Appendix 1 – Global obesity facts & figures

Key Message	Important Facts
Obesity is a growing global health problem around the world	• Since 1980 obesity prevalence has more than doubled worldwide • Obesity is now recognized as one of the most important public health problems facing the world today (1). • In 2008, around 1 in 4 adults were overweight (1.5 billion adults). - Of these over 200 million men and nearly 300 million women were obese (2). • Figures suggest that in 2010 more than 3.37 million deaths occurred worldwide due to high BMI, an increase from 1.96 million in 1990 (3). - The combined total of deaths from high BMI and physical inactivity was 6.56 million in 2010, more than that from tobacco (3). • 65% of the world's population live in countries where overweight causes more deaths than being underweight (3).
Childhood obesity is increasing and is associated with an increase in disease risk factors	• Childhood obesity is becoming increasingly common, especially in westernized countries. • Over 200 million school-age children and more than 40 million children under the age of five were overweight in 2010 (2). • This generation of children is the first predicted to have a shorter lifespan than their parents (4). • Obese children have been found to have increased risk of type 2 diabetes, hypertension, raised blood cholesterol, metabolic syndrome and fatty liver disease (5,6). • Obesity in childhood and adolescence continues into adulthood; it has been predicted 77% obese children are obese adults (7). • Becoming obese earlier in life also amplifies certain health risks later in life, particularly for type 2 diabetes.
Obesity is a major cause of morbidity, disability and premature death	• Obesity increases the risk for a wide range of chronic diseases • BMI is thought to account for - 60% of the risk of developing type 2 diabetes; - 20% of hypertension and coronary-heart disease; - 10 to 30% of various cancers. • Other co-morbidities include raised cholesterol, gall-bladder disease, fatty liver disease, sleep apnoea, heartburn, osteoarthritis and depression. • The global disease burden attributable to obesity has been calculated at over 93 million disability-adjusted life years (DALYs), almost doubling since 1990 (51.5 million) (8). - due primarily to ischaemic heart disease and type 2 diabetes. • Middle-aged women suffer more ill-health from obesity than from any other cause (3).
Many low- and middle-income countries are now facing a "double burden" of disease.	There is increasing evidence that when economic conditions improve, obesity and diet-related non-communicable diseases may escalate in countries with high levels of under-nutrition (9). • There is evidence to indicate that under-nutrition in utero and early childhood may predispose individuals to greater susceptibility to some chronic diseases. • Many low and middle income countries continue to face problems of infectious disease and under-nutrition and are now experiencing a rapid increase in non-communicable disease risk factors such as obesity and overweight. • It is not uncommon to find under-nutrition and obesity existing side-by-side within the same country, community, household or even individual. • Populations are increasingly exposed to high-fat, high-sugar, high-salt, energy-dense, micronutrient-poor foods, resulting in sharp increases in childhood obesity

	while under-nutrition issues remain unsolved. • Research has suggested that early life nutritional stunting, which is usually caused by chronic under nutrition, is positively associated with raised body fatness later in life (10).
Obesity has substantial direct and indirect costs that put a strain on healthcare and social resources.	• Obesity presents a significant cost burden to individuals, health services and the economy, both directly and indirectly. • It has been estimated that the average obese person spent 36% more on medical care than normal weight people (11). • Direct medical costs include the preventative, diagnostic and treatment services related to overweight and associated co-morbidities. • Indirect costs are often much higher and include income lost from decreased productivity, reduced opportunities and restricted activity, illness, absenteeism and premature death. • The cost of obesity is rising in OECD countries – The proportion of total healthcare spend rose from 5% in 1970 to 9% in 2003; the highest figure is in USA at 16% (12). • In the USA, the annual combined direct and indirect cost is 126 billion euros in 2000, a rise from 72billion in 1995 (13). • In the UK, the healthcare costs attributable to overweight and obesity are projected to double to £10 billion per year by 2050. The wider costs to society and business are estimated to reach £49.9 billion per year (at today's prices) (14). • High costs are also associated with infrastructure changes required to cope with the rising obesity, such as reinforced beds, operating tables and wheelchairs; enlarged turnstiles and seats in sports-grounds and modifications to transport safety standards.
Maternal obesity during pregnancy poses risks for both foetus and mother pre- and post-pregnancy	• Global figures suggest there are more than 100 million obese women of child bearing age, with a further 250million who are overweight (2). • Obese women are 3 times more likely to present with infertility compared with women of normal BMI, with the infertility rate increasing by 4% per BMI unit in obese women(15). • Obesity in pregnancy is associated with an increased risk of a number of adverse outcomes including miscarriage, gestational diabetes(16), hypertension, pre-eclampsia (17), high risk labour (18), haemorrhage (16) and maternal death. • Maternal obesity can increase the risk of foetal distress, still birth (19) and a 'large for gestational age' birth which can increase the likelihood of labour and birth complications • High gestational weight gain can increase BMI of an infant later in life. • In an obese mother, high levels of inflammatory cytokines, insulin resistance, glucose levels and hyperlipidaemia (20) can be seen which can result in the foetus having a higher insulin resistance and higher percentage body fat (21).
At an individual level some links between genes and obesity can be seen but are not sufficient explanations for the rapidly rising rates of obesity	• There is a direct link between genes and obesity in conditions such as Bardet-Biedl syndrome and Prader-Willi syndrome. • According to the 'thrifty gene hypothesis', the same genes that helped our ancestors survive are the same genes that are causing obesity. • Many obesity genes are only expressed in the presence of obesity-promoting behaviours such as sedentary behaviour and/or high energy intake. • Whilst genes are an important determinant of obesity in some individuals, they are not a sufficient explanation of the rapid rise in obesity over the past couple of decades.
Poor nutrition, in particular an increase in energy dense processed food which is high in fat, sugar and salt, is contributing to obesity globally	• Eleven out of 20 of the leading causes of disease in the world can be attributable, at least in part, to poor nutrition. These are high blood pressure, low fruit, high BMI, childhood under-nutrition, high sodium, low nuts and seeds, iron deficiency, high total cholesterol, low whole grains, low vegetables and low omega-3 (3). A major driver of obesity is excess energy consumption in relation to energy expenditure. • FAO figures indicate that total energy availability per person per day has increased by 450kcal/day in developed and more than 600kcal in developing countries (between the mid 60's and early 90's) (22). • There has been a dietary shift away from fresh, minimally processed, grain based foods towards ultra-processed foods (23). - These are often high in fat, salt and sugars but low in vitamins, minerals and other micronutrients.

	• In the USA the proportion of food eaten away from home has increased by approximately 40% (24) and by 25-30% in Australia and UK (25, 26).
Changing cultures, an increase in technology and an increasing reliance on motor vehicles is resulting in more sedentary lifestyles which, without compensatory reduction in energy intake, increases the risk of obesity	• Adult energy expenditure was predicted to have fallen by up to 800kcal between 1970 and 1990 (27), and although in part compensated for by a suppression of intake, still leaves a positive energy balance which gradually results in weight gain. • There is evidence for a close association between obesity and hours spent watching TV and the number of cars per household (28). • Changes to mode of travel have occurred – In the USA, use of own vehicles increased from 7% to 88% between 1970 and 2000 while walking as sole mode decreased from 7.4 to 2.9% and use of public transportation decreased from, 8.9%-4.7% in the same period (29). • There has also been a decline in active work (30) as machinery and technology replace human labour.
The food industry has an important role to play in reducing obesity	The World Organization says that the food industry can play a significant role in promoting healthy diets (31) • Reducing the fat, sugar and salt content of processed foods; • Portion control; • Nutrition labelling (front and back) • Ensuring that healthy and nutritious choices are available and affordable to all consumers; • Practicing responsible marketing, particularly to children; • Supporting regular physical activity practice in the workplace.
There is increasing support for restrictions of food marketing to children	• Advertising restrictions are increasingly recognised as an important way in which to reduce exposure to unhealthy food marketing • In early 2012 the World Health Organization issued a set of guidelines to assist member states in the development of national marketing controls(33) • There have been a range of responses globally, including some voluntary, some industry-led and some mandatory guidelines - Industry-led schemes include USA CFBAI guidelines and EU pledge - Mandatory include UK OfCom - Voluntary - Danish Forum Code • A 2011 monitoring report from the EU indicated an overall decline in marketing impacts of 29% between 2005 and 2011 (3.6bn to 2.5bn impacts) across seven EU countries, however some countries had significant increases, including Slovenia (up 26%) and the Netherlands (up 38%) (34). • There are a number of issues that need to be addressed, in particular the effectiveness of voluntary vs. mandatory schemes, the age definition of a child, the media forms covered by schemes and the use of branding.
Support at a societal level is vital for individual change	At the individual level, people can: • limit energy intake from total fats; • increase consumption of fruit and vegetables, as well as legumes, whole grains and nuts; • limit intake of sugars; • engage in regular physical activity; Individual responsibility can only have its full effect where people have access to a healthy lifestyle. Therefore, at the societal level it is important to: • Ensure that the healthier options are the default and easiest options; • Support individuals, through sustained political commitment and the collaboration of many public and private stakeholders; • Make regular physical activity and healthier dietary patterns affordable and easily accessible to all - especially the poorest individuals; • Create environments which promote healthier lives, active travel and reduced car usage
Health practitioners need to be able to identify obesity and make appropriate recommendations for	• Body mass index (weight (kg)/height(m^2)) is the standard method used for determining overweight and obesity – a BMI ≥25kg/m^2 is overweight, ≥30 is obese kg/m^2, ≥35 severely obese kg/m^2 and ≥40 morbidly obese kg/m^2. • When losing weight, aim to lose between 500g and 1kg per week. • Weight loss of 10%+ can bring about improvements in co-morbidities.

weight loss	• Very low calorie diets (VLCD) (less than 800kcal/day) can achieve rapid weight loss, but sustained weight loss and maintenance is low.
Behaviour change is an important method of weight loss and should always be tried in the first instance	Behaviour change involves both increasing physical activity and changing diet. • It is important to set realistic and specific goals; • Diet diaries, exercise logs and pedometers can all be used to help maintain motivation; • Commercial weight loss programmes can help by offering supportive networks to keep people motivated. Individuals should discuss with their GP what is most appropriate for them;
Pharmacological treatment can be used to 'kick-start' weight loss when coupled with behaviour change	• Drugs to promote weight loss are typically targeted in one of three ways (42) - reduce hunger/food intake, stimulate energy expenditure or inhibit absorption of dietary fats. • Such drugs are advised as part of lifestyle change in patients with a BMI >30 (or >27kgm2 if co-morbidities are also present). • The main drug used today is Orlistat (reduces fat absorption) which- found to achieve 10% weight loss after a year in a third of cases (43). - Often all weight is put back on when the drug is withdrawn.
Bariatric surgery is the most cost effective treatment for severe-morbid obesity	• Bariatric surgery is considered the most cost-effective treatment for morbid obesity (35), leading to loss of excess weight by 45-70% (36). • Bariatric surgery can significantly reduce type 2 diabetes, with more than 75% of cases being resolved completely (37), eliminate sleep apnoea in 60-70% of subjects as well as reducing other risk factors such as hypertension and lipidaemia (38,39). • In 2008, 344221 bariatric surgery operations were performed, 220000 of which were in USA (based on a survey of international federations for the surgery of obesity and metabolic disorders) (40). • The most common procedures are laparoscopic gastric banding (42.3%) and laparascopic gastric bypass (39.7%). Almost all procedures increased in frequency the period 2003-2008 (40). • Gastric bypass surgery can be performed in adolescents, resulting in significant weight reduction (between 28 and 45% 1–6 years after surgery) (41).
The WHO has set a global target to *"Halt the rise in obesity by 2025"*	The WHO NCD Global Action Framework has set a target on obesity, to halt the rise in obesity by 2025 (31) Indicators of progress will include: • Age-standardized prevalence of overweight and obesity in adults aged 18+ years (defined as body mass index greater than 25 kg/m2 for overweight or 30 kg/m2 for obesity); • Age-standardized prevalence of overweight and obesity in adolescents (defined according to the WHO Growth Reference, overweight-one standard deviation BMI for age and sex and obese-two standard deviations BMI for age and sex); Related progress indicators include: • Adoption of national policies that limit saturated fatty acids and virtually eliminate partially hydrogenated vegetable oils in the food supply as appropriate within the national context and national programmes; • Policies to reduce the impact on children of marketing on foods and non-alcoholic beverages high in saturated fats, trans fatty acids, free sugars, or salt;

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