



# OBESITY IN SCOTLAND PREVALENCE AND EVIDENCE BASE

## Key Facts

- » Obesity is defined as a Body Mass Index (BMI) over 30 kg/m<sup>2</sup>, which records weight adjusted for height
- » Obesity shortens life, increasing early deaths from type 2 diabetes, heart disease, common cancers and dementia
- » Obesity also harms many other aspects of health, such as sexual function, breathing, mood and social interactions
- » Obesity is a serious public health threat in Scotland: Two in every three adults in Scotland (65%) are have obesity or are overweight; people of normal weight in Scotland are now in the minority
- » Almost one third of Scottish children have obesity or are overweight, even more in deprived communities
- » Obesity rates in Scotland are amongst the highest in the world
- » People living in the most deprived areas of Scotland, particularly children, are more likely to have obesity than those living in the more affluent areas
- » The current obesity crisis results from living in unhealthy social environments. In these “obesogenic” environments, overconsumption of energy dense ‘junk’ foods is too available, more affordable and accepted
- » Although personal choices are important obesogenic environments are the most powerful driver of high obesity levels in Scotland
- » Obesity reduces productivity and physical activity in Scotland; it increases sickness absence, and demand for health and social care services
- » The cost of obesity to the NHS in Scotland is huge, estimated at around £600 million annually. Wider economic costs are even bigger, up to £4.6 billion annually
- » Addressing obesity is part of one of the key public health priorities of the Scottish Government: “A Scotland where we eat well, have a healthy weight and are physically active” (Priority 6)



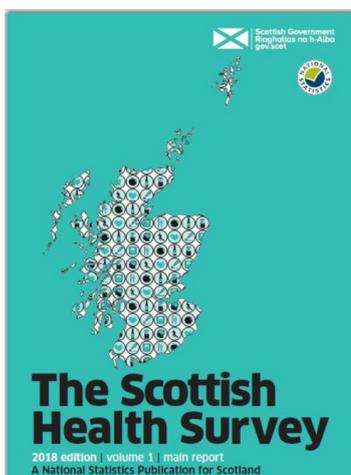
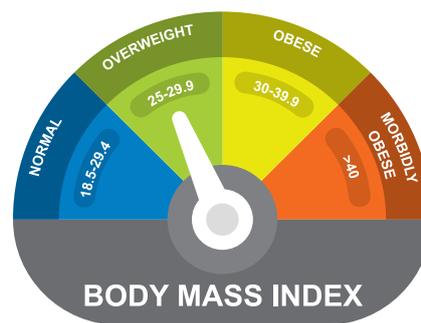
**Obesity Action  
Scotland**

Healthy weight for all

## DEFINITION OF OBESITY

On a population level, overweight and obesity are usually defined using Body Mass Index (BMI). BMI is a measure of whether a person is a healthy weight for their height. For adults overweight is defined as having a BMI of 25 – 29.9 kg/m<sup>2</sup>, and obesity is defined as having a BMI of over 30kg/m<sup>2</sup>.<sup>1</sup>

BMI, calculated from a person's height and weight, is the most effective population measure available as it is relatively accurate, simple and cheap for large population groups. However, there will always be a few exceptions to the rule. For example, people who are very muscular and pregnant women will be quite heavy for their height with a high BMI, but will not have the health risks of carrying extra fat mass. In such individual circumstances other measures can be used to provide a more accurate assessment of healthy weight.



## MONITORING OF OBESITY

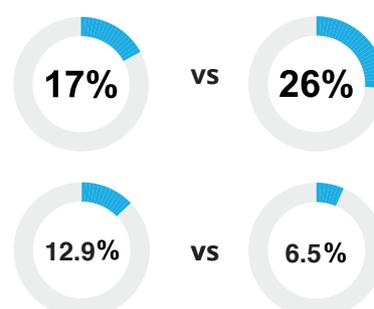
Carried out annually, the Scottish Health Survey<sup>2</sup> provides a detailed picture of the health of the Scottish population. Each year the survey provides BMI data for adults and children.

Routine Child Health Reviews<sup>3</sup> which includes height and weight are undertaken in Primary 1 (age 4 to 6) covering 92% of that population group. The resulting statistics report BMI annually.

In England the National Child Measurement Programme<sup>4</sup> measures height and weight at reception (age 4 to 6) and year 6 (age 10 to 11).

## CHILDHOOD OBESITY IN SCOTLAND

- » In 2018, 29% (or around 236,000) of children aged 2 to 15 in Scotland were at risk of overweight or obesity; of which 16% (or around 130,000) were at risk of obesity<sup>2</sup>
- » In 2017/18, 22% of primary<sup>1</sup> children (aged 4 to 6) were at risk of overweight or obesity; of which 10% were at risk of obesity and 12% were at risk of overweight; these high rates have persisted relatively unchanged over the last decade<sup>3</sup>
- » The proportion of healthy weight Primary 1 children has remained the same in the last 10 years (in 2007/8 and 2017/18 it was 77%)<sup>3</sup>; however, the percentage of children at risk of overweight and obesity has increased in the most deprived areas and decreased in the least deprived
- » In 2017/18 in the least deprived areas, 17% of Primary 1 children were classified as at risk of overweight and obesity, compared to 26% in the most deprived areas<sup>3</sup>; the proportion of children at risk of obesity in the most deprived areas is now double that of the least deprived (12.9% vs 6.5%)
- » This trend is also now clearly evident in the English National Child Measurement Programme<sup>4</sup>



# ADULT OVERWEIGHT AND OBESITY IN SCOTLAND

» Two in three (65%) adults aged 16-75+ are overweight or have obesity (BMI over 25).<sup>2</sup> As the adult population of Scotland in 2018 was 4,513,6235, this means that over 2.9 million adults in Scotland were too heavy. This is worryingly high

» More than one in 4 adults have clinical obesity (28%, or almost 1.3 million)<sup>2</sup>

» Between 2003 and 2018, the proportion of adults categorised as having obesity, increased even further, from 24% to 28%<sup>2</sup>, and overweight / obesity increased from 62% to 65%<sup>2</sup>

» In 2017, of those whose health risk from BMI was categorised as 'high risk' or above, 57% were women and 42% men<sup>6</sup>

» Waist circumference increased significantly for both men and women between 2003 and 2016/17 in Scotland. For women the increase was higher from 39% to 54%, whereas for men the increase was from 28% to 38% during this time<sup>6</sup>

» Based on both BMI and waist circumference, 69% of women and 58% of men in Scotland were overweight or had obesity in 2016/17<sup>6</sup>

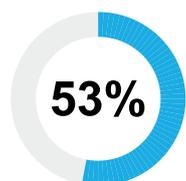
» Obesity increases with age, rising from 14% in the 16-24 age group, to 36% in those aged 65-74<sup>2</sup>



» Obesity does not affect everyone equally. Obesity rates are some two-fold higher in areas of greater deprivation, particularly among women, children, older age groups, black and minority ethnic groups, and people with disabilities<sup>7</sup>

» In the most deprived areas in Scotland, the disparity in obesity rates is particularly evident for women at 35%, compared to 20% in the least deprived areas<sup>8</sup>

## OBESITY IN PREGNANT WOMEN



» The 2019 report on births in Scottish hospitals indicated that almost 53% of pregnant women in 2018 were overweight or had obesity<sup>9</sup>

» The latest European Perinatal Health Report,<sup>10</sup> which presented BMI data of only 12 of 31 European countries, showed that the lowest levels of overweight or obesity in pregnant women were in Croatia (26.8%), Austria (29.0%) and Slovenia (29.2%). The majority of other European countries had rates of 32–39%.

» The risk of complications in pregnancy increases with overweight and obesity, including high blood pressure, gestational diabetes and risk of preterm birth, so a higher level of care and monitoring is required<sup>11</sup>

» Children whose mothers are overweight or have obesity are significantly more likely to have overweight or obesity themselves<sup>12</sup>

## SCOTLAND VS THE WORLD

» Obesity rates in Scotland are higher than the overall UK rates: 65% vs 63% are overweight or have obesity, and 28% vs 27% have obesity<sup>13</sup>

» Across the world, 39% of adults are classified as being overweight and 13% as having obesity,<sup>1</sup> compared to 65% and 28% in Scotland, respectively

» Obesity rates in Scotland are among the highest in the developed world<sup>14</sup>, with projections suggesting that by 2030 rates could exceed 40%<sup>15</sup>

» If worldwide obesity trends continue, the probability of meeting the World Health Organisation's global obesity target which aims for no rise in obesity above 2010 levels by 2025 will be close to zero<sup>16</sup>





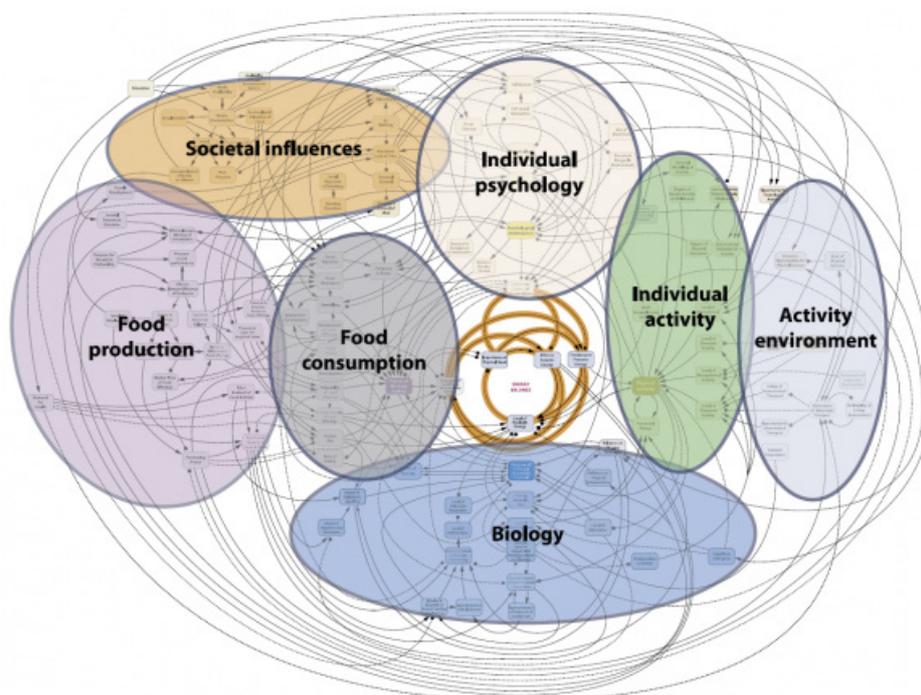
# CAUSES OF OBESITY

Obesity, understood as the accumulation of excess body fat, occurs when energy intake from food and drink is greater than the body's energy requirements over a prolonged period. An obesogenic environment is one that promotes weight gain, acts on individual physiology and psychology, influencing individual lifestyles. Although personal choice plays a role in weight gain, in obesogenic environments inactivity and overconsumption of energy dense foods are easy, affordable and widely accepted, making unhealthy lifestyle the default option.

## The Foresight report<sup>17</sup> for the UK government identified 7 clusters of factors/behaviours that are contributing to obesity (termed a 'system's map')

- 1 food consumption** – characteristics of the foodmarket in which consumers operate e.g. the level of food abundance and variety, the nutritional quality of food and drink, the energy density of food, and portion size
- 2 food production** – drivers of the food industry e.g. the pressure for profitability, the price of food, effort to increase efficiency of production; variables reflecting the wider social and economic situation in the UK e.g. purchasing power and societal pressure to consume
- 3 individual psychology** – psychological attributes e.g. self-esteem, stress, 'demand for indulgence', level of food 'literacy'; variables related to the level of parental control and level of children's control of diet
- 4 societal influences** – factors that have influence at the societal level e.g. education, media availability and consumption, TV watching; variables related to social norms around weight and body image
- 5 physiology** – biological variables e.g. genetic predisposition to obesity, level of satiety and resting metabolic rate
- 6 individual activity** – individual's or group's level of recreational, domestic, occupational and transport activity, parental modelling of activity and learned activity patterns
- 7 physical activity environment** – factors that may facilitate or obstruct physical activity e.g. cost of physical exercise, perceived danger in the environment and the 'walkability' of the living environment; variables that reflect cultural values associated with activity patterns

These clusters are interconnected. For example, some individuals may exhibit compensatory behaviour such as allowing themselves an energy-dense snack as a 'reward' after exercising. This connectivity is important when designing/delivering interventions, as it may help to explain unexpected impacts or losses of impact due to mitigating effects of different factors/behaviours.



# IMPACT OF OBESITY

Obesity increases the risk of

Obesity can have a negative impact on health as well as other aspects of life for adults and children reducing their overall quality of life.



**TYPE 2 DIABETES** Type 2 diabetes: Fat cells in the body, especially from fat tissue around waist, produce hormones and proteins that interfere with body's cardiovascular and metabolic systems, increasing risk of type 2 diabetes. Women with obesity are 13 times more likely to develop type 2 diabetes than those of a healthy weight.<sup>18</sup> Overweight and obesity is the main modifiable risk factor of type 2 diabetes; 90% of adults with type 2 diabetes have overweight or obesity<sup>19</sup>



**13 COMMON CANCERS** breast, womb (endometrial), bowel, pancreas, oesophageal, kidney, ovarian, prostate, gallbladder, liver, stomach, myeloma and meningioma. Hormones and proteins produced by fat cells are released into the bloodstream and carried around the body to many organs increasing the cancer risk. In the UK, obesity is the second biggest preventable cause of cancer after tobacco; 22,800 cancers could be prevented each year by maintaining a healthy weight<sup>20</sup>



**CARDIOVASCULAR DISEASE** hypertension, atherosclerosis, heart failure, ischaemic heart disease, ischaemic stroke. Obesity increases the risk of cardiovascular disease through causing high blood pressure and type 2 diabetes. 36% of hypertension, 18% myocardial infarction, 15% angina pectoris, and 6% of strokes are attributable to obesity<sup>21</sup>



**ALZHEIMER'S DISEASE**<sup>22</sup> and dementia



**GASTROINTESTINAL DISORDERS** gallstones, pancreatitis, liver disease, gastro-oesophageal reflux disease, irritable bowel syndrome. Gastrointestinal disorders are 2 to 3 times more common in individuals who have obesity than in people of normal weight.<sup>23</sup> 15% of gall stone cases are attributable to obesity



**INFERTILITY** in women and impotency in men.<sup>24</sup> Losing weight improves women's chance of getting pregnant and in men improves hormone balance and erectile dysfunction<sup>25</sup>



**COMPLICATIONS DURING PREGNANCY AND BIRTH** miscarriage, gestational diabetes, high blood pressure and pre-eclampsia, blood clots, baby's shoulder becoming "stuck" during labour, heavier than normal bleeding after birth<sup>11</sup>



**MUSCULOSKELETAL PROBLEMS** gout, osteoarthritis, and lower back pain are caused by the mechanical and/or metabolic strain of excess fat mass on the bones<sup>24,5</sup>



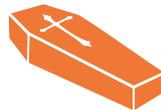
**MENTAL HEALTH PROBLEMS** depression, bipolar disorder and anxiety are associated with obesity.<sup>26</sup> Mechanisms are still being investigated and could include higher inflammation levels, insulin resistance, hormonal changes and social and cultural factors<sup>27</sup>



**RESPIRATORY DISORDERS** asthma, chronic obstructive pulmonary disease, obstructive sleep apnoea are caused by mechanical factors and metabolic pathways related to obesity<sup>24</sup>



**KIDNEY DISEASE**<sup>28</sup>



**PREMATURE DEATH** obesity reduces life expectancy by 3.5-4.2 years in adults aged 40 and over; severe obesity (BMI > 40) reduces it by 8-10 years<sup>29</sup>



**UNEMPLOYMENT**<sup>7</sup>



**DISCRIMINATION AND STIGMATISATION**<sup>7</sup>



**INCREASED RISK OF HOSPITALISATION** People with severe obesity (BMI > 40) have been found to be 3 times more likely than those of healthy weight to need social care

# ADDITIONAL RISKS FOR CHILDREN WITH OBESITY



» Emotional and behavioural impacts: stigmatisation, bullying, low self-esteem, and school absence<sup>7</sup>

» Breathing difficulties, increased risk of fractures, hypertension, early markers of cardiovascular disease, insulin resistance and psychological effects<sup>1</sup>

» Risk of having obesity in adulthood<sup>7</sup>

» Higher risk of morbidity, disability and premature mortality in adulthood<sup>24</sup>

## COST OF OBESITY IN SCOTLAND

The annual cost to the NHS in Scotland of obesity is estimated to be £600 million.<sup>30</sup> Average NHS costs for people with a body mass index of 40 (severe obesity) are estimated to be twice those for people with a BMI of 20 (within normal weight range). Wider economic costs are even bigger, between £0.9 billion and £4.6 billion annually.<sup>31</sup>

Healthcare expenditure is only part of the issue; there are also indirect economic costs of overweight and obesity. The McKinsey Institute estimates that the cost to the UK is equivalent to 3% of gross domestic product (\$70billion).<sup>32</sup> This analysis takes into account: loss of productivity attributable to loss of life or impaired life quality, direct health care costs, and investment to

[obesityactionscotland.org](http://obesityactionscotland.org)

## REFERENCES

- World Health Organization (2018) Obesity and overweight. <https://www.who.int/dietphysicalactivity/childhood/en/>
- Cheong C, Dean L, Dougall I, et al (2019) The Scottish Health Survey. 2018 Edition. Volume 1. Main Report. Edinburgh
- Information Services Division (2018) Body Mass Index of Primary 1 Children in Scotland. Technical Report. School Year 2016/17
- Health & Social Care Information Centre (2018) National Child Measurement Programme, England - 2017/18. London
- National Records of Scotland (2018) Scotland's Population 2018 - The Registrar General's Annual Review of Demographic Trends
- Bardsley D, Dean L, Dougall I, et al (2018) The Scottish health survey. 2017 Edition. Volume 1. Main report
- Public Health England (2015) Making the case for tackling obesity. Why invest? 2016
- McLean J, Christie S, Gray L, et al (2017) The Scottish Health Survey. 2016 edition. Volume 1. Main report. A National Statistics Publication for Scotland.
- National Health Service (2019) Births in Scottish Hospitals - Year ending 31 March 2019
- Euro-Peristat Project (2018) European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015
- NHS Choices (2015) Risk of being overweight in pregnancy. 2016
- Bradshaw P, Hinchliffe S (2018) Growing up In Scotland: Overweight and obesity at age 10
- OECD (2017) Health at a Glance in 2017: OECD Indicators. How does the United Kingdom compare?
- OECD (2014) Obesity Update 2014
- 02/10 RRDB (2010) Preventing Overweight and Obesity in Scotland. A Route Map Towards Healthy Weight.
- (NCD-RisC) NCDRFC (2016) Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. *Lancet* 387:1377-1396
- Butland B, Jebb S, Kopelman P, et al (2007) Foresight. Tackling Obesity: Future Choices - Project Report. 2nd Edition.
- NHS Information Centre Lifestyle Statistics (2012) Statistics on obesity, physical activity and diet, England 2012
- Gatineau M, Hancock C, Holman N, et al (2014) Adult obesity and type 2 diabetes. London
- Cancer Research UK (2018) Does obesity cause cancer? <https://www.cancerresearchuk.org/about-cancer/causes-of-cancer/obesity-weight-and-cancer/does-obesity-cause-cancer>. Accessed 11 Mar 2019
- McGuire A, Morris S, Raikou M (2001) Appendix 6 Estimating the cost of obesity in England in The National Audit Office Tackling obesity in England
- Christensen A, Pike CJ (2015) Menopause, obesity and inflammation: interactive risk factors for Alzheimer's disease. *Front Aging Neurosci* 7:130. <https://doi.org/10.3389/fnagi.2015.00130>
- American College of Gastroenterology (2016) Obesity. 2016
- Public Health England (2016) Health risks of adult obesity
- Pasquali R, Patton L, Gambineri A (2007) Obesity and infertility. *Curr Opin Endocrinol Diabetes Obes* 14:482-487
- Simon GE, Korff M, Von, Saunders K, et al (2016) Obesity and psychiatric disorders in the US adult population. *Arch Gen Psychiatry* 63:824-830
- Harvard TH Chan School of Public Health (2018) Weight problems take a hefty toll on body and mind. <https://www.hsph.harvard.edu/obesity-prevention-source/obesity-consequences/health-effects/>. Accessed 27 Sep 2019
- Kopple JD (2010) Obesity and chronic kidney disease. *J Ren Nutr* 20:S2930
- Bhaskaran K, Dos-Santos-Silva I, Leon D, et al (2018) Association of BMI with overall and cause-specific mortality: a population-based cohort study of 3.6million adults in the UK. *Lancet* 6:944-953
- Grant K (2017) SPICe briefing: How can we reduce obesity in Scotland? Edinburgh
- Castle A (2015) SPICe Briefing: Obesity in Scotland
- Dobbs R, Sawers C, Thompson F et al (2014) Overcoming obesity. An initial economic analysis. Discussion paper. McKinsey Global Institute