of questionnaires, the data indicates there has been a significant rise in the prevalence of overweight and obesity in the Republic of Ireland in the last decade.

It is important to note the difficulties associated with collating accurate data across the different jurisdictions. In her review of the comparative analysis of anti-obesity policies in operation throughout the devolved regions, Musingarimi highlights a number of points which currently undermine the comparative analysis of the prevalence rates across the UK. Firstly, she points to the fact that in the UK data on health (including overweight and obesity) are collected separately in the devolved regions and currently there is no single UK-level obesity surveillance survey undertaken. Secondly, following on from the point made earlier relating to prevalence rates in the Republic of Ireland, there are reliability issues around the methodologies employed in data collection. For example, data for England and Scotland use actual measurements of height and weight while in Wales and Northern Ireland, less-reliable self-administered questionnaires – which are known to result in underestimation of prevalence are employed.¹³

3. CAUSES AND RISK FACTORS OF OBESITY

3.1 OVERVIEW OF THE CAUSES OF OBESITY - ENERGY IMBALANCE

Historically, obesity had been thought to be only a simple matter of an imbalance of the equation between energy intake and energy expenditure. However, research has now indicated that many factors involved in why an individual may become obese including genetic, physiological and behavioural factors.

Energy is consumed in the diet through protein, carbohydrate and fat and excess calories are subsequently converted and stored as triglycerides¹⁴ in adipose tissue (body fat). Over time, consumption of excess calories, without an increase in energy

¹² Department of Health and Children (2007) *Survey of Lifestyle, Attitudes and Nutrition in Ireland – Main Report*, Department of Health and Children: 100-101.

¹³ Musingarimi, P. (2008) *Obesity in the UK: A Review and Comparative Analysis of Policies within the Devolved Regions*, international Longevity Centre: 8-11.

¹⁴ Triglycerides consist of three individual fatty acids bound together in a single large molecule; an energy source forming much of the fat stored by the body

expenditure, will cause excess body fat to be stored which may lead to obesity. Energy expenditure is composed of basal metabolic rate, the thermic effect of food and physical activity (including both activity-related thermogenesis¹⁵ [volitional exercise] and non-activity related exercise thermogenesis [all other activity not related to 'sporting-like' exercise]). It has been estimated that spontaneous minor activity performed during the day accounts for 20 per cent of the differences of energy expenditure between individuals in a 24 hour period.¹⁶

Although the specific causes of obesity at an individual level are varied it is accepted that, 'At the heart of obesity lies a homeostatic biological system that struggles to maintain energy balance to keep the body at a constant weight. This system is not well-adapted to a fast-changing world, where the pace of technological progress has outstripped human evolution'.¹⁷ It is also now accepted that 'changes in the external environment have revealed this underlying tendency to gain weight in more of the population...the technological revolution of the 20th Century has left in its wake an 'obesogenic environment' that serves to expose the biological vulnerability of human beings'.¹⁸

The following sections of this paper discuss key causes and risk factors of obesity in more detail, including:

- Biological causes and risk factors, including genetics and hormonal and neural pathways;
- Impact of early life and growth patterns;
- Behaviour with respect to eating and physical exercise;
- The living environment – obesogenic environment; and
- Health Inequalities.

3.2 BIOLOGICAL CAUSES AND RISK FACTORS

Food is a fundamental biological necessity, so the body has evolved that the '*hunger* drive is very powerful...by contrast, there is limited sensitivity to abundance. The feelings of having had enough (satiety clues) are weak and easily overridden by external factors such as the sight of food and how it tastes'.¹⁹ Evidence from research 'argues against any difference in basic physiology between the slim and obese, or any mechanism that somehow protects lean individuals from weight gain by the stimulation of specific metabolic pathways when faced with an energy excess'.²⁰

¹⁵ Thermogenesis - the production of heat in the body by physiological processes

¹⁶ Wilborn, C. et. al. (2005), Obesity: Prevalence, Theories, Medical Consequences, Management, and Research Directions, *Journal of the International Society of Sports Nutrition*, 2(2): 4-31

¹⁷ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science, Section 3, page 48

¹⁸ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science, Executive Summary, page 8

¹⁹ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science, Section 3, page 46

²⁰ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science, Section 3, page 46

3.2.1 Genetics and Genomics

It is believed that any explanation of the obesity epidemic must include the role of genetics as well as the role played by the environment,

One commonly quoted genetic explanation for the rapid rise in obesity is the mismatch between today's environment and 'energy-thrifty genes'...according to the 'thrifty-genotype' hypothesis, the same genes that helped our ancestors survive occasional famines are now being challenged by environments in which food is plentiful year round...the thrifty genotype is just part of a wider spectrum of ways in which genes can favour fat accumulation in a given environment.²¹

Genomics is the study of the entire human genome and involves studying individual genes as well as the interactions of multiple genes with each other and with the environment. Research highlights that considering the obesity epidemic from a genomics perspective, has the potential to improve the effectiveness of prevention and intervention strategies. However, it is not yet possible to allow for a personalised obesity intervention based on genetic predisposition.²²

Only 1 per cent – 5 per cent of obesity cases can be explained by a single gene mutation,²³ however, common obesity (which affects most people with obesity) 'is a complex disorder with contributions from multiple genes and gene variants...the search for specific genes...provides a foundation for understanding the effect of environmental and lifestyle factors'.²⁴ Evidence suggests that genetic factors are involved in all aspects of weight regulation, including appetite, eating behaviour, taste, satiety, thermogenesis²⁵ and motivation to exercise. More than 400 genes or markers have now been associated with obesity and some of the more commonly discussed genes and their characteristics are listed in the table below:
Examples of Genes Involved in Obesity and Their Associated Phenotypes²⁶

²¹ Obesity and Genetics: A Public Health Perspective, CDC, Office of Public Health Genomics, www.cdc.gov/genomics/training/perspectives/files/obesedit.htm

²² Zlot, A. et. al. (2007), Addressing the Obesity Epidemic: A Genomics Perspective, Preventing Chronic Disease, 4(2), A31, <http://ukpmc.ac.uk/articlerender.cgi?artid=1029831>

²³ Mutation - any alteration in the inherited nucleic acid sequence of the genotype of an organism.

²⁴ Zlot, A. et. al. (2007), Addressing the Obesity Epidemic: A Genomics Perspective, Preventing Chronic Disease, 4(2), A31 <http://ukpmc.ac.uk/articlerender.cgi?artid=1029831>

²⁵ Thermogenesis - the production of heat in the body by physiological processes

²⁶ Zlot, A. et. al. (2007), Addressing the Obesity Epidemic: A Genomics Perspective, Preventing Chronic Disease, 4(2), A31 <http://ukpmc.ac.uk/articlerender.cgi?artid=1029831>

Gene	Associated Phenotype (Characteristic)
Leptin	Satiation, metabolism
Melanocortin	Feeding behaviour, binge eating
Ghrelin	Appetite stimulation
Neuromedin β	Feeding behaviour, satiety
PROP	Taste preference
PPAR	Fat metabolism
Mitochondrial uncoupling proteins	Energy expenditure
Melanocortin and MC4R	Energy expenditure

Some recent genetic findings include:

- The impact of the FTO allele,²⁷ described as ‘the most clear genetic link yet to obesity in the general population’ people carrying one copy of the FTO allele have a 30 per cent increased risk of being obese compared to a person with no copies. A person carrying two copies of the allele has a 70 per cent increased risk of being obese, being on average 3Kg heavier than a similar person with no copies of the allele, ‘among white Europeans, approximately one in six people carries both copies of the allele’²⁸;
- In 2008, in a genetic study of more than 90,000 people, researchers identified six new genetic variants that are associated with increased Body Mass Index. Five of the genes ‘are known to be active in the brain, suggesting that many genetic variants implicated in obesity might affect behaviour, rather than the chemical processes of energy or fat metabolism’²⁹; and
- In January 2009, scientists published the results of a ten year study which looked at the genetic makeup of obese children under six and morbidly obese adults, most of whom had been obese since childhood or adolescence, and compared this with age matched people of normal weight. The study revealed three new genetic variations linked to the risk of severe obesity.³⁰ Further research is needed to establish whether or not these gene variants are acting independently or together to increase risk of obesity.³¹

3.2.2 Hormonal and neural pathways and feedback loops

Numerous circulating peptides and steroids (produced in the body by fat cells, the gastrointestinal tract and the endocrine pancreas) influence appetite through their actions on the hypothalamus,³² the brain stem and the autonomic nervous system³³.

²⁷ Allele - Any of the possible forms in which a gene for a specific trait can occur.

²⁸ Major Genetic Study Identifies Clearest Link Yet to Obesity Risk, Wellcome Trust, Press Releases, 13 April 2007, <http://www.wellcome.ac.uk/News/Media-office/Press-releases/2007/WTX036897.htm>

²⁹ Brain genes associated with obesity, 15th December 2008, www.mrc-epid.cam.ac.uk/News/NewsArchive/Obesity & Brain.html

³⁰ A variant near the PTER gene, a variant found in the NPC1 gene, and a variant near the MAF gene, which controls the production of the hormones insulin and glucagon

³¹ Childhood obesity risk increased by newly-discovered genetic mutations, Imperial College London, News Release, 18th January 2009

³² Hypothalamus - The part of the brain in vertebrates that lies below the thalamus and cerebrum. It controls the autonomic nervous system and the secretion of hormones by the pituitary gland.

Analysis of the function of genes involved with obesity has identified important hormonal and neural pathways and feedback loops, especially for the hormone leptin and for the melanocortin system. Researchers are currently investigating anti-obesity therapies based on these naturally occurring hormones and neurotransmitters. It is believed that control of appetite and the hormonal and neural systems underpinning this control will be key to weight control strategies.³⁴

These hormonal and neural pathways provide the more immediate links between emotional cues to eat, food ingestion, and absorption, including the stimulation of gut hormones and the release of insulin. Longer-term control of energy is provided by feedback loops which come in part from fat (adipose) tissue itself. Leptin is a good example of one of the molecules involved in the control of energy intake and appetite control. It is now believed that falling levels of leptin stimulates hunger and food seeking behaviour to increase food intake when body weight is low. 'Some constitutionally lean individuals may have a finely tuned appetite control system that precisely matches energy intake to meet energy needs. Other individuals may have a poorly tuned control system in which food intake is persistently above energy needs, making them more susceptible to obesity'.³⁵

The melanocortin system is believed to be the best characterised neuronal pathway involved in the regulation of energy homeostasis. It is likely to be involved in integrating long-term adipostatic signals from leptin and insulin, received by the hypothalamus, with acute signals regulating hunger and satiety, primarily received by the brain stem.³⁶

3.3 IMPACT OF EARLY LIFE AND GROWTH PATTERNS

It is accepted that the pattern of growth during early life is one determinant of the future risk of obesity. 'A baby's growth rate in the womb and beyond is in part determined by parental factors, especially with regard to the mother's diet and what and how she feeds her baby'.³⁷ In common with other research around the world, which has demonstrated that undernutrition and stunting of growth in early life promote adult obesity, a recent discovery of a collection of over 8500 child growth records in Helsinki, Finland has shown that the pattern of growth that leads to obesity-related disease actually begins with low birthweight and small body size during infancy,

A sample of 2003 people in the Helsinki cohort, selected at random...show that small body size at birth, low BMI at 2 years and increase in BMI between 2 and 11 years are linked to the development of insulin resistance, a known risk factor for coronary heart disease and type 2 diabetes.³⁸

³³ Coll, A. P. et. al. (2007) The Hormonal Control of Food Intake, *Cell*, 129(2), 251-262, Abstract, [http://www.cell.com/abstract/S0092-8674\(07\)00447-3](http://www.cell.com/abstract/S0092-8674(07)00447-3)

³⁴ Understanding the hormonal control of appetite may be key to effective anti-obesity treatments, Wellcome Trust, News and Features, 12th February 2007, www.wellcome.ac.uk/News/2007/News/WTD026336.htm

³⁵ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science, Section 3, page 44

³⁶ Cone, D. (2005), Anatomy and regulation of the central melanocortin system, *Nature Neuroscience*, 8, 571-578, Abstract, www.nature.com/neuro/journal/v8/n5/abs/nn1455.html

³⁷ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science, Section 3.2, page 47

³⁸ Barker, D.J.P. (2006), Obesity and early life, *Obesity Reviews*, 8 (suppl. 1), 45-49

The period soon after birth is believed to be a time of 'metabolic plasticity' and while there is less evidence of a link between actual birth weight and obesity, it is weight gain in early life that appears to be the critical issue. Breast-fed babies show slower growth rates than formula-fed babies and this may contribute to the reduced risk of obesity later in life. It appears that low birth weight babies may be susceptible to a catch-up rapid weight gain while other babies may experience this as a direct result of their diet. Weaning practices have also been implicated in a risk of later obesity. Despite the need for more research, work to date suggests that 'early life is a critical period for health development'.³⁹

Research work is ongoing within the UK to identify genetic, dietary and other factors that act during fetal and infant life, with the aim of identifying the factors of early infant diet and growth that predict childhood obesity and to develop and test interventions to avoid excessive infant weight gain and childhood obesity.⁴⁰

A study involving over 8000 children aged 7, has highlighted eight key factors associated with an increased risk of childhood obesity at the age of 7.⁴¹ The factors included those outlined above:

- Birth weight;
- Size in early life, measured at 8 and 18 months;
- Rapid weight gain in the first year of life;
- Rapid catch-up growth between birth and two years of age; and
- Early development of body fatness in pre-school years i.e. before the age at which body fat should be increasing (at the age of 5-6).

The following additional factors were also identified:

- Obesity in one or more parents;
- More than eight hours spent watching TV a week at the age of three; and
- A short amount of sleep – less than 10.5 hours a night at the age of three.

3.4 BEHAVIOUR

Energy balance is influenced by two main behaviours, eating behaviour (shaped by drive to eat and opportunity to eat) and physical activity (shaped by individual metabolic predisposition and the environment of the individual). When considering the role of behaviour in obesity, 'organisational behaviours play a substantial but often unconsidered role in cuing the behaviours of individuals. For example, it is organisations that make decisions about the range of snacks in the workplace, the availability and content of vending machines, and whether employees receive incentives to use cars but no incentives to use bicycles.⁴²

The influence of family behaviour on children is important as children are more likely to be obese if one or more of their parents are obese. This is not just genetic but the

³⁹Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science, Section 3.2, page 47

⁴⁰Ong, K., Determinants of fetal growth and childhood obesity, MRC Epidemiology Unit, www.mrc-epid.cam.ac.uk/Research/Growth/

⁴¹Eight factors for childhood obesity, www.dailymail.co.uk/health/article-349378/Eight-factors-childhood-obesity.html

⁴² Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science, Section 3.3.2, page 50.

home environment and the attitudes and behaviours of parents and family members also contribute to this increased risk for children.⁴³

It has been recognised that,

...observational studies of human behaviour in this area are hampered by the lack of robust, objective measures of dietary intake and physical activity and by behavioural and attitudinal measures in large populations". However, "it is now widely accepted that there are subtle shifts in both diet and physical activity that influence obesity trends, and at a population level, may be below the limits of detection of current methodologies."⁴⁴

It remains difficult to accurately measure dietary intake outside a laboratory setting. However combining data from various kinds of research, a number of dietary risk factors have been indicated:⁴⁵

- Foods with a high energy density (especially snack foods consumed to supplement rather than replace meals);
- Diets high in fat and low in fibre; and
- Consumption of sugar-rich drinks.

Behavioural research has indicated that changes in the food environment, (e.g. increased variety; advertising; low cost for processed, energy dense foods; increased eating and snacking outside the home) have stimulated food intake beyond that required the match energy expenditure and people's weight has increased as a consequence. Behavioural researchers propose that there is a need to 'model and test food environments that are hypothesized to result in better weight control' and that 'industry will need to engage with a health agenda that promotes less, rather than more, consumption'.⁴⁶ Some research has focused on very specific aspects of eating behaviour, for example, speed of eating. A study in Japan looked at the eating habits of 3,000 people. Compared with those who said they did not eat quickly, fast-eating men were 84 per cent more likely to be overweight, and women were just over twice as likely. It has been suggested that such fast eating behaviour could interfere with the gastric feedback signalling system in the body which tells your brain to stop eating as your stomach swells with food.⁴⁷

Acknowledging a recognised decline in overall physical activity, the World Health Organisation defines physical activity as 'all movements in everyday life, including work, recreation, exercise and sporting activities'.⁴⁸ For adults, it is generally accepted that there have been systematic reductions in energy expenditure due to there being fewer manual jobs, increases in car ownership and the use of labour saving devices both at home and at work. Measuring physical activity outside of the

⁴³ Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 29

⁴⁴ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science, Section 3.3, page 48

⁴⁵ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science, Section 3.3.1, page 49

⁴⁶ Wardle, J. (2007), Eating behaviour and obesity, *Obesity Reviews*, 8 (Suppl. 1), 73-75

⁴⁷ Speed of eating 'key to obesity', BBC News Channel, 22 October, 2008, <http://news.bbc.co.uk/1/health/7681458.stm>

⁴⁸ Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 25

workplace is difficult as focus has been on 'overt exercise'. This type of exercise seems to account for,

a very small proportion of total energy expenditure and is likely to play only a minor role in preventing obesity, although positive benefits on wider disease risk should not be ignored...attention has therefore focused on the importance of energy expended during routine daily activities as a contributor to overall energy expenditure.⁴⁹

Although there is evidence of reduction in children walking and cycling to school and decreased outdoor play due, in part, to parental fears of safety, the impact of changes on physical activity in children is "less clear".⁵⁰ It is recommended that children and young people have at least 60 minutes of at least moderate intensity physical activity each day and at least twice a week this should include activities to improve bone health, muscle strength and flexibility.⁵¹

The influence of the appropriate knowledge and skills on individual behaviour is also an issue. Being able to interpret and understand food labels can help people to make healthy choices, particularly with the increase of ready prepared foods in the diet. Research has also identified that inadequate cooking skills are a barrier to health eating in young people.⁵²

THE LIVING ENVIRONMENT – OBESOGENIC ENVIRONMENT

The environment in which we live has been described as being 'obesogenic'. The definition of obesogenic is "*the sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations*".⁵³ It is now generally accepted that environmental factors, including the built and food environments and technological developments can influence the availability and consumption of different foods and also influence the levels of physical activity taken by populations. In general,

the advancement of technology has tended to engineer physical effort out of the environment in the past few decades. This trend is widely apparent in the UK, in a built environment that decreases and disincentivises the need to walk, and in the decline of manual occupations.⁵⁴

Research has suggested a number of environmental factors that increase people's tendency to undertake physical activity. These factors, often lacking in suburban neighbourhoods, have all been cited as encouraging walking or cycling.⁵⁵

⁴⁹ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science, Section 3.3.1, page 49

⁵⁰ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science, Section 3.3.1, page 48

⁵¹ *Fit Futures: Focus on Food, Activity and Young People*, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 25

⁵² *Fit Futures: Focus on Food, Activity and Young People*, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 29

⁵³ Swinburn, B. et. al. (2002), Preventative strategies against weight gain and obesity, *Obesity Reviews*, 3(4), 289-301

⁵⁴ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science, Section 3.4, page 52

⁵⁵ Lake, A. and Townshend, T. (2006), Obesogenic environments: exploring the built and food environments, *The Journal of the Royal Society for the Promotion of Health*, 126(6), 262-267

- Increased residential densities;
- Neighbourhood design features, such as historic structures;
- Land-use mix, in particular local shops, services and schools within primary residential neighbourhoods;
- The presence and quality of pavements and footpaths;
- Enjoyable scenery;
- Perceptions of safety; and
- The presence of others.

Food environments include availability and accessibility to food, and food advertising and marketing. The workplace and particularly school environments have received much interest, for example, in the UK the television chef Jamie Oliver's campaign on school dinners resulted in 'dramatic government intervention and the banning of specific foods from school menus'.⁵⁶

It is proposed that the food environment and the built environment are closely related and that 'there is a need to consider these important obesity related factors together'⁵⁷ and that further work is required 'to examine how aspects of the built environment or building design influences people's food habits e.g. the proximity of shops to schools or the location of vending machines'.⁵⁸

In the North East of England an obesogenic network (north east obesogenic environment network, NEOeN) has been established to initiate integrated working partnerships within research, practice and the wider community. It regards tackling the obesogenic environment as looking at planning, design, transport, physical activity, food, culture and policy. The objective of NEOeN is to provide a networking facility across practice, academia and communities and it believes through cross sectoral partnerships there is the potential to impact on the rising obesity rates in the North East of England.⁵⁹

3.6 HEALTH INEQUALITIES

With regard to socioeconomic inequalities, patterns of obesity in the UK are seen to be in line with other high income countries. As rates of obesity have increased they have increased most among adults and children from poorer backgrounds, however the widening of obesity inequalities is more evident among women than men⁶⁰.

The emerging socioeconomic gradient of obesity in children is of particular concern as 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...weight gain

⁵⁶ Lake, A. and Townshend, T. (2006), Obesogenic environments: exploring the built and food environments, *The Journal of the Royal Society for the Promotion of Health*, 126(6), 262-267

⁵⁷ Lake, A. and Townshend, T. (2006), Obesogenic environments: exploring the built and food environments, *The Journal of the Royal Society for the Promotion of Health*, 126(6), 262-267

⁵⁸ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science, Section 3.4.3, page 54

⁵⁹ www.neoen.org.uk

⁶⁰ Law, C. et. al. (2007), Obesity and health inequalities, *Obesity Reviews*, 8 (Suppl. 1), 19-22

among parents may be amplifying the growth of childhood obesity through the generation of a repeating cycle.⁶¹

A number of reports indicate that age and gender have an impact on activity levels. 'For boys, activity levels remain the same until aged fifteen, but activity levels in girls decline significantly after the age of nine. After age fifteen, levels of physical activity decline for both sexes'.⁶²

Inequalities in obesity also vary by ethnic group. Asian children are more likely to be obese than white children and rates are higher among Black African, Black Caribbean and Pakistani women than in the general female population of the UK. Rates of adult obesity are lower than in the general population of the UK for men from ethnic minority groups with the exception of Black Caribbean and Irish men.⁶³

There is evidence to suggest that obesity may be more prevalent among people with disabilities, however it should be noted that disability can be a cause of obesity,

Higher rates of obesity have been found in adults, especially women, with mild to moderate learning disabilities that live in the community than in the general population...disability can impact...in a number of ways, including: different requirements in relation to energy intake, feeding difficulties, strong food preferences or by impacting on the ability to shop and cook....knowledge and understanding of health information can also present a barrier to healthy eating for people with a learning disability.⁶⁴

4. OBESITY IN NORTHERN IRELAND

4.1 LEVELS OF OBESITY

On 13th November 2008 at the opening of the All-Island Conference on Obesity ('Obesity: weighing up the evidence'), Health Minister Michael McGimpsey stated that,

There is no doubt that the obesity time bomb in Northern Ireland is ticking louder than ever. Our level of obesity, especially amongst our children is incredibly worrying...We will continue to work closely across jurisdictions, to share experience and expertise in order to make the best possible inroads into this shared problem.⁶⁵

The Minister's comments illustrate the fact that in recent years there has been a significant increase in levels of obesity and overweight among children and young people in Northern Ireland. At the same conference, Health Promotion Agency chief executive, Dr. Brian Gaffney citing figures from Northern Ireland's 2002 public health strategy *Investing for Health* stated that an estimated 450 deaths a year are

⁶¹ The changing social pattern of obesity, Public Health Research Consortium, Short Report 4, January 2008

⁶² Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 32

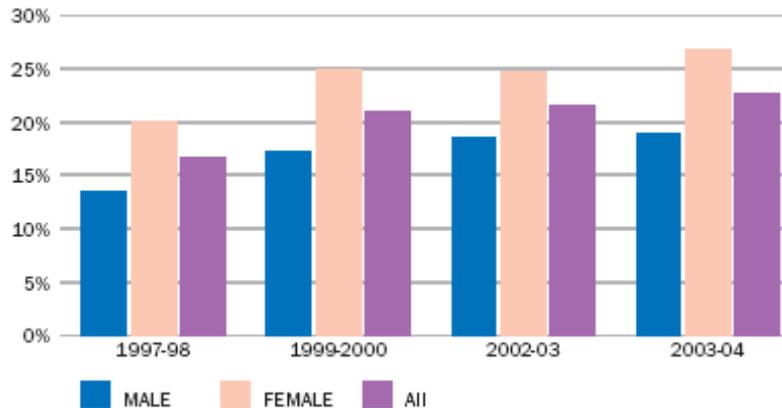
⁶³ Law, C. et. al. (2007), Obesity and health inequalities, *Obesity Reviews*, 8 (Suppl. 1), 19-22

⁶⁴ Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 35

⁶⁵ DHSSPS (2008) 'Obesity time bomb is ticking louder than ever – north and south', Press release.

attributable to obesity and that obesity costs the local economy approximately £500 million per year.

Figure 3: Percentage of children aged 41/2 to 51/2 in Northern Ireland classified as being overweight or obese⁶⁶



According to the Child Health System (managed by the Health and Social Services Boards) in 2003-04, one in four girls and one in five boys in Northern Ireland were found to be overweight or obese in Primary One. The percentage of children classified as obese in Primary One has increased year on year since 1997. According to the DHSSPS, more recent data shows that the level of obesity in Primary One has declined slightly since 2003-04 from 5.7 per cent of the age group to 5.1 per cent which is still comparatively high. Moreover, the *Young Hearts* study of 12 to 15 year olds living in Northern Ireland reported that levels of overweight and obesity increased in the decade 1990-2000.⁶⁷ Meanwhile, data from the Northern Ireland 2005-2006 Health and Social Wellbeing Survey revealed that 59 per cent of adults were overweight. In relation to obesity levels 25 per cent of men and 23 per cent of women were obese.⁶⁸

Table 1: Proportion of Adults overweight and obese in each Health and Social Services Board (HSSB) by gender⁶⁹

HSSB	Overweight			Obese		
	All	Male	Female	All	Male	Female
Eastern	32 %	36 %	29 %	21 %	21 %	21 %
Northern	37 %	38 %	35 %	26 %	27 %	24 %
Southern	35 %	41 %	29 %	28 %	27 %	28 %
Western	36 %	44 %	28 %	23 %	26 %	21 %

⁶⁶ DHSSPS (2005) *Fit Futures – Focus on Food, Activity and Young People*, DHSSPS: 6.

⁶⁷ International Journal of Obesity (2005) *Ten year trends for fatness in Northern Irish adolescents: the Young Hearts Projects, repeat cross-sectional study*, 29: 579-585 – cited in NIAO (2007) *The Performance of the Health Service in Northern Ireland*, NIAO: 14.

⁶⁸ NISRA (2006) *Northern Ireland Health and Social Wellbeing Survey 2005-2006 – Topline Results – Adult Obesity* – document available electronically at: http://www.csu.nisra.gov.uk/adult_per_cent20obesity.pdf

⁶⁹ Statistics from the Health and Wellbeing Survey 2005-06 compiled by the Public Health Information and Research Branch.

4.2 IMPACT OF OBESITY IN NORTHERN IRELAND – HEALTH AND ECONOMIC COSTS

The rising proportion of overweight and obese children, young people and adults in Northern Ireland demonstrates the scale of the problem. Over the past three decades, the population has steadily become accustomed to living in an obesogenic environment which encourages excessive food consumption while simultaneously decreasing opportunities for engaging in regular physical activity. Similar to the consequences in other parts of the UK and in the Republic of Ireland, there are significant implications associated with increasing obesity prevalence relating to population health and the direct and indirect economic costs.

According to *Investing for Health*, the cost attributable to a lack of physical activity includes over 2,100 deaths per annum equivalent to over 18,000 life years lost and 1.2 million working days lost each year.⁷⁰ Meanwhile, in his presentation to the HSSPS Committee, Dr Michael Ryan, Consultant Chemical Pathologist based within the Northern Health and Social Services Board stated that, approximately 750,000 people in Northern Ireland are either overweight or obese, with around 20 per cent of adolescents comprising this figure. Critically, he stated that due to the all-pervasive nature of the obesity problem (the majority of patients attending diabetic, cardiac, angina, vascular, respiratory and morbidity clinics have obesity as a significant underlying pathology) demands placed on the health service associated with treating the condition mean that obesity is effectively ‘clogging up’ a wide range of clinical services at community, primary and secondary care levels. Dr Ryan also argued that, ‘current attempts to address lifestyle change lack coordination into a central and manageable strategy [and]...because of a lack of services specifically targeted at obesity, the clinical and cost-effectiveness of other interventions is seriously compromised.’⁷¹

In the same presentation Dr Ryan alluded to the fact that there are significant cost implications for health systems in treating obesity and those diseases which are often associated with this condition. He referred to Scotland where around £170 million is spent per year in the treatment of obesity.⁷² In terms of the financial impact of obesity in Northern Ireland, there is clearly a significant cost on the health service as well as wider society and the economy. It is estimated that between 30,000 and 50,000 people in Northern Ireland have diabetes and that this will double over the next decade. Treatment and care of diabetes accounts for around 5 per cent of health expenditure and a total of 20 per cent of hospital in-patient resources.⁷³

By way of comparison it is worth considering the escalating costs of treating obesity within the largest health system in the UK – the English NHS. According to a Kings Fund report, the cost of treating obesity was approximately £47.5 million in 2002, a significant rise on the 1998 figure of £9.5 million which was largely attributable to rising drug costs. Additionally, the costs of treating diseases caused by obesity (such as coronary heart disease and type 2 diabetes) were estimated at between £945 million and £1,075 million in 2002. By 2007, the cost of prescriptions for all diabetes-

⁷⁰ DHSSPS (2002) *Investing for Health*, DHSSPS.

⁷¹ Presentation to the HSSPS Committee by Dr Michael Ryan, Miss Cheryl Flanagan and Mrs Donna Hanna, 29th September 2008.

⁷² Presentation to the HSSPS Committee by Dr Michael Ryan, Miss Cheryl Flanagan and Mrs Donna Hanna, 29th September 2008.

⁷³ DHSSPS (2005) *Fit Futures – Focus on Food, Activity and Young People*, DHSSPS: 46.

related drugs had increased to more than £594 million, up 7 per cent on the previous year.⁷⁴

The authors of the report make an important point in relation to the long-term financial burden of obesity on the NHS. They argue that, 'if action is not taken, the financial cost to the NHS will grow and, according to Wanless [in his 2004 report]⁷⁵ could make the NHS itself unsustainable. This is why investing in effective behaviour change interventions is more important than ever'.⁷⁶

4.3 DEVELOPING A STRATEGIC POLICY RESPONSE TO OBESITY IN NORTHERN IRELAND

Unlike England but similar to Scotland, Wales and the Republic of Ireland, there is currently no comprehensive obesity strategy being implemented in Northern Ireland. At present, of all the devolved regions, only England has a population-wide obesity specific strategy. While no population-wide strategies tackling obesity are currently being implemented, obesity is recognised as a priority in a number of key public health documents within the devolved jurisdictions. Additionally, interventions to address obesity have been incorporated in diet and nutrition and/or physical activity policy or strategy documents.⁷⁷

4.3.1 Progressing *Fit Futures* - Developing a coherent policy framework

In response to the increasing levels of obesity, particularly among children and young people in Northern Ireland, a cross-departmental taskforce was established in August 2004 by the Ministerial Group on Public Health (MGPH). The culmination of the Taskforce's work to examine ways to reduce the prevalence of obesity among children and adolescents in Northern Ireland was the publication of *Fit Futures – Focus on Food, Activity and Young People* in December 2005. *Fit Futures* built on the previous 2002 commitment by the DHSSPS outlined within *Investing for Health* to stop the increase in the levels of obesity in men and women by 2010.⁷⁸ Currently, the central target driving the anti-obesity strategic agenda in Northern Ireland is that contained within the Public Service Agreement (PSA) 8 outlined with the Executive's Programme for Government 2008-2011. PSA 8 aims to 'promote health and address health inequalities' and in doing has established a target:

- By 2011, halt the rise in obesity.

Significantly, within *Fit Futures*, the Taskforce identified 6 priority areas (see below) which they recommended that 'because of the health and financial consequences of inaction should be implemented as a matter of priority'.⁷⁹ These 6 priorities for action are detailed below:

Develop joined-up healthy public policy

⁷⁴ Boyce, T., Robertson, R. and Dixon, A. (2008) *Commissioning and Behaviour Change – Kicking Bad Habits final report*, Kings Fund: 1.

⁷⁵ Wanless, D. (2004) *Securing Good Health for the Whole Population – Final Report*, HM Treasury.

⁷⁶ Boyce, T., Robertson, R. and Dixon, A. (2008) *Commissioning and Behaviour Change – Kicking Bad Habits final report*, Kings Fund: 1.

⁷⁷ Musingarimi, P. (2008) *Obesity in the UK: A Review and Comparative Analysis of Policies within the Devolved Regions*, international Longevity Centre: 13.

⁷⁸ DHSSPS (2002) *Investing for Health*, DHSSPS: 61.

⁷⁹ DHSSPS (2005) *Fit Futures – Focus on Food, Activity and Young People*, DHSSPS: 11.

- address disjointed approach to promotion of physical activity, sport and leisure;
- address conflicting policies sometimes being promoted by government departments and agencies in relation to food policy and the food industry

Provide real choice

- food industry should respond to introduction of controls on advertising and promotion of foods to children;
- food industry should introduce agreed nutritional signposting system;
- create demand for healthy options through public sector food procurement;
- tackle barriers to healthy food;
- opportunities for active play should be available and accessible

Support healthy early years

- extend healthy schools programme to early years settings;
- establish common standards for nutrition and physical activity in these settings and monitor compliance;

Create healthy schools

- integrate health improvement planning into school development planning;
- develop active schools programme

Encourage development of healthy communities

- community based approaches such as Health Action Zones

Build on evidence base

- systematic surveillance of obesity levels, nutrition and activity levels⁸⁰

An implementation plan for *Fit Futures* was issued for consultation in early 2007 which set out a range of key tasks and target dates under the 6 priority areas. In February 2008, a DHSSPS-led Obesity Prevention Steering Group (OPSG) was established to oversee implementation and significantly to work on the development of an adult obesity strategy. This cross-sectoral group contains representation from practitioners, policy makers and researchers and has responsibility for monitoring the implementation of the 70 recommendations in *Fit Futures*.

Building on the focus on childhood obesity in *Fit Futures*, the OPSG is leading the development of a life course approach to obesity treatment and prevention. A key component is the establishment of four policy Advisory Groups with each group designated a key area – physical activity, food and nutrition, education and prevention, and data and research. According to the NIAO, this work will facilitate an informed, research-led integrated approach to address obesity and associated conditions.⁸¹

⁸⁰ Northern Ireland Audit Office (NIAO) (2008) *The Performance of the Northern Ireland health service*, NIAO, October.

⁸¹ Northern Ireland Audit Office (NIAO) (2009) *Obesity and Type 2 Disorders in Northern Ireland*, NIAO: 20.

According to the authors of the *Fit Futures* report, stakeholders strongly suggested that the recommendations should be operationalised through building on existing structures and programmes. Moreover, one of the key messages that emerged from the *Fit Futures* process was the need to support a much more joined-up, coordinated approach to address the underlying causes of overweight and obesity. Subsequently, a number of different initiatives were coordinated and implemented through the HSSB-based Investing for Health Partnerships that have mainly focused on the school environment to raise awareness around the issue of obesity and promoting better nutrition and regular physical activity.

4.3.2 NIAO Report on Obesity and Type 2 Diabetes (2009)

Despite progressing the *Fit Futures* recommendations, the DHSSPS's obesity policy agenda has received criticism from the Northern Ireland Audit Office (NIAO) in their recent report into the prevalence of Obesity and Type 2 Diabetes in Northern Ireland. According to the report,

Fit Futures called for measures to ensure that an effective evidence base on obesity risk factors was developed. However after three years, progress on this recommendation has been slow. In our view, the Department has to be at the forefront, of efforts to define and implement a regional surveillance strategy for obesity and its links with chronic disease, in particular Type 2 diabetes. It is important that the Department takes timely action to introduce a health monitoring survey to better understand the eating habits, physical activity and related biomedical health indicators of the population of Northern Ireland.⁸²

In addition to these comments, the NIAO report also put forward a number of other recommendations to ensure the successful development of a more coherent policy framework in tackling obesity and Type 2 Diabetes:

- Include and deliver programmes demonstrated by research to be effective;
- Provide enough resources to deliver programmed with real impact and sufficient coverage of the region;
- Ensure effort and investment can be sustained enough to get results;
- Set specific objectives and targets relating to health eating for target population groups;
- Provide ongoing measures of success;
- Have the flexibility to reallocate or increase resources in response to emerging evidence on performance and the target outcomes; and
- Ensure that the governance arrangements covering the whole-of-government nature of its approach to obesity and diabetes are capable of driving effective outcomes.⁸³

⁸² Northern Ireland Audit Office (2009) *Obesity and Type 2 Diabetes in Northern Ireland*, NIAO: 22-23.

⁸³ Northern Ireland Audit Office (2009) *Obesity and Type 2 Diabetes in Northern Ireland*, NIAO: 21-22.

4.3.3 Adopting a Life Course Approach to tackle obesity

A key task for the Obesity Prevention Steering Group has been to extend the child-centred focus of *Fit Futures* to the development of a whole-population obesity strategy. An important dimension of this work has been the adoption of a ‘life course’ approach to tackle obesity.

According to Musingarimi, ‘the ‘life course’ approach to tackling overweight and obesity views the action and behaviour of individuals in the context of the continuum of their lives from birth to death, and transition through various life stages and transition points.’ In recent years, the majority of strategic approaches employed in tackling obesity levels have focused on children and young people mainly within the school environment. Recent research conducted by the UK Government’s *Foresight* project identifying approaches to tackle obesity, has advocated the employment of a life course approach as it recognises the important factor of age in preventing and treating obesity. An important observation relating to the development of a strategic approach to tackling obesity is that ‘the generational nature of obesity means thinking about a different strategy for different generations as options change. This also means thinking about long-term goals such as how to integrate health more into food culture, values and habits – which would take some time.’⁸⁴

5. INTERVENTIONS AND TREATMENTS FOR OBESITY

5.1 INTERVENTIONS – INTRODUCTION AND GENERAL APPROACHES

It is envisaged that implementing solutions for obesity is likely to require ‘unprecedented change [with the] involvement of partners outside traditional health sectors’. It is also likely that ‘interventions to prevent obesity will have to take place when the evidence is neither complete nor perfect. Instead, the evidence base needs to develop alongside the delivery of novel interventions, informed by the available evidence and strengthened by expert advice.’⁸⁵

The evidence to date indicates stages in life where there are natural opportunities to influence behaviour to prevent obesity. These stages include periods of ‘metabolic plasticity’ (e.g. early life and pregnancy); times linked to major change (e.g. leaving home, becoming a parent); and times when there are major attitude changes (e.g. peer group influence). ‘Breast feeding and early growth patterns provide the only period in which there is clear evidence to support the concept of a critical period of development associated with long-term consequences’⁸⁶.

Children are often considered ‘the priority population for intervention strategies because, firstly, weight loss in adulthood is difficult and there are a greater number of potential interventions for children than for adults. Schools are a natural setting for influencing the food and physical activity environments of children. Other settings such as preschool institutions and after-school care services will have similar opportunities for action’⁸⁷.

⁸⁴ Butland, B. *et al.* (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science: 134.

⁸⁵ Butland, B. *et al.* (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science, Section 4.1, page 62

⁸⁶ Butland, B. *et al.* (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science, Section 4.1.1, page 62

⁸⁷ Dehghan, M. *et al.* (2005), Childhood obesity, prevalence and prevention, *Nutrition Journal*, 4, 24, www.nutritionj.com/content/4/1/24

The Northern Ireland Fit Futures taskforce has identified a number of general approaches that 'should be taken into account when developing new policies and initiatives to tackle obesity and when refining existing policies and programmes' as follows:⁸⁸

- The importance of parents and families and making a good start – 'with parents have a major impact on their child's eating and physical activity patterns';
- Supporting the development of basic skills – 'children, young people and their parents need to have the knowledge and understanding of why healthy eating and active living are important. They also need to be able to differentiate between healthy and less healthy choices and they need the basic skills and confidence to select and adopt healthy choices';
- Making a long-term commitment – 'participants in Fit Futures were strongly of the view that to prevent levels of overweight and obesity from continuing to rise a sustained, co-ordinated effort would be required from throughout the public, private, voluntary and community sector';
- Leading by example – 'the role of government procurement in creating a demand for healthy options was highlighted as an important area for action', e.g. meals in schools and hospitals and contents of vending machines in leisure centres, schools and hospitals;
- Adopting a population approach but responding to need – it is important that 'policies and strategies should utilise approaches that enable access to all relevant population groups';
- Being positive and promoting self-esteem – 'a positive approach to obesity prevention is in line with current policies to promote good mental and emotional health and well-being';
- Being evidence based – 'the absence of a comprehensive evidence base should not prevent action now, but rather highlights the need for more rigorous evaluation of new policies and programmes in the future'.

In 2006, The National Institute for Health and Clinical Excellence (NICE) published a clinical guideline on obesity. The following key priorities for implementation of the guidance are directly extracted from the guideline and illustrate the main areas and situations where NICE propose that certain interventions are most beneficial⁸⁹:

Key priorities for implementation

The prevention and management of obesity should be a priority for all, because of the considerable health benefits of maintaining a healthy weight and the health risks associated with overweight and obesity.

Public health

NHS - Managers and health professionals in all primary care settings should ensure that preventing and managing obesity is a priority, at both strategic and delivery levels. Dedicated resources should be allocated for action.

⁸⁸ Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, Priority Approaches, pages 59 - 73

⁸⁹ NICE Clinical Guideline 43, Obesity: guidance on the prevention, identification, assessment and management of overweight and obesity in adults and children, Dec. 2006, www.nice.org.uk/CG043, pages 8-11

Local authorities and partners - Local authorities should work with local partners, such as industry and voluntary organisations, to create and manage more safe spaces for incidental and planned physical activity, addressing as a priority any concerns about safety, crime and inclusion, by, for example, providing facilities and schemes such as cycling and walking routes, cycle parking, area maps and safe play areas; making streets cleaner and safer; ensuring buildings and spaces are designed to encourage people to be more physically active; and considering in particular people who require tailored information and support.

Early years settings - Nurseries and other childcare facilities should minimise sedentary activities during play time, and provide regular opportunities for enjoyable active play and structured physical activity sessions; and implement Department for Education and Skills, Food Standards Agency and Caroline Walker Trust¹ guidance on food procurement and healthy catering.

Schools - Head teachers and chairs of governors, in collaboration with parents and pupils, should assess the whole school environment and ensure that the ethos of all school policies helps children and young people to maintain a healthy weight, eat a healthy diet and be physically active, in line with existing standards and guidance.

Workplaces - Workplaces should provide opportunities for staff to eat a healthy diet and be physically active, through, for example, active and continuous promotion of healthy choices in restaurants, hospitality, vending machines and shops for staff and clients; and a supportive physical environment, such as improvements to stairwells and providing showers and secure cycle parking.

Self-help, commercial and community settings – Primary care organizations and local authorities should recommend to patients, or consider endorsing self-help, commercial and community weight management programmes.

Clinical care

Children and adults - Multicomponent interventions are the treatment of choice to include behaviour change strategies to increase physical activity levels or decrease inactivity, improve eating behaviour and the quality of the person's diet and reduce energy intake.

Children - Interventions for childhood overweight and obesity should address lifestyle within the family and in social settings. Body Mass Index (BMI) (adjusted for age and gender) is recommended as a practical estimate of overweight in children and young people, but needs to be interpreted with caution because it is not a direct measure of adiposity. Referral to an appropriate specialist should be considered for children who are overweight or obese and have significant comorbidity or complex needs (for example, learning or educational difficulties).

Adults - The decision to start drug treatment, and the choice of drug, should be made after discussing with the patient the potential benefits and limitations. When drug treatment is prescribed, arrangements should be made for appropriate health professionals to offer information, support and counselling on additional diet, physical activity and behavioural strategies. Information about patient support programmes should also be provided.

Bariatric surgery is recommended as a treatment option for adults with obesity if all of the [NICE] criteria are fulfilled. Bariatric surgery is also recommended as a first-line option (instead of lifestyle interventions or drug treatment) for adults

with a BMI of more than 50 kg/m² in whom surgical intervention is considered appropriate.

5.2 INTERVENTIONS FOR INDIVIDUALS – PRIMARY CARE

An evidence-based Care Pathway for the management of overweight and obesity in primary care was published by the NHS in 2006.⁹⁰ For adults, the priority of intervention in primary care is reducing risk factors for the patient 'rather than to return them to an 'ideal' or healthy weight range'.⁹¹ This acknowledges the fact that small weight losses do produce health benefits, however that more significant changes result after a loss of 5-10 per cent of body weight. The aim is also to prevent further weight gain in patients with lower degrees of overweight. To achieve these aims, first-line primary care management is to help a patient with specific advice to:⁹²

- reduce calorie intake;
- increase physical activity and reduce sedentary behaviours; and
- increase self-awareness about day-to-day behaviours that affect calorie intake and activity levels and combine advice in diet and physical activity with behavioural strategies e.g. avoidance of stimuli to overeating, such as not walking past the fish and chip shop, no longer keeping crisps in the house.

This primary care emphasis on reducing risk factors for the patient is highlighted by some researchers who propose that 'in view of the limited success rates of all weight-loss strategies to date...where previous dieting attempts have failed, better outcomes and health improvements will arise from advocating weight stability goals. This means the promotion of weight maintenance (to ensure any reduction in weight is maintained) and weight constancy (where steps are taken to maintain existing weight without attempting weight loss)'.⁹³

Anti-obesity drug therapy is considered as an addition, rather than an alternative to, lifestyle intervention. Both Orlistat and Sibutramine are currently in use in the UK for obesity treatment in accordance with NICE guidelines for prescribing the drugs:⁹⁴

- Orlistat inhibits the action of pancreatic lipase enzymes in the gastrointestinal system and must be used in conjunction with a low fat eating plan as failure to do so results in gastrointestinal side effects such as diarrhoea;
- Sibutramine is a satiety enhancer which 'works on the central nervous system by altering the chemical messages that control how a person feels and thinks about food'.

Regarding drug therapy, researchers have noted that,

⁹⁰ www.library.nhs.uk/SpecialistLibrarySearch/Download.aspx?resID=270413

⁹¹ NHS, Care pathway for the management of overweight and obesity, May 2006, www.library.nhs.uk/SpecialistLibrarySearch/Download.aspx?resID=270413 page 6

⁹² NHS, Care pathway for the management of overweight and obesity, May 2006, www.library.nhs.uk/SpecialistLibrarySearch/Download.aspx?resID=270413 pages 7-9

⁹³ Pryke, R. and Docherty, A. (2008), Obesity in primary care: evidence for advising weight constancy rather than weight loss in unsuccessful dieters, *British Journal of General Practice*, 58(547), 112-117.

⁹⁴ NHS, Care pathway for the management of overweight and obesity, May 2006, www.library.nhs.uk/SpecialistLibrarySearch/Download.aspx?resID=270413 page 10

none of the available agents has the capacity to spontaneously change the body weight set-point without any specific dietary restriction...however [they can help in] achieving and maintaining effective weight reduction, although not all individuals are good responders to anti-obesity drug therapy...Discovery of new pharmacological alternatives, leading to greater efficacy in the promotion of weight reduction without affecting safety, is still the main objective for the treatment of obesity.⁹⁵

The *Counterweight* programme is a good practice example of a primary care weight management programme. It is described as 'the only fully evaluated, evidence based weight management programme within the UK – possibly worldwide'⁹⁶. The model is based on Weight Management Advisers (dietitians specialising in obesity management), working in Primary Care Trusts training and supporting healthcare staff to put the programme into action. Lifestyle intervention is the first-line approach (with individuals or groups) and second-line interventions may include anti-obesity drugs, referral to a dietitian, psychologist or secondary care service. Local dietitians are involved to take over once the model is implemented and it is anticipated that each trained practice could treat 50 patients a year.⁹⁷

The NHS Care Pathway notes that, 'if a person does not respond to first-line management', they are considered for referral to 'specialists such as dietitians, psychologists, physiotherapists and/or specialist weight management clinics. Surgery is generally considered for obesity only after all other interventions have been exhausted'.⁹⁸

One good practice example of a *Primary Care Specialist Obesity Service*, established to treat people with morbid obesity within a primary care setting, is that established by Birmingham East and North PCT. The aim of the level 3 service is to provide more intensive specialist support, than would generally be possible in a primary care setting, from a multi-professional team. The patients of this service are those who have failed to control their weight at the level 2 service (community/primary care weight management service) and to provide a gateway to level 4 services (secondary care morbid obesity service).⁹⁹

5.3 INTERVENTIONS FOR INDIVIDUALS – SECONDARY CARE (BARIATRIC SURGERY)

Bariatric surgery has increased 'more than five-fold within 5 years in most developed countries. In parallel evidence is accumulating that surgically induced weight loss provides a survival benefit for morbidly obese patients. In two recent cohort studies...bariatric surgery compared with conservative management reduced long – term mortality in morbidly obese patients'.¹⁰⁰ These cohort studies were carried out in Sweden and the U.S. and they 'separately found that obese people who

⁹⁵ Scheen, A.J. (2008), The future of obesity: new drugs versus lifestyle interventions, *Expert Opinion, Investigating Drugs*, 17(3), 263-267.

⁹⁶ www.counterweight.org

⁹⁷ www.counterweight.org/PCTInfo.html

⁹⁸ NHS, Care pathway for the management of overweight and obesity, May 2006, www.library.nhs.uk/SpecialistLibrarySearch/Download.aspx?resID=270413 page 11.

⁹⁹ <http://domuk.org/wp-content/uploads/2008/05/ben-pct-primary-care-specialist-obesity-service-march-08.ppt>

¹⁰⁰ Korenkov, M. and Sauerland S. (2007), Clinical Update: bariatric surgery, *The Lancet*, 370, 1988-1990

underwent drastic surgery had a 30 percent to 40 percent lower risk of dying seven to 10 years later compared to those who did not have such operations'.¹⁰¹

It is one medical view that such surgery should be offered to overweight people as a form of disease prevention and not just carried out on the morbidly obese and that, 'at least ten times as many people who currently have gastric bypass operations on the NHS already qualify for one under the Government's own guidelines'¹⁰².

Bariatric procedures can be divided into those that reduce food intake (gastric restrictions) and those that reduce food uptake from the digestive tract (malabsorption). The two most common procedures worldwide are the adjustable gastric banding and Roux-en-Y gastric bypass, 'both approaches have strong support among bariatric surgeons', however 'it is important that knowledge and skills are concentrated in bariatric surgery centres. Mortality in high-volume centres is lower than in low-volume centres'.¹⁰³

In the UK there are guidelines for adults from NICE about who should be considered for bariatric surgery (surgery is not generally recommended for young people but may be considered in exceptional circumstances):¹⁰⁴

- BMI is greater than or equal to 40 or 35-40 Kg/m² with other significant disease e.g. type 2 diabetes, that could be improved by weight loss, and:
 - All appropriate non-surgical measures have failed to achieve or maintain adequate clinically beneficial weight loss for at least 6 months;
 - They are receiving or will receive intensive specialist management;
 - They are generally fit for anaesthesia and surgery;
 - They commit to the need for long-term follow-up;
- As a first-line option if BMI is more than 50 Kg/m² and surgical intervention is considered appropriate.

5.4 COMMUNITY INTERVENTIONS – GOOD PRACTICE EXAMPLES

5.4.1 Northern Ireland

The following are some examples of good practice and are taken from *Fit Futures: Focus on Food, Activity and Young People*, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, (2005).

Western Investing for Health Partnership – Health Promoting Homes

The initiative was established to tackle obesity in children and in families in areas of disadvantage in Strabane and Castlederg. It offered participants 'an integrated

¹⁰¹ Benefits of weight-loss surgery, National Obesity Forum, www.nationalobesityforum.org.uk/obesity-news-centre-mainmenu-183/research-reports-mainmenu-186/326-benefits-of-weight-loss-surgery.html

¹⁰² Surgery is 'only means to healthy weight loss' The Independent, 9 Sept. 2008, <http://www.independent.co.uk/life-style/health-and-wellbeing/health-news/surgery-is-only-means-to-healthy-weight-loss-923481.html>

¹⁰³ Korenkov, M. and Sauerland S. (2007), Clinical Update: bariatric surgery, *The Lancet*, 370, 1988-1990

¹⁰⁴ www.patient.co.uk/showdoc/40025123

programme to support personal development, including the development of knowledge and practical skills on issues such as breastfeeding, nutrition and oral health and physical activity'.¹⁰⁵

Craigavon Borough Council – Physical Activity

With the support of partners from the sport and health sectors, Craigavon Borough Council is encouraging participation in physical activity by those not usually involved. For example, a school-based dance and physical activity programme for teenage girls called 'Teenage Kicks' has been delivered to over 1000 girls in local schools; over-50's clubs at local leisure centres; "Rusty Rackets" tennis programme; and a training scheme to accredit 'walk' leaders.¹⁰⁶

Cherish Sure Start Project – Irvinestown

The Big Cook Little Cook programme, facilitated by a Cook It! Tutor involves a number of 2-hour sessions over a 4-week period on healthy eating and food hygiene for parents and children to do together. The aim is to 'help both parents and children to make informed choices'.¹⁰⁷

Decent Food for All – Armagh and Dungannon Health Action Zone

This is a 3-year partnership project, funded by *safefood*, the Food Safety Promotion Board and the food Standards Agency which aims to 'encourage and support local communities, families and individuals to achieve a balanced, safe diet by providing practical, community-based and focused help and advice on food issues and nutrition'. It is delivered within 12 target wards across Armagh and Dungannon.¹⁰⁸

Active Communities

In 2005 the Sports Council for NI, in partnership with the Big Lottery fund, launched a community sport programme targeting the 25 per cent of Northern Ireland's most deprived electoral wards and groups, including older people and people with disabilities. A Community Sports Development Officer is to plan and deliver a range of activities that meet local needs, especially of disadvantaged groups.¹⁰⁹

5.4.2 Other UK Examples

Change4Life

Change4Life is a Department of Health initiative and is described as 'a society-wide movement that aims to prevent people from becoming overweight by encouraging them to eat better and move more'. Its advertising campaign began in January 2009 and talks about 'fat in the body' rather than fat bodies in order to make clear the links

¹⁰⁵ Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 77

¹⁰⁶ Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 81

¹⁰⁷ Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 98

¹⁰⁸ Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 118

¹⁰⁹ Fit Futures: Focus on Food, Activity and Young People, Report to the Ministerial Group on Public Health (Northern Ireland), DHSSPS, Dec. 2005, page 119

between fat and preventable illness. It also 'pins the blame on modern life, which affects all of us, rather than pointing the finger at parents'.¹¹⁰ Individual families are encouraged to join *Change4Life* via the website to receive information, games, tools, tips, a welcome pack and updates about what is happening in local communities. The suggestions for families are centred around the following areas:¹¹¹

- Up and about ("why kids shouldn't veg out and how to get them out and about");
- 5 A Day (making 5 portions of fruit and veg a day easy);
- Meal time (the importance of 3 regular meals);
- 60 active minutes (children should be active for 60 minutes per day);
- Snack check (reducing unhealthy snacking)
- Me size meals (the right sized portions for children's ages);
- Cut back fat (easy ways to lower fat in the family diet); and
- Sugar swaps (ways to help children eat less sugar).

As part of the *Change4Life* campaign, nine towns/areas in England (Dudley, Halifax, Sheffield, Tower Hamlets (London), Thetford (Norfolk), Middlesbrough, Manchester, Tewkesbury and Portsmouth) are sharing in £30m to become 'healthy towns'. The areas will all match the government funding to develop a range of schemes related to healthy living. For example, in Manchester Points4Life is a loyalty scheme to reward people with free activities or healthy food when they take exercise. Other initiatives include 'cut-price promotions on fruit and vegetables and breakfast clubs in deprived areas'.¹¹²

MEND (Mind, Exercise, Nutrition...Do It!)

MEND is an organisation dedicated to reducing global childhood overweight and obesity levels. The MEND programme was developed at the Great Ormond Street Hospital for Children and the University College London Institute of Child Health. Together with its partners (public, private, voluntary and academic). MEND offers local healthy living programs to families.

There is a MEND programme for 7-13 year olds who are overweight (It runs twice a week after school in two-hour sessions over 10 weeks. The 20 MEND Programme sessions include an hour's interactive workshop for children and parents, and an hour's exercise for the children whilst the parents have an adult discussion) and a Mini-MEND programme for 2-4 year olds, whatever their weight (Mini-MEND's ten weekly 90 minute sessions combine parent-toddler active play, parent discussion groups and children's crèche-style creative play activities. They take place during the daytime at community venues such as leisure centres and Sure Start Children's Centres)¹¹³. MEND are also aiming to develop effective and research-based obesity prevention and treatment programmes, training and resources.

WATCH IT

WATCH IT is an NHS Community Programme for children and teenagers in Leeds having difficulty with their weight. It is a year long intervention made up of bronze, silver and gold awards which are completed in succession. The WATCH IT trainers

¹¹⁰ www.dh.gov.uk/en/News/Currentcampaigns/Change4life/index.htm

¹¹¹ www.nhs.uk/change4life/Pages/make.aspx

¹¹² Nine 'healthy towns' get £30m pot, BBC News Channel, 10th November 2008,

<http://news.bbc.co.uk/1/hi/health/7719304.stm>

¹¹³ www.mendprogramme.org

work with the family and are specially trained in nutrition and physical activity and have access to dieticians, sports experts, psychologists and children's nurses to ensure the best advice. They meet with the families involved individually to assist with making the changes in nutrition and activity required.¹¹⁴

Carnegie Camps

Carnegie International Camp (as part of the non-profit organisation Carnegie Weight Management) was devised at Leeds Metropolitan University in 1999 as 'Britain's first residential weight loss summer camp for overweight and obese children'. It has continued to grow in a variety of ways in terms of both staff numbers and services offered. In addition to the summer camps there are now Carnegie Day Camps that run from 1-7 weeks in the summer and Carnegie Clubs, a community programme that runs all year. Young people and family members attend the 12-week programme for several hours a week to learn the 'basics of healthy lifestyles and have the opportunity to try new activities to bring the fun back into exercise'.¹¹⁵

Commercial programmes

There are numerous commercial weight loss programmes in operation world-wide. The effectiveness of four of the main programmes available to adults in the UK, Dr Atkins new diet revolution, Slim-Fast Plan, Weight Watchers pure points programme and Rosemary Conley's eat yourself slim diet and fitness plan, were evaluated in a 'six month multicentre randomised unblended controlled trial'. All the diets resulted in significant loss of body fat and weight over six months compared with the control group. The average weight loss was 5.9Kg and average fat loss was 4.4 Kg over six months. The trial concluded that, 'clinically useful weight loss and fat loss can be achieved in adults who are motivated to follow commercial diets for a substantial period. Given the limited resources for weight management in the NHS, healthcare practitioners should discuss with their patients programmes known to be effective'.¹¹⁶

5.4.3 International Examples

Reviews of evidence from other countries suggest that specific actions can be useful but 'without overall coherence in policy and clear political drivers, they are most unlikely to deliver the required level of change....interventions in school settings suggest that a 'whole-school' approach (meal services, vending, class teaching, physical education, out-of-school activities) is more likely to be successful than one targeting individual children'.¹¹⁷ Some specific international good practice examples of community and school interventions are described in Appendix 1 from Australia, Canada, China, France, New Zealand, Norway, Sweden and the U.S.

6. 'BUILDING A SUSTAINABLE RESPONSE' (FORESIGHT REPORT (2007))

In October 2007, the *Foresight Tackling Obesities: Future Choices Project* published a report advocating the development of a coherent and comprehensive approach to

¹¹⁴ www.watchit.nhs.uk/?about.different

¹¹⁵ <http://carnegiweightmanagement.com/programmes/>

¹¹⁶ Truby, H. et. al. (2006), Randomised controlled trial of four commercial weight loss programmes in the UK: initial findings from the BBC 'diet trials', BMJ, <http://www.bmj.com/cgi/content/abstract/332/7553/1309>

¹¹⁷ Butland, B. et. Al. (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science, Section 3, page 73

confronting the obesity problem in the UK. Based within the UK Government Office for Science the central aim of the obesity project is 'to produce a long-term vision of how we can deliver a sustainable response to obesity in the UK over the next 40 years.'¹¹⁸

The UK-wide project has strongly influenced the development of obesity strategies including the publication of *Healthy Weight, Healthy Lives: A Cross-Government Strategy for England* in January 2008. The report put forward a number of key recommendations including the identification of a set of 'core principles' that are crucial in the configuration of a coherent and comprehensive response to tackling obesity.¹¹⁹ These are:

1. A system-wide approach, redefining the nation's health as a societal and economic issue
2. Higher priority for the prevention of health problems, with clearer leadership, accountability, strategy and management structures
3. Engagement of stakeholders within and outside Government
4. Long-term, sustained interventions
5. Ongoing evaluation and a focus on continuous improvement¹²⁰

In addition to these core principles the *Foresight* report makes a number of other important observations and recommendations which it contends are critical to understanding the complexities of obesity and in developing a successful long-term strategy.

- Obesity arises primarily from a systematic shift in the wider environment, with corresponding effects on group and individual behaviour, against the backdrop of an obesity system where biological drivers favour weight gain. A sustainable response would create a scenario in which social and individual priorities favour healthy behaviours and where underlying biological mechanisms to control body weight are continually reinforced. A key feature of this response is that it places the concept of energy balance at the heart of a broad range of determinants of health.¹²¹
- Taken together, the evidence presented in this report provides a powerful challenge to the commonly held assumption that an individual's weight is a matter solely of personal responsibility or indeed individual choice. Rather, the evidence supports the concept of 'passive obesity' (where obesity is encouraged by wider environmental conditions, irrespective of volition). As society has changed over the last three decades energy expenditure and physical activity has declined. Today, the majority of people in the UK are sedentary when at work and at home. Most are car owners. Patterns of food consumption have also changed markedly. Eating habits have become more

¹¹⁸ See *Tackling Obesities: Future Choices Project* website at:

<http://www.foresight.gov.uk/OurWork/ActiveProjects/Obesity/Obesity.asp>

¹¹⁹ Also see the tables in Appendix 2 for the Foresight Report's 'Criteria checklist for an effective obesity strategy'.

¹²⁰ Butland, B. *et al.* (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science: 128.

¹²¹ Butland, B. *et al.* (2007) *Obesities: Future Choices – Project Report*, Second Edition, Foresight, Government Office for Science: 120.

unstructured, and low-cost, energy-dense 'food and drink on the go' is widely consumed. For a multitude of reasons, healthy lifestyles may be less available to those on low incomes.¹²²

- As a general rule, people do not 'choose' to be obese. Their obesity is mainly driven by a range of factors beyond their immediate control that in practice constrain individual choice. The commercial success of the weight loss market is testament to the belief invested in the power of individuals to control their own weight. However, the concomitant rise in obesity and the frequent weight regain common those who have dieted successfully is evidence of the failure of a response built solely on this approach. Strategies based on personal motivation and individual responsibility alone do not provide an adequate response to the obesity problem.¹²³
- To be successful, a comprehensive long-term strategy to tackle obesity must act in two complementary ways to achieve and maintain a healthy population weight distribution. First, an environment that supports and facilitates healthy choices must be actively established and maintained. Second, individuals need to be encouraged to desire, seek and make different choices, recognising that they make decisions as part of families or groups that individual behaviour is 'cued' by the behaviours of others, including organisation behaviours and other wider influences.¹²⁴
- The strategy needs to be planned and co-ordinated effectively by Government and must involve multiple stakeholders. The role of non-governmental organisations – businesses, employers and voluntary organisations – is also critical and in some cases may be the dominant influence. National strategic action must be coherent, with local strategies that reflect local conditions, needs and aspirations. In particular, the role of local bodies such as local government and local health authorities must be clearly defined and linked to sufficient resources and the necessary skills to implement effective responses.¹²⁵

¹²² Butland, B. *et al.* (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science: 122.

¹²³ Butland, B. *et al.* (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science: 122

¹²⁴ Butland, B. *et al.* (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science: 122.

¹²⁵ Butland, B. *et al.* (2007) *Obesities: Future Choices – Project Report, Second Edition*, Foresight, Government Office for Science: 122.

APPENDIX 1 – INTERNATIONAL GOOD PRACTICE EXAMPLES

AUSTRALIA

Victoria

Be Active, Eat Well is a community-wide campaign in the town of Colac, Victoria Australia. The program is funded by the state government of Victoria. Colac is home to 'some of Australia's poorest families who played an active role in designing and implementing the Be Active, Eat Well campaign...Key strategies include transforming canteen menus, introducing daily fruit, reducing television watching, and increasing activities after school'.¹²⁶ In the first three years of the campaign, children in Colac had significantly lower weight and smaller waist size compared with children in a nearby control area. In addition the program improved children's health regardless of their socioeconomic status.¹²⁷ Due to its success, in 2007, a further six new community 'Go for your life' initiatives to combat obesity have been funded in Victoria focusing on children, families and older Victorians.

New South Wales

In 2007, the New South Wales Government launched '*Australia's largest ever obesity trial*' involving 4000 children up to the age of 15, randomly selected from 70 schools and childcare centres in the Hunter and New England region. Their height, weight and waist circumference measurements will be recorded for three years to assess the effectiveness of anti-obesity programs in the region.¹²⁸ The intervention components of the program include, for example, training for childcare staff regarding healthy menus, lunchboxes and physical activity; working with schools to integrate the concept of energy balance into the school curriculum; educational programs for parents of pre-school children; and working with community health services, early childhood health nurses, dieticians and GPs to offer specialist advice and support to monitor children at high risk of developing a weight problem.¹²⁹

CANADA – QUEBEC PROGRAM

In Quebec \$400 million in new funding was provided in 2006 jointly by the government and a philanthropist¹³⁰ to address childhood obesity. It is planned that the money will go to 'school boards, community groups, municipalities and other organisations that submit programs designed to improve healthy living habits, particularly among people under 25'.¹³¹ The money is in a 'special fund' to ensure it cannot be spent on other things and the 'funds also include money to fund research into obesity, stricter regulations on dietary aids and a companion awareness programme aimed at adults and sedentary office workers'.¹³²

¹²⁶ www.procor.org/community/community_show.htm?doc_id=702368

¹²⁷ Fat fighting scheme works for rich and poor, Sunday Age (Melbourne, Australia), July 27, 2008

¹²⁸ NSW Govt to launch obesity prevention trial, ABC Premium News (Australia), Feb. 17th 2007

¹²⁹ Australia's biggest obesity trial launched, http://www.health.nsw.gov.au/news/2007/20070219_01.html

¹³⁰ Andre Chagnon, provided half of the \$400 million from his charitable foundation, the Fondation Lucie et Andre Chagnon

¹³¹ Couillard kicks off anti-obesity campaign, The Gazette (Montreal), October 24, 2006

¹³² Ex-cable guy to fund Quebec's obesity fight, The Toronto Star, Oct 24, 2006

CHINA – BEIJING

'Happy 10' is a pilot intervention in Beijing schools and it was designed especially for the urban school setting by the Chinese Centre for Disease Control and it is based on the 'Take 10' model developed in the US (see US section below). 'Happy 10' incorporates 10 minutes of physical activity into third and fourth grade classrooms twice a day. It is a card game, with each card describing an activity which can be led by a teacher or a child. 'The ten-minute period is carefully calculated into one- or two- minute increments during which students pick up the card which determines what activity the class will do; engage in a timed sequence of light, moderate, and moderate-high activity; cool down while learning a health message; and reward themselves with a sticker placed on the classroom wall'.¹³³

FRANCE – EPODE (ENSEMBLE PREVENONS L'OBESITE DES ENFANTS)

The EPODE operation is a community initiative built on a pilot study with the Fleurbaix Laventie Town Health Study, which was subsequently rolled out to ten towns in ten different regions in France. The objective is to curb the progression of childhood obesity by way of a five year plan. Two levels of intervention are involved¹³⁴:

- Primary prevention which involves the entire community; and
- Secondary prevention involving the community and medical sector.

The action for schools includes educational tools for teachers, a transformed recess including more physical activity and improved school catering with themed learning spaces in schools to teach children how to cook with fruit and vegetables and provide tasting workshops.

For the entire community an annual Nutrition and Physical Exercise week will represent a focal point in the town calendar. The program contains many other community initiatives coordinated by a project leader in each town.

NEW ZEALAND

Two particular multi-component interventions are based in the family setting as follows:

- 'Food with Attitude' (FWA) and 'Young and Active' – FWA is a year long programme run by Auckland's Community Child Health and Disability Service. It involves monthly visits to the child (aged 5-12) (at school or at home) following an initial visit by a Public Health Nurse and dietician with the child and his family at home. The family sign a contract to give the child lots of encouragement and help with healthy eating and exercise. Success is measured by changes in behaviour, self-esteem and achievement of individual goals. As an add-on, Sport Auckland has been funded to work with FWA children to develop exercise activities¹³⁵.

¹³³ Happy 10 Pilot Intervention, Beijing, China,

www.procor.org/community/community_show.htm?doc_id=680570

¹³⁴ EPODE, http://www.epode.fr/pdf/communiqués/lancement_en.pdf

¹³⁵ www.arphs.govt.nz/Publications_reports/archive/child_obesity/childhood_obesity.pdf, pages 53-54

- Kids in Action (KIA)¹³⁶ is a family-based childhood obesity program, especially targeting Pacific people in the Counties Manukau District Health Board (Auckland) area. Referrals are received from schools and healthcare providers. The program involves a paediatrician, a nurse and a dietician and exercise instructors who work with the whole family. The children set goals for themselves and are awarded prizes. KIA includes:
 - Paediatric assessment;
 - Dietary advice;
 - Weekly exercise session; and
 - Family group conferences to develop strategies for the family.

NORWAY – NORDLAND

In 2004, the county of Nordland started a comprehensive school programme to provide pupils in all its 210 primary schools with at least 60 minutes of physical activity during every school day. By 2006, 144 schools had prepared activity programmes. The activity programmes were based on the schools own resources and combined physical education, outdoor education for various subjects, provision of more motivating playgrounds and walking and cycling to school.¹³⁷

SWEDEN – OSTERGOTLAND

In 2005, all primary care units in Ostergoterland took part in prescribing physical activity. 3344 patients received such prescriptions, corresponding to 1.6 per cent of all the people visiting primary care units that year. After 12 months 49 per cent of the patients had followed the prescription, while an additional 21 per cent were regularly active in a different way from that prescribed.¹³⁸

UNITED STATES

NPAO

The Nutrition, Physical Activity and Obesity Program (NPAO) is a cooperative agreement between the Centres for Disease Control (CDC) and Prevention's Division of Nutrition, Physical Activity and Obesity and 23 state health departments. The program goal is to prevent and control obesity and other chronic diseases through healthy eating and physical activity.¹³⁹ Two of the specific examples within this state program are as follows:

- Colorado Worksite Resource Kit – provides employers with resources to launch worksite wellness initiatives. The Kit outlines for employers how to plan, assess and successfully implement nutrition and physical activity interventions. The Kit is meant to complement a comprehensive approach to worksite health promotion; and
- Moses Lake, Washington State – Healthy Communities Moses Lake – encourages good nutrition and physical activity throughout the community via policy change, e.g. widening pavements and creating an interconnected

¹³⁶ www.arphs.govt.nz/Publications_reports/archive/child_obesity/childhood_obesity.pdf, page 55

¹³⁷ Physical activity and health in Europe, Evidence for Action, WHO Europe (2006), Edited by Cavill, N. et. al., page 22

¹³⁸ Physical activity and health in Europe, Evidence for Action, WHO Europe (2006), Edited by Cavill, N. et. al., page 18

¹³⁹ www.cdc.gov/nccdphp/dnpa/obesity/state_programs/about_us.htm

system of paths for pedestrians and cyclists; a community garden project; supportive environments for breastfeeding.

Take 10

The ISLI (International Life Sciences Institute) formed its Physical Activity and Nutrition (PAN) program in Atlanta in 1996. As part of PAN it developed Take 10, a classroom based physical activity program for school children. Take 10 is a curriculum tool created by teachers and it integrates academic learning (in language, arts, maths, social studies, science and health) with movement in 10-minute physical activity sessions to reduce sedentary behaviour during the school day.¹⁴⁰

CATCH

The CATCH program (Coordinated Approach to Child Health) is in over 7000 schools in the US and has been evaluated in over 80 peer reviewed publications. It brings schools, families and communities together to teach children how to be healthy for their lifetime. Healthy behaviours are reinforced through a coordinated approach in the classroom, in the cafeteria, in physical education and at home.¹⁴¹

- Classroom – Go for Health Series is the classroom health education curriculum that teaches children healthy behaviours;
- Physical Education – high energy, non-elimination activities;
- Cafeteria – Eat Smart component makes breakfast and lunch opportunities to learn, practice and adopt healthy eating;
- Home – CATCH Family component to make the home environment an extension to CATCH by getting parents and extended family involved; and
- Community – CATCH Kids Club designed for after school and summer schemes.

Boston Partnership between Schools and Business

Boston school and health officials have teamed up with local convenience stores near city middle schools to promote healthier drinks to students. To support an advertising campaign the stores have agreed to display health beverages such as pure fruit juice, water and milk prominently. The initiative will also track children's beverage purchases over the course of the pilot scheme.¹⁴²

Healthy Hawaii Initiative

The Healthy Hawaii Initiative is described as the only long-term, state-wide program to implement a social ecological approach to reduce obesity, increase physical activity, and improve nutrition. It is a collaboration between the state department of health, state department of education, and the University of Hawaii and the goal is to increase the years of healthy life for all people of Hawaii and reduce existing health disparities among ethnic groups in Hawaii in particular through nutrition and physical activity promotion. Interventions are targeted at the individual, social, and environmental level and use a variety of channels. The interventions are divided into four main delivery channels: 1) community-based interventions, 2) school-based interventions, 3) public education, and 4) professional education. Behavioural data results have shown positive trends, for example, leisure time with no physical activity

¹⁴⁰ www.take10.net

¹⁴¹ www.catchinfo.org/whatis.asp

¹⁴² www.procor.org/community/community_show.htm?doc_id=680552

in adults decreased by 7.2 per cent from 25.5 per cent in 1999 to 18.3 per cent in 2003. Over the same time period, the percentage of adults eating five or more servings of fruit/vegetables a day also increased by 5.2 per cent from 22.4 per cent to 27.6 per cent. The rate of overweight and obese adults decreased by 0.2 per cent, whereas in the rest of the U.S., the median of overweight and obese increased by 3.0 per cent.¹⁴³

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www.healthyhawaii.com/about_hhi/about_start_living_healthy/about_the_healthy_hawaii_initiative.htm

APPENDIX 2

Table 2: Criteria checklist for an effective obesity strategy¹⁴⁴

Does the strategy:	Explanation	Examples
... influence a broad set of systems levers (physiological/ psychosocial/food-related factors and the physical activity environment)?	<ul style="list-style-type: none"> A set of policies that acts across the system map needs to be devised that would include interventions in physiological, psychosocial, food-related and physical activity issues. A recognition is needed of how action in one domain can support action elsewhere; for example, environmental changes support and reinforce messages around behaviour change. 	<ul style="list-style-type: none"> Environmental changes support and reinforce messages around behaviour change. 'Walk to school' policies can be supported by action to improve work-life balance by tackling the time barrier people cite as limiting their ability to walk/cycle with their children to school.¹⁰⁰ Consideration needs to be given to the impact of drivers in the food chain for cost and consumption of food and drink.
... act at multiple levels, from the national through the local to the individual?	<ul style="list-style-type: none"> A single policy area needs to be supported at all levels of governance to provide consistent messages and to reinforce and enable healthy behaviours. 	<p>The intention to increase rates of breast-feeding:</p> <ul style="list-style-type: none"> at an individual level includes support networks to help new mothers to breast-feed at a local level means positive breast-feeding policies at local hospitals and initiatives such as Sure Start to inform and educate mothers at a national level means regulation to give women the right to breast-feed in public places or to protect employment rights and maternity leave entitlements.
... contain interventions that act at different levels with varying but cumulative degrees of impact (amplifiers, enablers, focused initiatives)?	<ul style="list-style-type: none"> Interventions that act as amplifiers, enablers, as well as focused initiatives need to be used (see Figure 8.3). 	<ul style="list-style-type: none"> Initiative: provision of healthy school meals. Enabler: efforts to improve knowledge and education about food and activity such as front-of-pack signposting. Amplifier: reduction in the perceived or real information inconsistency around health messages.
... obtain a balance between population-level measures and more targeted interventions?	<ul style="list-style-type: none"> This is best illustrated through the balance between treatment (targeted) and prevention (universal) measures. Preventative measures are focused more on the provision of a 'non-obesogenic' environment. Treatment includes focused initiatives to help those who are already obese, or considered to be at high risk of becoming obese, to lose weight and sustain that weight loss. These two approaches are complementary. 	<p>Population measures:</p> <ul style="list-style-type: none"> design of the built environment to promote walking and active transport building health into infrastructure through careful investment seeking to reduce exposure to an obesogenic diet by focusing on portion size, energy density of foods and sugar-rich drinks. <p>Targeted interventions:</p> <ul style="list-style-type: none"> focused programmes to help those who are already obese, or considered to be at high risk of becoming obese, similar to those outlined in Section 4.2.

Table 3: Criteria checklist for an effective obesity strategy (Cont...) ¹⁴⁵

Does the strategy:	Explanation	Examples
... take time into account (e.g. life-course and generational effects)?	<ul style="list-style-type: none"> Many initiatives may have limited impact beyond the lifetime of the intervention. A lifelong strategy will therefore involve two elements. First, initiatives targeted across the life course, and, second, interventions to initiate a particular change, will need to be delivered repeatedly across the life course but in slightly different formats. The generational nature of obesity means thinking about a different strategy for different generations as options change. This also means thinking about long-term goals such as how to integrate health more fully into food culture, values and habits – which could take some time. 	<ul style="list-style-type: none"> Seeking to optimise maternal nutrition (pre-pregnancy and pregnant mothers), improving the quality and quantity of breast-feeding and ensuring optimal infant growth. Developing strategies for older people where health consequences can be more immediate. Developing strategies for long-term goals such as how to integrate health more fully into food culture, values and habits. <p>Repeated delivery of interventions could include:</p> <ul style="list-style-type: none"> extending school food standards to pre-school care and to food provision for adults e.g. within the public sector such as the NHS or in other occupational settings positively facilitating activity in young people outside the school environment and after leaving school.
... have interim targets and measures, as well as a long-term obesity goal?	<ul style="list-style-type: none"> This enables clear evaluation of progress over the short term, despite the significant time lags involved in seeing changes to population BMI or associated disease levels, and means focusing on different age groups at different times. 	<ul style="list-style-type: none"> Setting a long-term vision to shift the population BMI profile and monitoring diet and activity levels over the shorter term. Reducing the short-term health costs means the focus needs to be on adults who are at risk of shortly needing medical care for diabetes or heart disease. Preventative action to reduce the risk of obesity among children will reap rewards over the medium to long term.
... actively seek alignment with other policy agendas, recognising synergies and conflicts?	<ul style="list-style-type: none"> As discussed in Section 8.1.1 (and see Figure 26), many goals of obesity policy could best be met through close integration with other policy goals, such as climate change, where there are shared objectives. 	<ul style="list-style-type: none"> Requiring health impact assessments of all policies with health recognised as an overarching goal. Working to identify commonalities and conflicts, with action on sustainability, health inequalities etc. as shown in Figure 26.
... engage a broad range of stakeholders?	<ul style="list-style-type: none"> Joint working can help deliver consistent messages and, in doing so, contribute to lower levels of ambivalence about behaviour change. 	<ul style="list-style-type: none"> Elements of the public sector, both central and local The food industry Town planning, architecture and the construction industry The sport and leisure industry The voluntary sector The media Communities Parents and children.

¹⁴⁴ Butland, B. *et al* (2007) 'Tackling Obesities: Future Choices – Project Report', 2nd edition, *Government Office for Science*: 133-135.

¹⁴⁵ Butland, B. *et al* (2007) 'Tackling Obesities: Future Choices – Project Report', 2nd edition, *Government Office for Science*: 133-135.

Table 4: Criteria checklist for an effective obesity strategy (Cont...)¹⁴⁶

Does the strategy:	Explanation	Examples
... consider the balance between cost-effectiveness and likely efficacy?		<ul style="list-style-type: none"> Building sustainability into existing programmes to provide value for money. Adopting a process of assessment of public health impact similar to that used in the ACE modelling work.⁹¹
... consider the impact on and implications for health inequalities?	<ul style="list-style-type: none"> This would mean considering the possibility of negative or unexpected consequences, for example, on low-income groups, and ensuring awareness of the increased risk of obesity in lower socioeconomic groups. 	<ul style="list-style-type: none"> Equity impact assessment of policies such as taxing the fat content of food products, which may not be successful in reducing the demand for highly desired food but may serve to reduce the income available for other healthier foods.
Is the strategy supported by:	Explanation	Examples
... an ongoing strategy development process underpinned by expert analysis, data-gathering processes and a robust evaluation framework?	<ul style="list-style-type: none"> A continuous improvement model is required to ensure new data is considered and used to refine strategy. 	<ul style="list-style-type: none"> Establishing an independent strategic-level expert group to advise Government on obesity. Enhancing population surveillance activities and data gathering on obesity. Building robust evaluation into existing activities, building on existing work.
... suitable government management structures to enable clear leadership, strategy formulation and co-ordination of action across Government (UK, devolved administrations, regions and localities) and with other key stakeholders?	<ul style="list-style-type: none"> It is critical that any structure raises the profile of improving population health and enables government departments to work effectively together and to engage with other key partners on both strategy development and delivery. 	<ul style="list-style-type: none"> There are a number of alternative models. These could range from a government department focused on public health, or the establishment of a special agency or commission through to the appointment of a champion or figurehead for obesity.
... underpinning risk analysis (for management of unexpected consequences)?	<ul style="list-style-type: none"> Expert input is vital for risk management as well as risk assessment. It needs to be supported by robust surveillance and evaluation activities to track a wide range of outcomes of interventions and to spot unexpected consequences. 	<ul style="list-style-type: none"> Undertaking detailed monitoring of the impact on activity levels of new transport policies (for example, when a subsidised yellow school bus scheme was piloted in Bristol, a third of the pupils using the service stopped walking or cycling in order to take the bus, and another third merely transferred from other bus services; as a result, the full service was not introduced).¹⁰¹
... sufficient resources to enable a scaled-up response?	<ul style="list-style-type: none"> It is critical that a raised priority for obesity is supported by appropriate levels of resources. 	<ul style="list-style-type: none"> This could include considering levels of staffing and training needs, as well as financial support.

¹⁴⁶ Butland, B. *et al* (2007) 'Tackling Obesities: Future Choices – Project Report', 2nd edition, *Government Office for Science*: 133-135.