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Public Health Wales

The case for action on obesity in Wales

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1 Introduction

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Introduction

Obesity prevalence is rising in Wales, as it is globally.

It is estimated that illnesses associated with obesity cost the Welsh NHS more than £73m a year.[1]

The Public Health (Wales) Act 2017 places a duty on the government to develop a strategy focused on preventing and reducing obesity levels.[2] The vision for Wales in which being a healthy weight is the norm, will improve the quality of life for individuals, their children and communities, improve productivity, educational attainment and mental wellbeing and will not just reduce the burden on the NHS.

This case for change sets out the scale of overweight/obesity in Wales. It uses routinely collected and survey data. In this report, adults are defined as aged 16+ years.

At its most simple level, obesity is a result of an energy imbalance; this occurs when the energy consumed from food is much greater than the energy expended. Overweight and obesity are terms that refer to an excess of body fat and resulting in weight gain.

1.1 Measurement of obesity

The most widely used measure of obesity is the body mass index (BMI) – weight in kilograms divided by height in metres squared. BMI provides a good indicator for levels of body fat.

Other less commonly used are measures of central obesity such as the waist to hip ratio, waist circumference and abdominal fat.

The BMI of adults remains relatively constant unless they gain or lose a lot of weight. BMI measurement provides the most useful population-level measure of overweight and obesity as it is the same for both sexes and for all adult ages worldwide. BMI categories are: **underweight** <18.5; healthy **weight** 18.5 to <25; **overweight** 25 to <30; **obese** 30 to <40; **morbidly obese** 40+. While BMI does not distinguish between mass due to body fat and muscle mass, nor does it take account of the distribution of fat it remains the most reliable measure for the majority of the population. It is also recognised that ethnicity may affect BMI.[3]

Assessing the BMI of children is more complicated than of adults because a child's BMI changes as he/she grows and develops. Growth patterns also vary between genders. BMI in children is classified using thresholds that vary to take into account the child's age and sex.

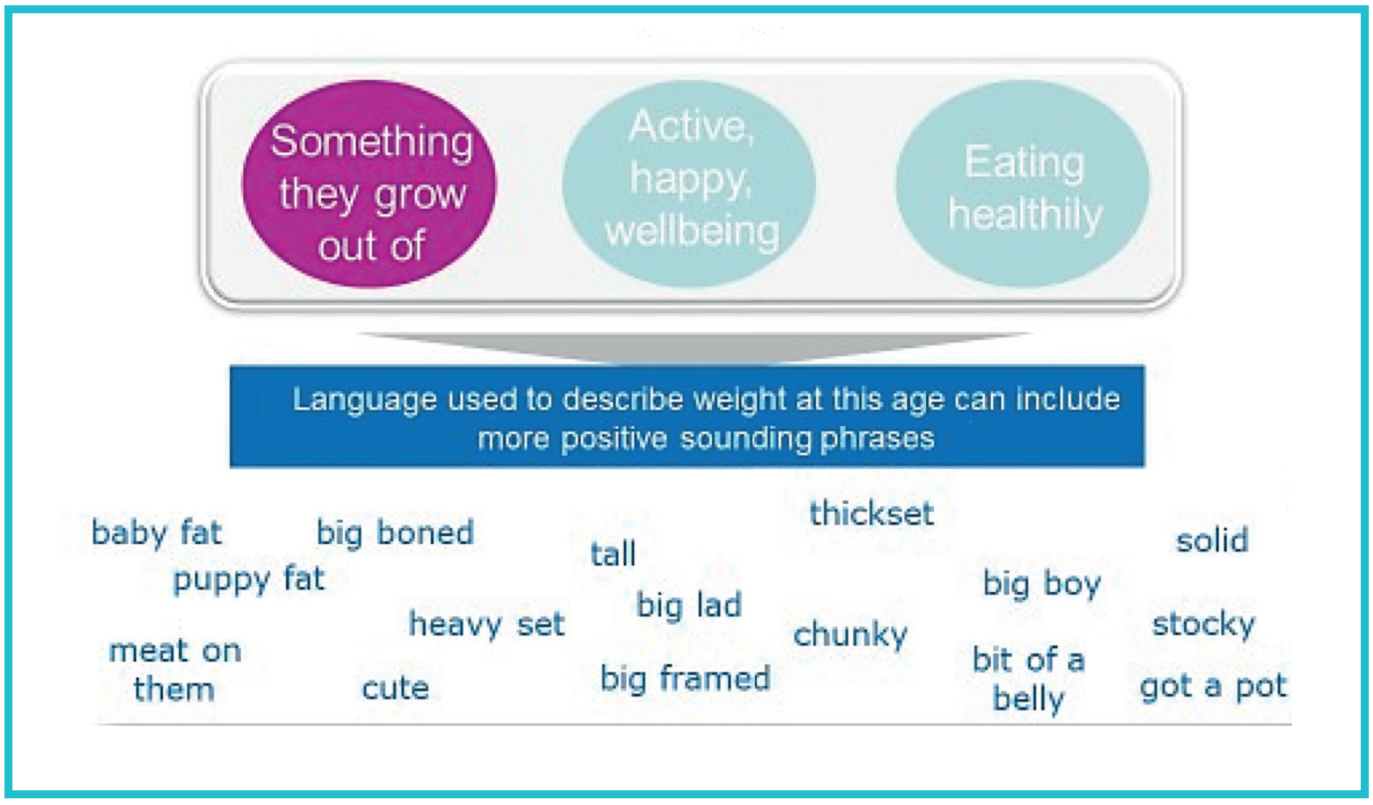
Obesity in children is defined as 'a BMI at or above the 95th percentile for children and adolescents of the same age and sex (as according to the British 1990 growth reference scale (UK90))'; BMIs between the 85 and 94 percentile on age-growth charts are considered overweight.[4]

BMI thresholds are frequently defined in terms of a specific z score, or centile, on a child growth reference. Once a child's BMI centile or z score has been calculated (BMIz), this figure is checked to see whether it is above or below the defined thresholds for the child growth reference used.

1.2 Perceptions of adult and childhood obesity

The scale of the obesity problem is underestimated and often under-acknowledged.[5] An individual's perception of their weight does not tally with findings from routine data and other sources. There is significant stigma about being classified as being obese. Individuals do not often recognise the problem.[6] This may be due to the societal normalisation of obesity.[7] The Health Survey for England, 2016, found that most obese adults (87%) considered themselves to be heavy, while only half (50%) of overweight adults considered themselves to have fallen into the overweight category.[8]

FIGURE 1: Perceptions of a healthy weight in children, Wales, 2016



Source: Public Health Wales NHS Trust. 10 Steps to a Healthy Weight survey report, 2016.

In Wales, insight work done in 2016, to inform *10 Steps to a Healthy Weight for Every Child*, found limited parental recognition of public concern or awareness if a child aged 0-5 years was above a healthy weight and found that the language used to describe weight at this age can include more positive sounding phrases like tall for age, big boned etc.[9] (Figure 1). The 10 Steps to a Healthy Weight Baseline Survey found that while parents estimated the level of overweight or obesity to be slightly higher than measured rates (26% in the CMP 2016) only 4% identified that their child was overweight. The conclusion drawn from this is that parents find it hard to recognise whether their child is a healthy weight and may be less willing to accept that they are overweight or obese when this is identified.

2

Overweight and Obesity in Wales

OBESITY

The scale of the problem in Wales

1 in 8

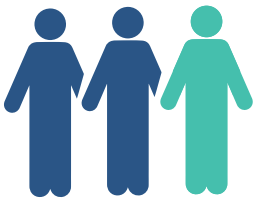
children aged 4-5 is obese,
over 4,000 children

600,000

adults aged 16+ are obese,
around 1 in 4

1 in 3

adults aged 45-64 years
is obese



10,000

more adults
become obese each year*

Around 60,000

adults aged 16+ are
severely obese

*On average since 2003.

Overweight and Obesity in Wales

Information on the Height and Weight of the Welsh population comes from three main sources.

The **Wales Child Measurement Programme** (WCMP) measures the height and weight of children in Wales when they start school (4-5 years). The latest survey included information on 94.1% of children in Wales.

The **Health Behaviour in School-aged Children** Survey (HBSC) asks a sample of children in Wales aged 11 – 16 years what they weigh and how tall they are. This information is used to calculate BMI. This survey is part of an international study and takes place every four years.

The **National Survey for Wales** (formerly the Welsh Health Survey) collects information from a representative sample of adults (age 16+ years) about their height and weight and uses this to calculate BMI. The Welsh Health Survey ceased in 2015 and was replaced by the National Survey for Wales in 2016/17, from these two surveys are not comparable due to changes in methodology, hence in some instances the report refers back to 2015 data.

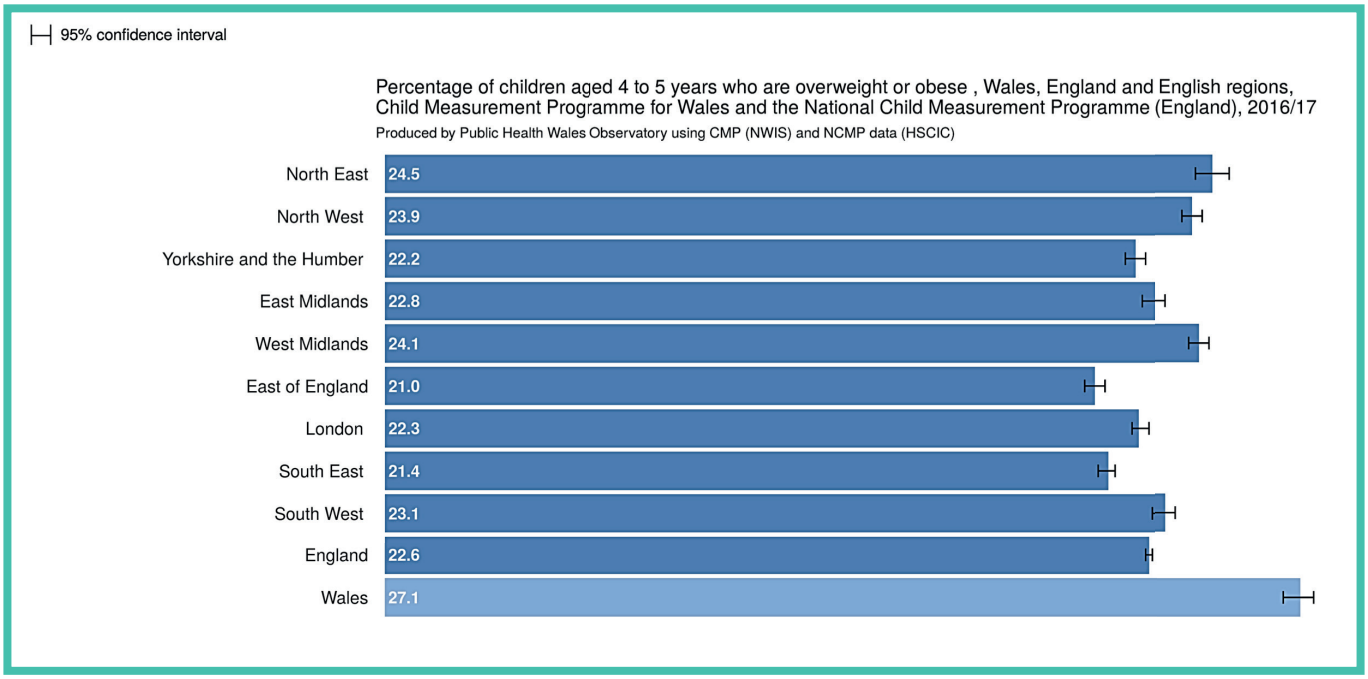
Self-reported height and weight is less reliable than objectively measured height and weight and is likely to give an under-estimate of the scale of the problem.

2.1 Children aged 4-5 years

The results from the 2016/17 WCMP of 4-5 years olds show that:[11]

- In Wales a quarter of children aged 4-5 years old (27.1% are classified as overweight/obese in Wales (Figure 2).
- The proportion of children aged 4-5 years classified as overweight and obese is significantly higher in Wales than in England or in any of the English regions (Figure 2).
- The proportion of children who are obese in Wales (12.4%) is significantly higher than the in England (9.6%).
- The most recent figures are the highest recorded levels of childhood obesity since the start of the programme.

FIGURE 2: Percentage of children aged 4-5 years who are overweight or obese, Child Measurement Programme for Wales and National Child Measurement Programme (England), Wales, England and the English Regions, 2016/17



Experience from the National Child Measurement Programme in England (NCMP) has demonstrated that the prevalence of obesity and overweight in school age children increases between reception year and year 6. In the English NCMP in 2012/13 in reception class, 22.2% of the children measured were either overweight or obese. By year 6, this proportion was 33.3%.[12] The National Child Measurement Programme for Wales (WCMP) commenced in 2012, children are measured when they are 4-5 years but currently in Wales are not measured again.

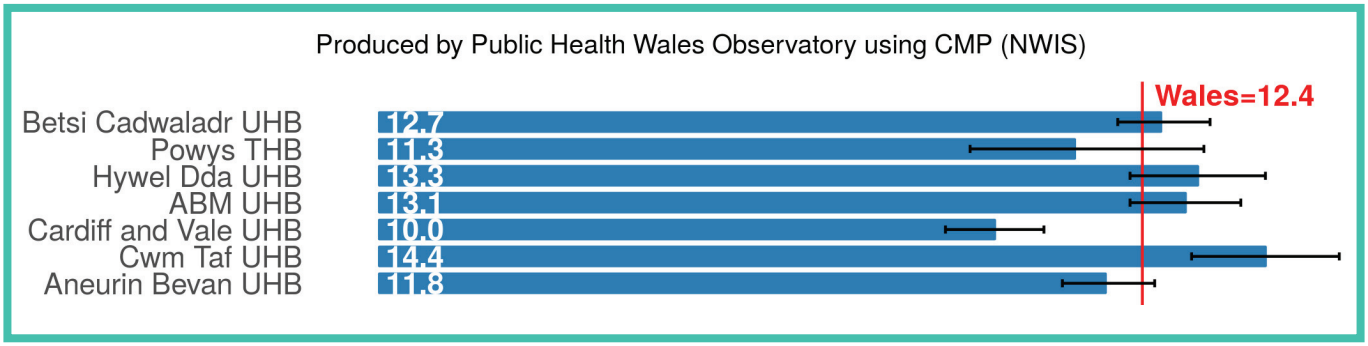
A 2009 feasibility study into repeat CMP collection in Year 4 (children aged 8-9 years) was conducted by Public Health Wales.[13] The study demonstrated that the prevalence of obesity in children increases as they get older. Some children who were identified as overweight in reception year, achieved a healthy weight by year 4, however 82.5% of those children who were identified as obese in reception year were still classified as obese in year 4, and a third of children deemed to be overweight were classified as obese by the time of the year 4 study.

This highlights both the importance of preventing overweight an obesity from birth, but also of preventing obesity specifically as this is very difficult to reverse once established.

2.1.1 Variation by geographical area

The rate of childhood obesity in children aged 4-5 years varies across health boards. Cwm Taf UHB (14.4%) is significantly higher than the average for Wales (12.4%) and significantly different from Cardiff and Vale (10.0%) and Aneurin Bevan health boards (11.8%). Cardiff and Vale has the lowest rate of children aged 4-5 years who are classified as obese. (Figure 3)

FIGURE 3: Percentage of children aged 4-5 years classified as obese, by health board, Wales, 2016/17

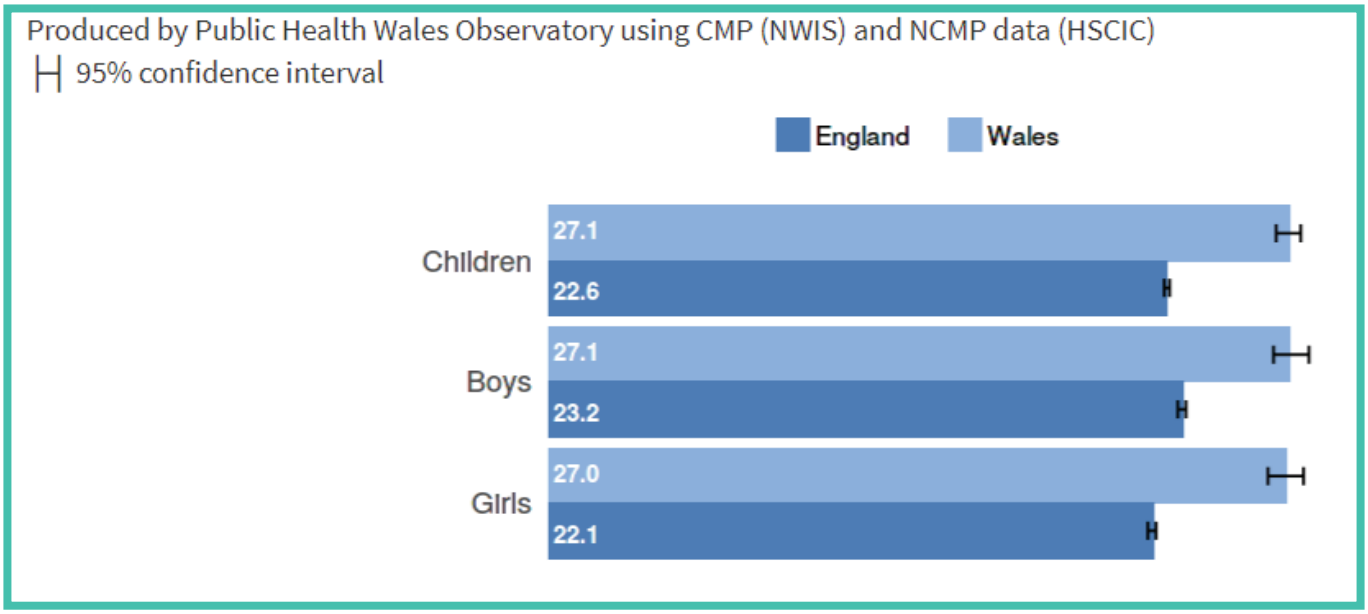


Source: Wales Child Measurement Programme

2.1.2 Variation by gender

Although there are more boys than girls classified as overweight and obese the difference is not statistically significant.

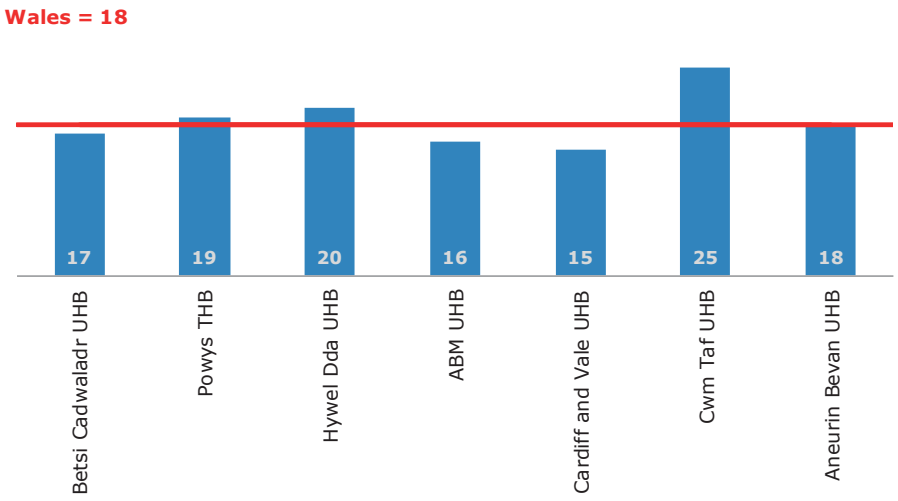
FIGURE 4: Percentage of children aged 4-5 years classified as overweight or obese, Child Measurement Prgramme for Wales and National ChildMeasurement Programme (England), Wales and England, 2016/17



2.2 Children aged 11-16 years

Information on height and weight for children aged 11-16 years comes from the self-reported heights and weights of participants in Health Behaviour School aged Children (HBSC). In 2013/14, 18% of children aged 11-16 years were classified as overweight or obese.[14] Information from the latest survey is expected later in 2018.

FIGURE 5: Percentage of children aged 11-16 years classified as overweight / obese, Wales and Health Boards, 2013/14

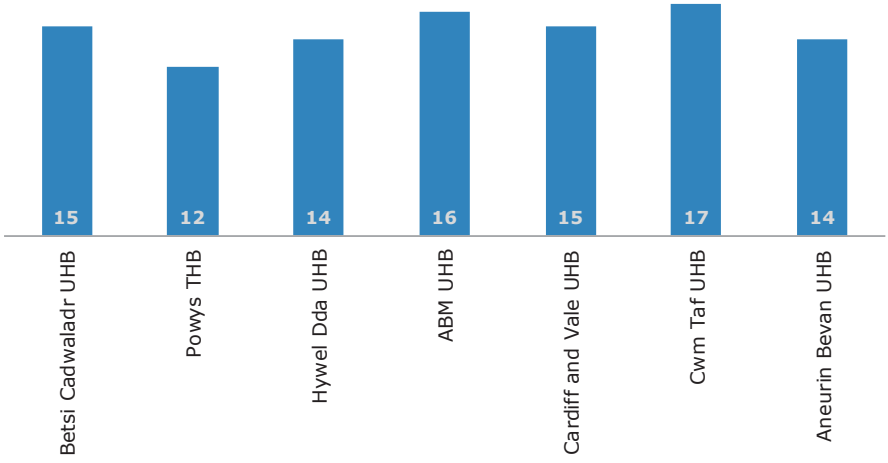


Produced by Public Health Wales Observatory, using HBSC (WG)

2.2.1 Variation by gender

There is a difference of 14 percentage points in levels of obesity in males aged 11 to 16 years and a 5 percentage point difference in the prevalence in 1 females between the Health Board areas. The Health Board with the highest percentage of overweight/obese girls aged 11-16 years is Cwm Taf (17%) and Powys has the lowest percentage (12%) (Figure 6).

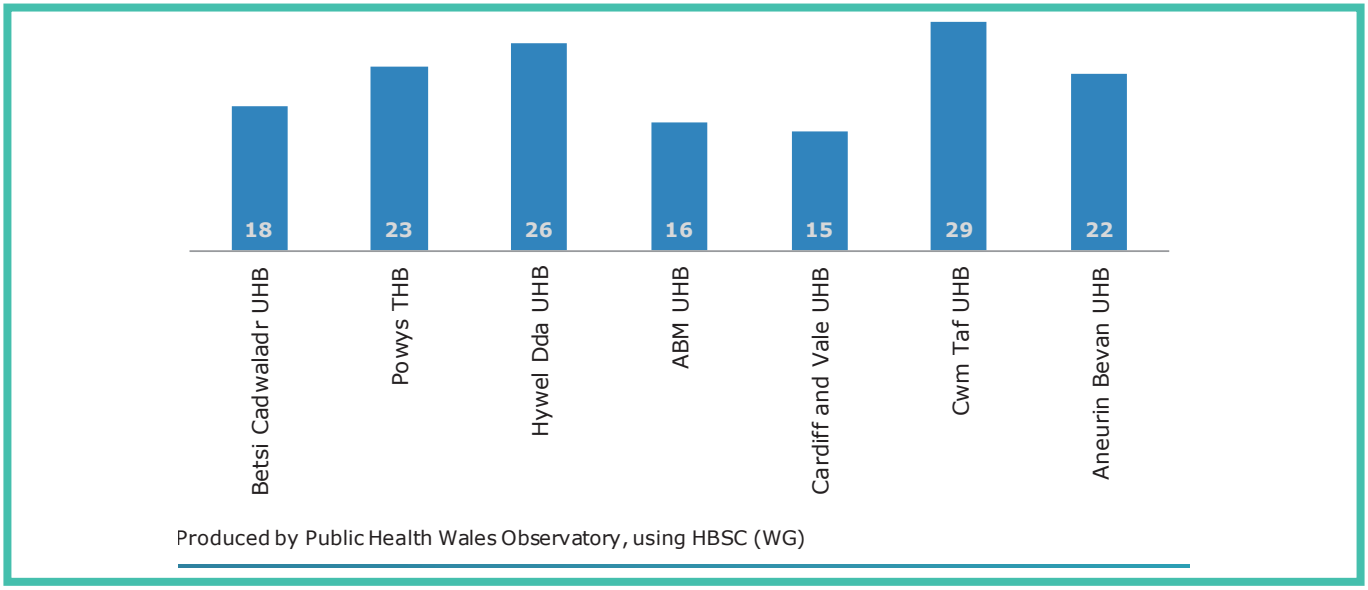
FIGURE 6: Percentage of girls aged 11-16 years classified as overweight /obese, by Health Board, Wales, 2013/14



Produced by Public Health Wales Observatory, using HBSC (WG)

The Health Board with the highest percentage of overweight/obese boys, aged 11 to 16 years, is Cwm Taf (29%); while the lowest percentage is Cardiff and Vale (15%) (Figure 7).

FIGURE 7: Prevalence of boys aged 11-16 years classified as overweight / obese, by Health Board, Wales, 2013/14



2.3 Adults aged 16+ years

In Wales, information from the National Survey for Wales (NSW) indicates that 6 in 10 people aged over 16 years (60%) are classified as overweight or obese and 1 in 5(22%) are classified as being obese.[15]

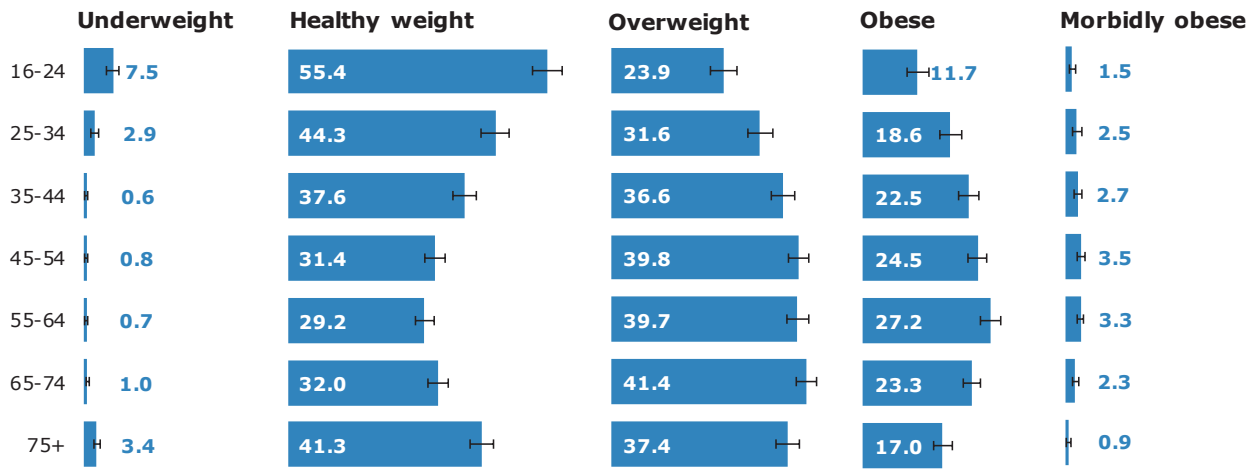
TABLE 1: Overweight and obesity in adults in Wales by age and sex (2017-18)

Per cent	Overweight or Obese	Obese
All aged 16+	60	22
Men	66	22
Women	54	23
By Age:		
16 – 44 years	52	18
45 – 64 years	69	27
65+ years	63	23

Source: Welsh Government. National Survey for Wales.
https://gov.wales/docs/statistics/2018/180627-national-survey-2017-18-population-health-lifestyle-en.pdf [Online]

A more detailed analysis of data from the Welsh Health Survey 2015 illustrates (Figure 8) how the proportion of the population who are a healthy weight declines with age before rising again after the age of 65 years. There is a significant change between 16 – 24 and 25 – 34 years of age in the proportion who are both overweight and obese. Levels of obesity peak in the 55 – 64 age group and are likely to be associated with significant obesity related health problems in this group.

FIGURE 8: BMI category by 10-year age groups, adults aged 16+ years, percentage and 95% confidence intervals, Wales, 2015



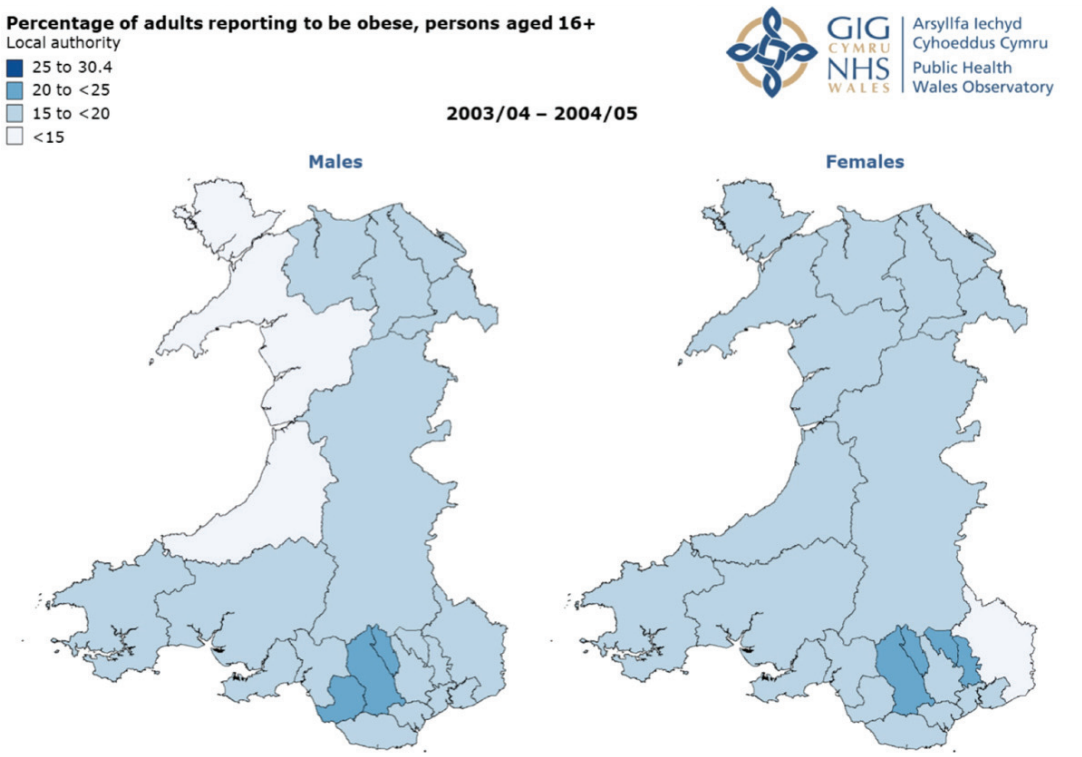
BMI: Underweight <18.5; healthy weight 18.5 to <25; overweight 25 to <30; obese 30 to <40; morbidly obese 40+

Applying prevalence data from the Welsh Health Survey (2015) to the whole population of Wales estimated that there are over 1.47 million adults in Wales classified as overweight or obese, with 60,000 people and 2.5% being classified as having a BMI of 40+ (morbidly obese).

2.3.1 Variation by geographical area

Figures 9 and 10 show both the variation in obesity prevalence by local authority (LA) in 2003/2005 and 2013/2014. Comparing the maps show an increase in obesity rates in almost all LAs, particularly in the south Wales valleys in Merthyr Tydfil, Caerphilly, Blaenau Gwent and Torfaen for males, and for females, Wrexham and Carmarthenshire show an increase in rates highlighting the change in the prevalence of the higher BMI categories (27 to 40+). Cwm Taf University Health Board (CTUHB) and Aneurin Bevan University Health Board (ABUHB) have the highest rates of adults classified as obese.

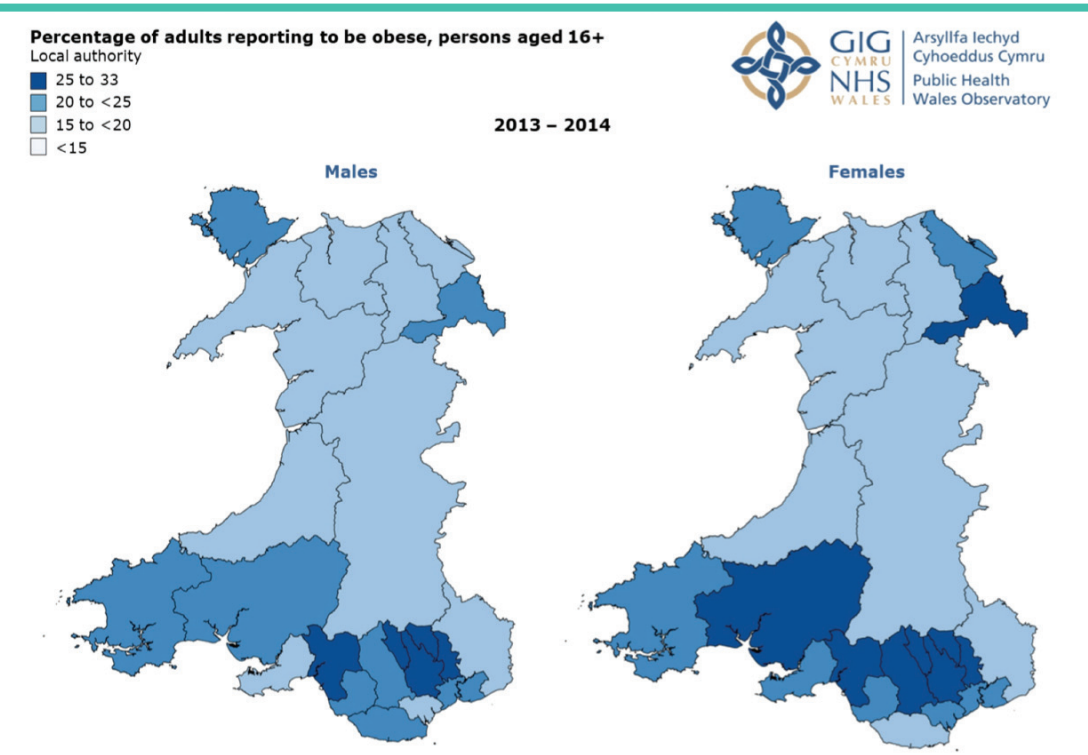
FIGURE 9: Percentage of adults reporting to be obese, persons aged 16+ years, 2003-05



Produced by Public Health Wales Observatory, using Welsh Health Survey (WG). ©Crown Copyright and database right 2014. Ordnance Survey 100044810

Obese: BMI 30+
Percentages are age-standardised using weights adapted from the 2013 European standard population.

FIGURE 10: Percentage of adults reporting to be obese, persons aged 16+ years, 2013-14



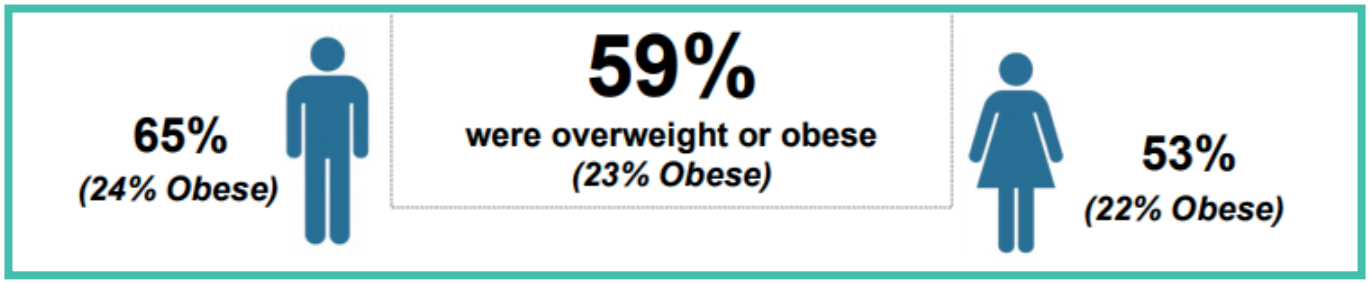
Produced by Public Health Wales Observatory, using Welsh Health Survey (WG). ©Crown Copyright and database right 2016. Ordnance Survey 100044810

Obese: BMI 30+
Percentages are age-standardised using weights adapted from the 2013 European standard population.

2.3.2 Variation by gender

In Wales, the pattern of increased overweight and obesity in males continues in people aged 16+. There are more men than women who are overweight or obese (Figure 11). There is at least a 10% difference, while the levels of obesity in males and females are similar.

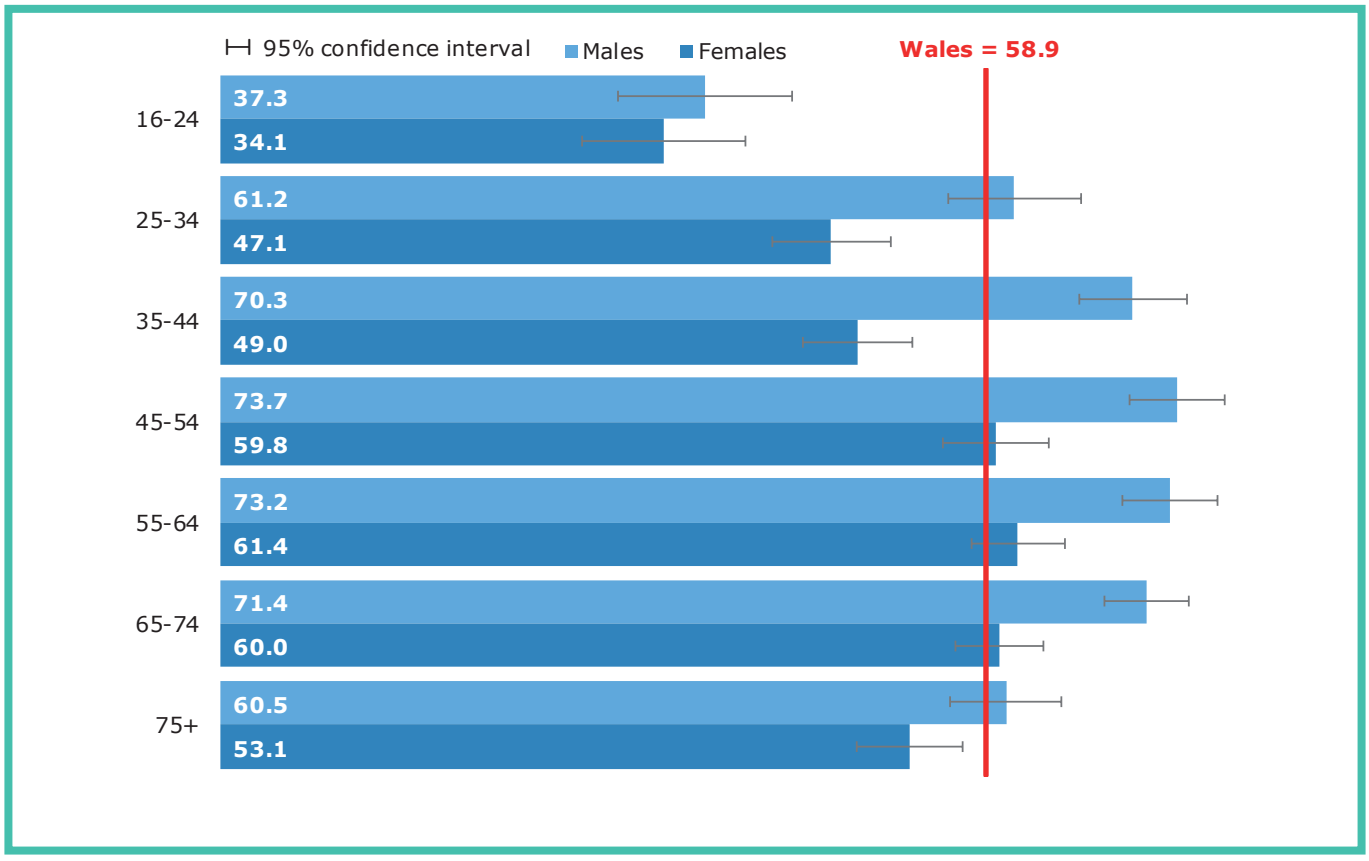
FIGURE 11: Percentage of adults aged 16+ years classified as overweight /obese, males and females, Wales, 2016/17



Source: Welsh Government. National Survey for Wales, 2016.

The proportion of overweight males is statistically higher than females. This difference in prevalence of overweight men and women is noticeable from age 25+ and persists until age 75+. As the data is self-reported in the survey, this could be a true difference, or that females tend to underestimate their weight.

Figure 12: Adults reporting to be overweight or obese by age and sex,percentage, persons aged 16+ years, Wales, 2016/17



2.4 Trends in levels of Overweight and Obesity

Levels of obesity in Wales, in common with other nations, have been increasing over time.

a) Children aged 4-5 years

As the Child Measurement Programme has been running for six years, it may be possible now to detect trends. Obesity prevalence is statistically significantly higher in 2016/17 than in either of the previous two years (Figure 13). However the difference in obesity prevalence between 2016/17 and 2013/14 is not statistically significant, so no overall trend for the period can be confirmed. There is no statistically significant difference across the years in prevalence of healthy weight or overweight.

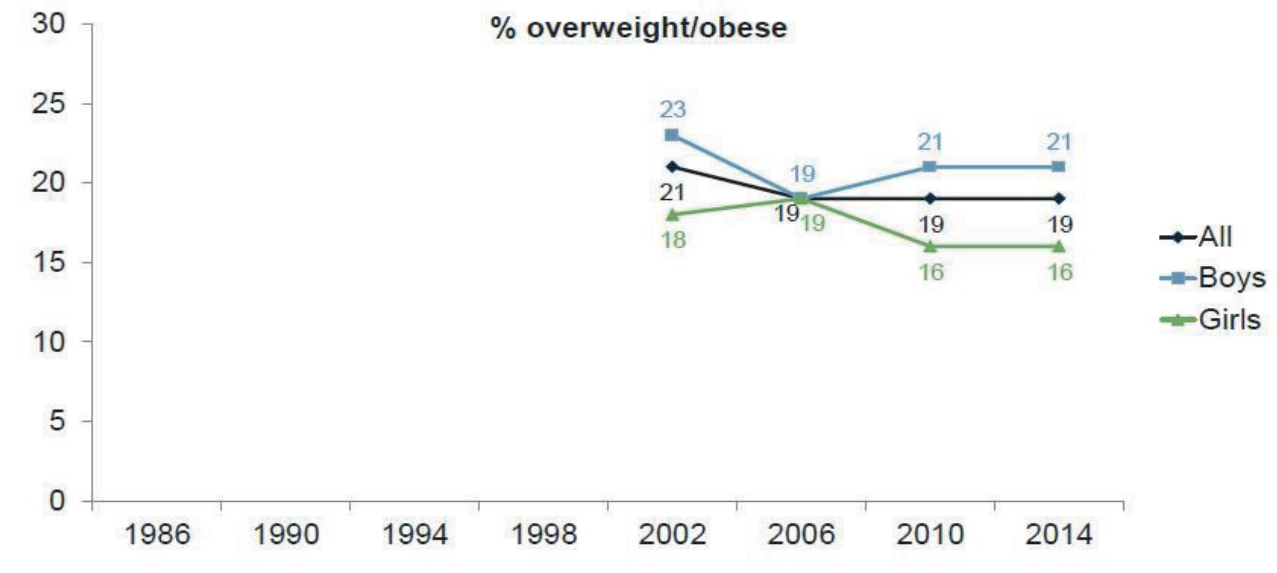
FIGURE 13: Percentage of children aged 4-5 years who are underweight, healthy weight, overweight or obese, Wales, 2013/13 - 2016/17

Produced by Public Health Wales Observatory using CMP data (NWIS)

b) Children aged 11 – 16 Years

Information on self-reported height and weight is available from the Health Behaviour of School-aged Children for 2002, 2006, 2010 and 2014. The results indicate that there has been no significant change over time. The next round of data will be available later in 2018.

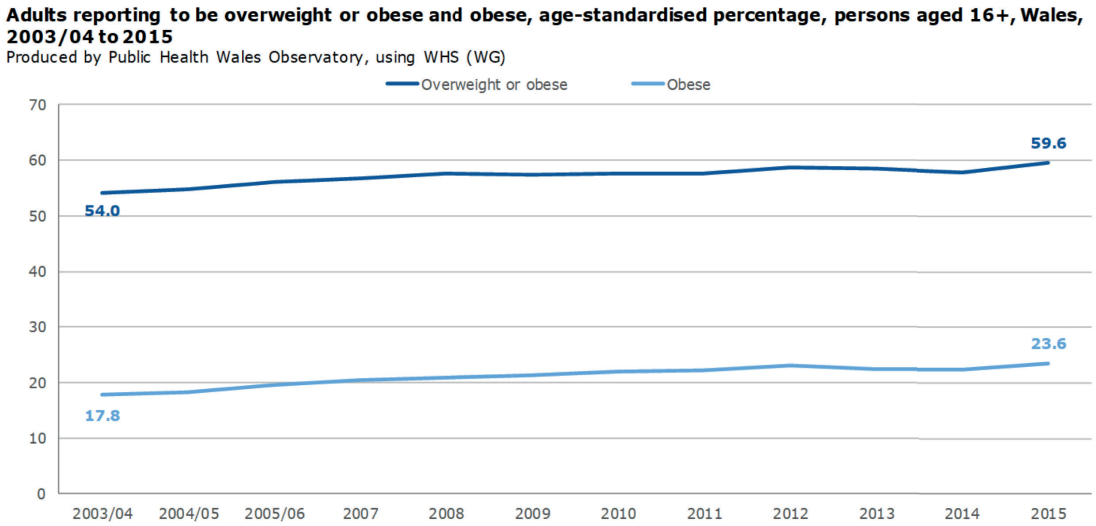
FIGURE 14: Percentage of young people aged 11–16 years who are overweight or obese by gender, Health Behaviour of School Age Children Survey, Wales, 2002 – 2014



c) Adults aged 16+ years

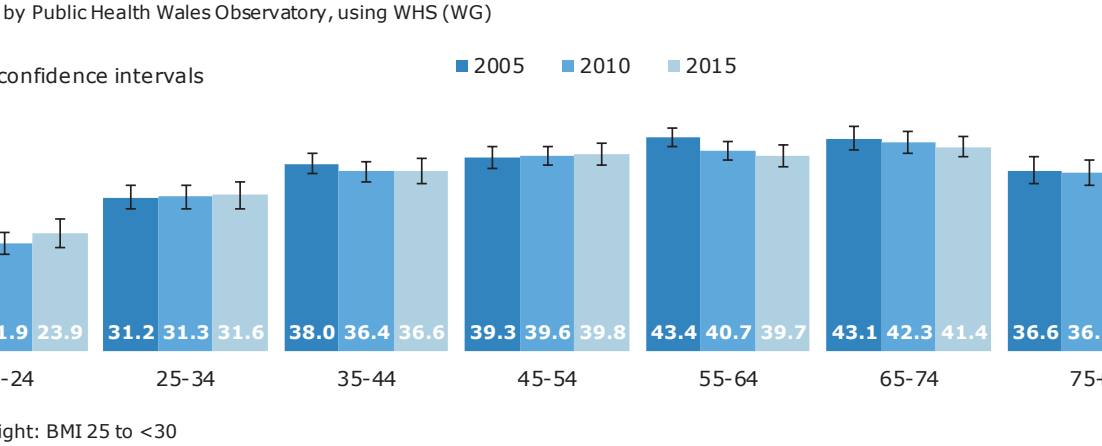
From 2003/04 to 2015, the percentage of overweight or obese adults aged 16+ has increased from 54.0% in to 60.0% in 2017. This equates to a 6 percentage point increase. There has been a similar increase in obesity from 17.8% to 23.6% over the same period. During this same period Wales had a 3.6% decrease in adults aged 16+ of a healthy weight from 43.8% to 40.2%.

FIGURE 15: Adults reporting to be overweight or obese and obese, agestandardised percentage, persons aged 16+ years, Wales, 2003/04 - 2015



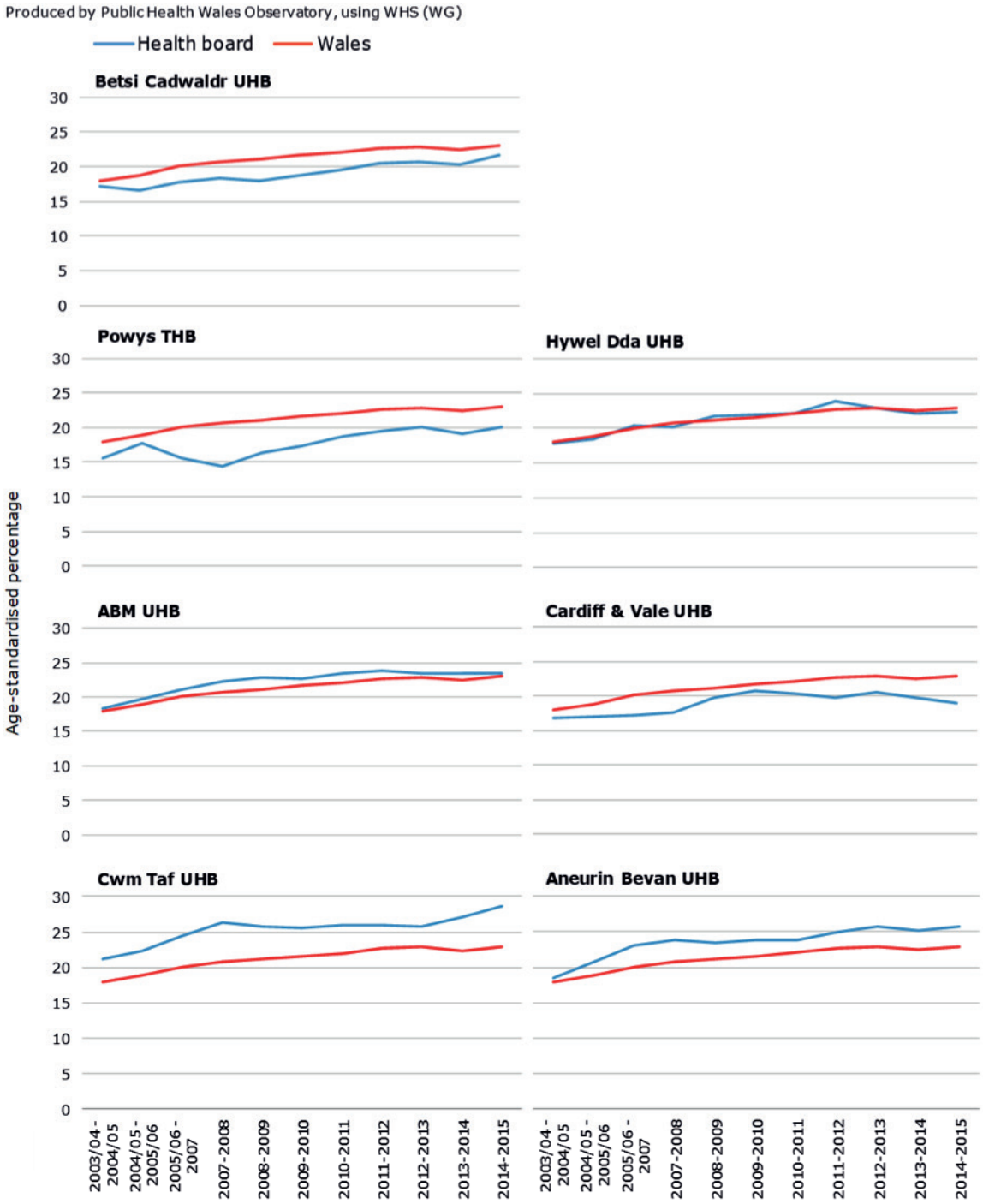
The percentage of overweight/obese increased between 2005 and 2015 in all age groups except the 35-44 years old and there is a significant increase in levels between 2010 and 2015 in the 16-24 age group. The small reduction in overweight/obesity amongst persons in the 35-44 age group in 2015 is not statistically significantly different from 2010. (Figure 16). The rate of increase (7.7%) in overweight and obese over the 10 year period was greatest in the 16-24 age group.

FIGURE 16: Adults aged 16+ years who are overweight or obese*, 10 year age groups, percentage and 95% confidence intervals, Wales, 2005, 2010 and 2015



The obesity prevalence trend by Health Board (Figure 17) shows a steady rise across most areas, with the exception of Cardiff and Vale UHB where a slight downward trend is emerging.

FIGURE 17: Obese adults, age standardised percentage, persons age 16+ years, Wales health boards, 2003/4 - 2004/5 to 2014/15

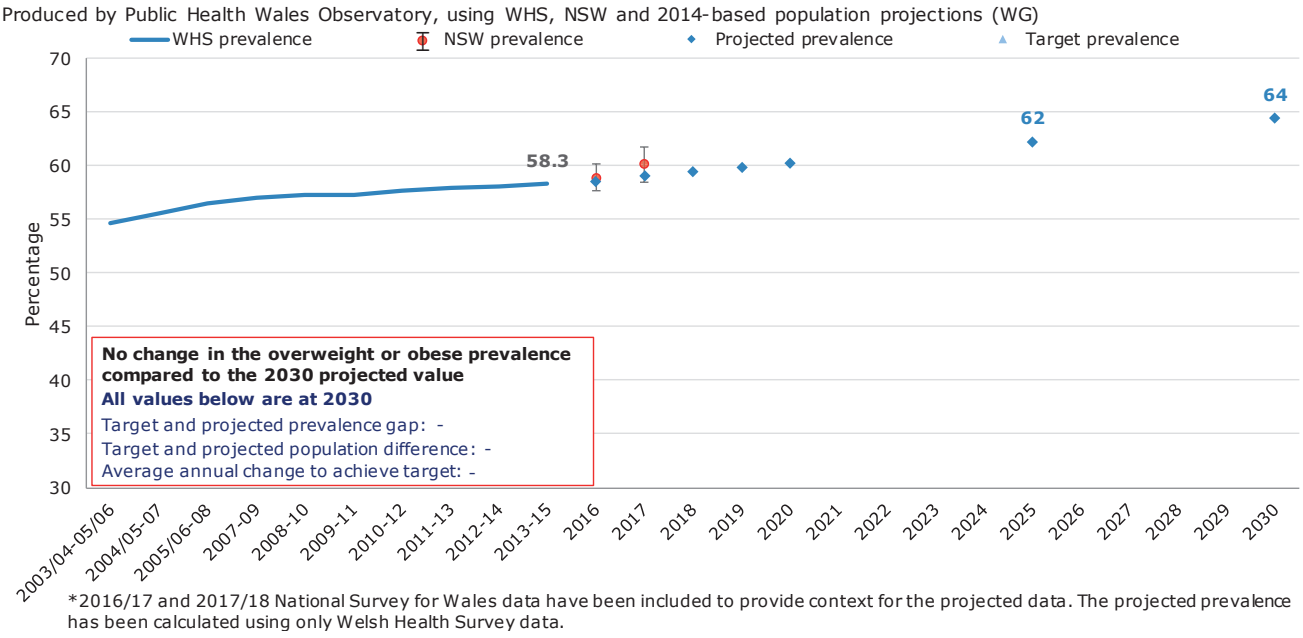


2.5 Future projections

Reversing the trend in the rise of obesity and the fall in the proportion of people of a healthy weight, will need a long term approach; this is in keeping with the Wellbeing of Future Generations Act (Wales) 2015.[16] Currently we have only 6 years' worth of data from the CMP and so projections to 2030 for childhood obesity were not made at this time.

Obesity prevalence in Wales is projected to rise by an additional 160,000 people to 1.63 million by 2030, increasing from 59% in 2015 to 64.4%[17] if past trends continue unchanged. (Figure 18)

FIGURE 18: Adults reporting to be overweight or obese, percentage, persons aged 16+ years, Wales, observed 2003-4 and projected 2016 – 2030*



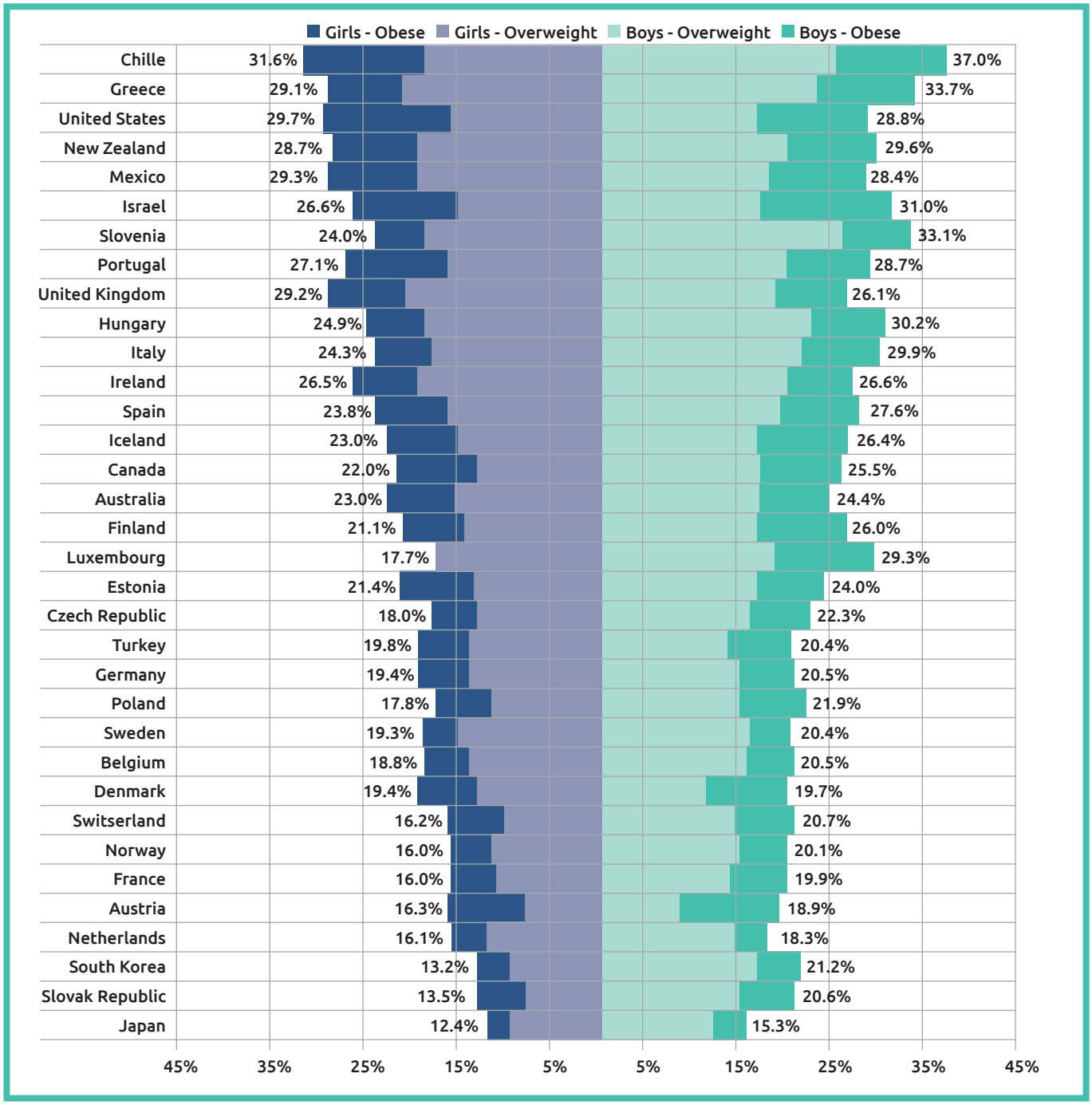
*2016/17 and 2017/18 National Survey for Wales data have been included to provide context for the projected data. The projected prevalence has been calculated using only Welsh Health Survey data.

To maintain the current adult overweight or obese prevalence of around 60%, the projected prevalence needs to decrease by approximately 6% by 2030. At a population level, this equates to an estimated 160,000 fewer adults that are overweight or obese. To meet this target, 10,000 adults would need to maintain/become a healthy weight each year. Despite this, there would still be an estimated 1,500,000 overweight or obese adults in Wales.

2.6 International comparisons

Epidemiological trends in obesity show that obesity rates are rising globally. Global obesity rates are obtained from a range of data sources. Caution is thus needed when comparing rates across countries as national prevalence estimates vary in their timing and frequency, the methods of measurement, method used to classify BMI into categories such as overweight or obese and the age of the children included. When looking for country leveldata (Wales) to compare different countries worldwide, most data sources use data from the United Kingdom rather than Wales.

FIGURE 19: International comparisons, obesity in people aged 2-19 years, by OECD country, using IOTF cut offs, 2013

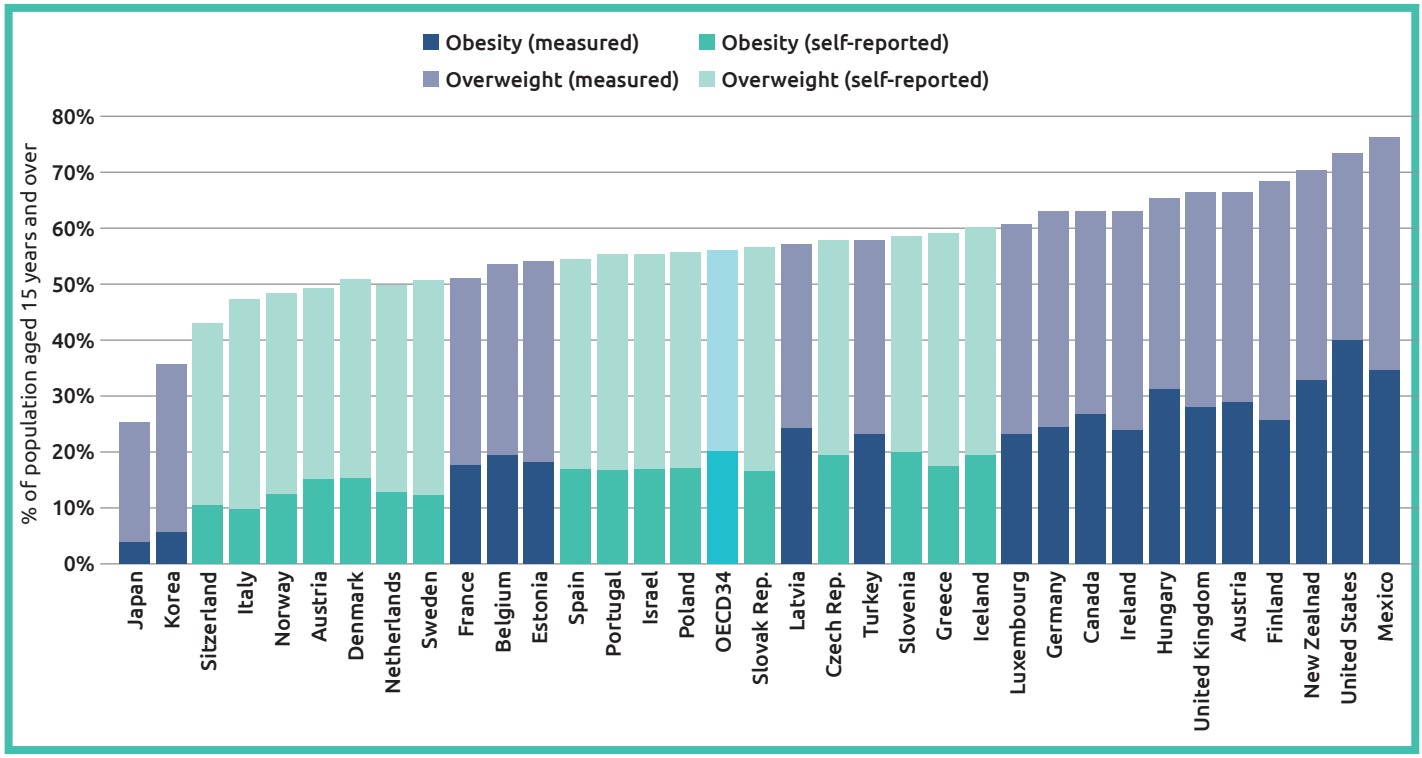


Source: The Lancet, Systematic analysis for the Global Burden of Disease Study 2013

International estimates of overweight and obesity prevalence in children are mainly based on national surveys of measured height and weight among children at various ages.[18] The USA has the highest percentage of children aged 2-19 years classified as being obese with 12.9% of male children categorised as obese and 12.4% of female children. Finland had the highest percentage of overweight males at 20.61% and UK had highest percent of females (19.95%) (Figure 19).

Adult obesity is defined consistently across Scotland, England, Wales and Northern Ireland using the BMI scale. However, height and weight measurements are self-reported in the historic Welsh Health Survey and current National Survey for Wales and are therefore not directly comparable with equivalent statistics in Scotland, England and Northern Ireland, where direct measurements are taken.[19]

FIGURE 20: Organisation for Economic Co-operation and Development (OECD) Overweight and Obesity, 2015



Source: https://www.oecd.org/unitedkingdom/Health-at-a-Glance-2017-Key-Findings-UNITEDKINGDOM.pdf

The United Kingdom has the sixth highest rate of obesity and overweight, compared to other Organisation for Economic Co-operation and Development (OECD) countries (Figure 20). Total overweight (BMI≥25) ranges from 24% in Japan and 33% in Korea to just over 70% in Mexico and the United States. Obesity (BMI≥30) is lowest in Italy, Japan and Korea (under 10%), and highest in Hungary, Mexico, New Zealand and the United States (30% or over).

3

Impact on health and wellbeing

OBESITY

Impact on health and wellbeing in Wales

Having a higher BMI

is the **leading risk factor** for having a long term illness[1]

Over 100,000

cases of **type 2 diabetes** are estimated to be associated with obesity

Having a musculoskeletal[2] illness is 1.5x more common

in those who report to be obese compared to those who do not[3]

Obesity is the second biggest preventable cause of cancer (UK)

More than 1 in 20 cancer cases are caused by excess weight

[1] High BMI is overweight and obese
[2] MSK condition includes arthritis, rheumatism, fibrositis, back problems, slipped disc, spine, neck or other problems of bones/ joints/muscles
[3] National Survey for Wales (16/17)

3

Impact on health and wellbeing

Being overweight and obese has an impact on life expectancy, morbidity, mortality and health and social care costs.

Obesity and being overweight has associated health risks at an individual level.[20] Obesity causes an increased risk of high blood pressure cancers, joint disorders, high cholesterol, coronary heart disease (CHD), depression and bullying in children.

Mild obesity is associated with the loss of one in ten, and severe obesity the loss of one in four potential disease-free years during middle and later adulthood (40 – 75 years). This increasing loss of disease-free years as obesity becomes more severe occurs in both sexes, among smokers and non-smokers, the physically active and inactive, and across socioeconomic groups.[21]

3.1 Associated risk of medical conditions related to obesity

Table 2 shows the extent to which obesity increases the risk of developing a number of diseases relative to the non-obese population. These relative risks are based on a comprehensive review of international literature carried out by the UK National Audit Office to provide the best estimates that could be applied to England.[22] For example, it is estimated that women classed as obese are almost 13 times more likely to develop Type 2 diabetes than women who are not obese.

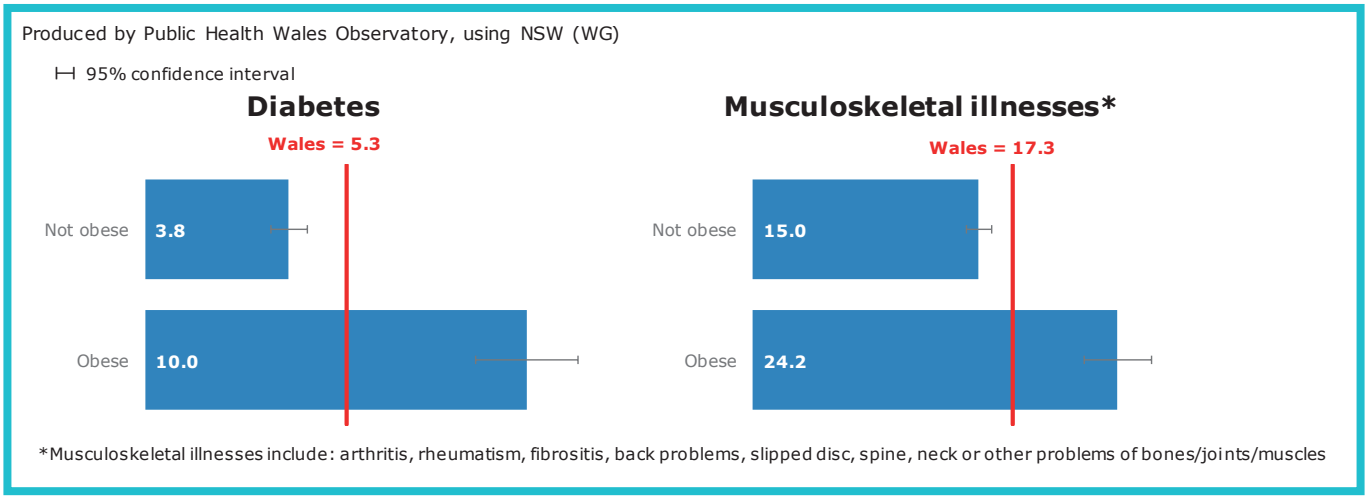
TABLE 2: Relative risk factors* for people who are obese of developing selected diseases, by gender, England

Condition	Male	Female
Type 2 diabetes	5.2	12.7
Hypertension	2.6	4.2
Myocardial infarction	1.5	3.2
Cancer of the colon	3.0	2.7
Angina	1.8	1.8
Gall bladder diseases	1.8	1.8
Ovarian cancer	-	1.7
Osteoarthritis	1.9	1.4
Stroke	1.3	1.3

Source: National Audit Office, NAO. Copyright © 2006. UK National Audit Office* The basis of the estimates varies due to differences in the methodologies of the studies selected, but the table gives a broad indication of the strength of association between obesity and each of the diseases.

In Wales there are significantly more people classified as obese who are living with a chronic condition such as diabetes or musculoskeletal conditions, MSK. Compared to the national average for having diabetes of 5.3%, 3.8% of people who are not obese have diabetes compared to 10% of people classified as obese (Figure 21).

FIGURE 21: Adults report to have diabetes and musculoskeletal illnesses by obesity, age-standardised percentage, persons aged 16+ years, Wales, 2016/17



3.2 Cost and burden

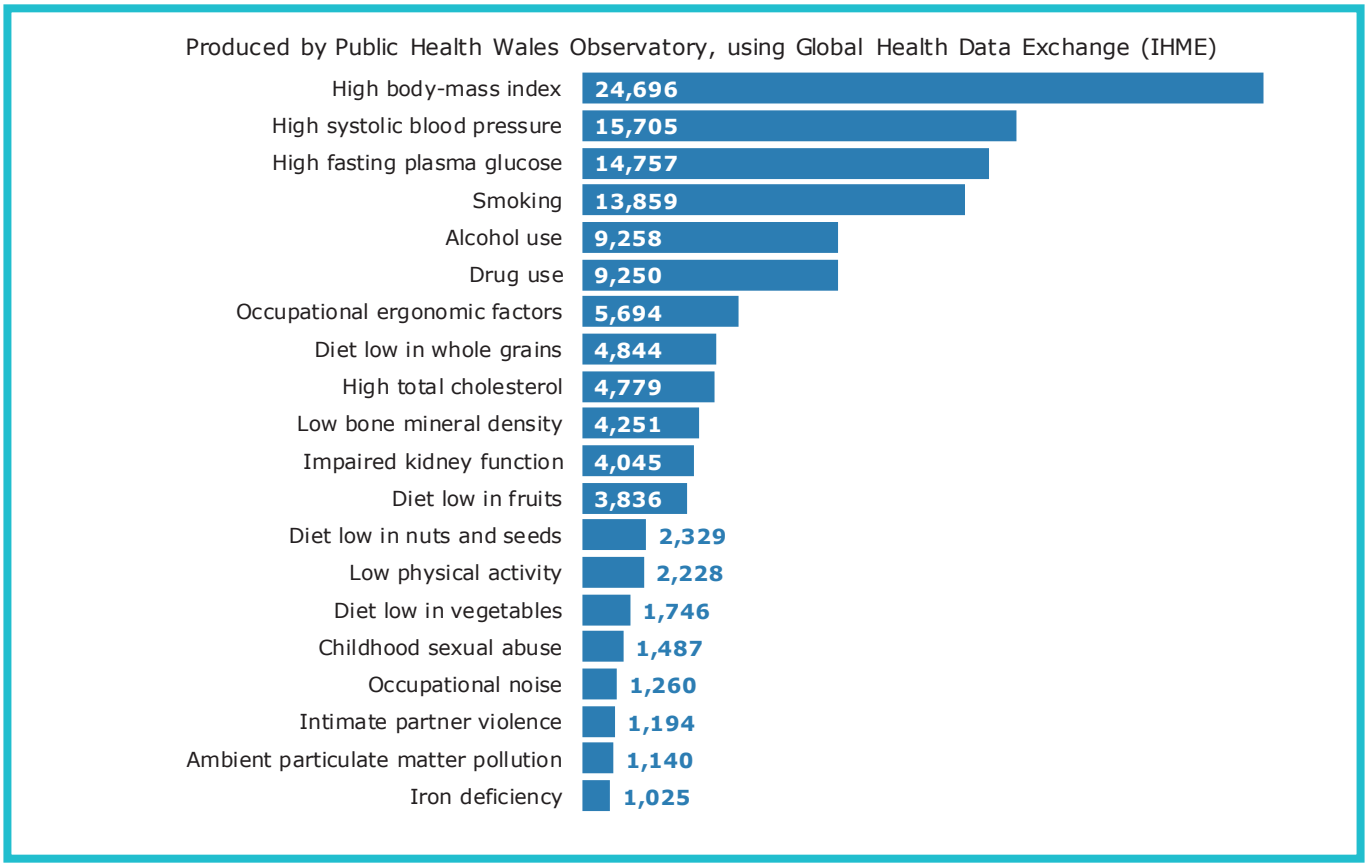
The cost of obesity and overweight, or burden of obesity and overweight should be measured both by the loss of life years and quality of life and by the financial impact of related disease on the health system (direct costs) and on society (indirect costs). It has been estimated that obesity accounts for 5.5 to 7.8% of all health care expenditures in the USA.[23]

Obesity is also associated with many less serious but limiting conditions such as shortness of breath, back pain, reduced mobility causing a poor quality of life, as well as an increased psychological and social burden.

3.2.1 Disability adjusted life years (DALYs) and Years lived with disability (YLD).

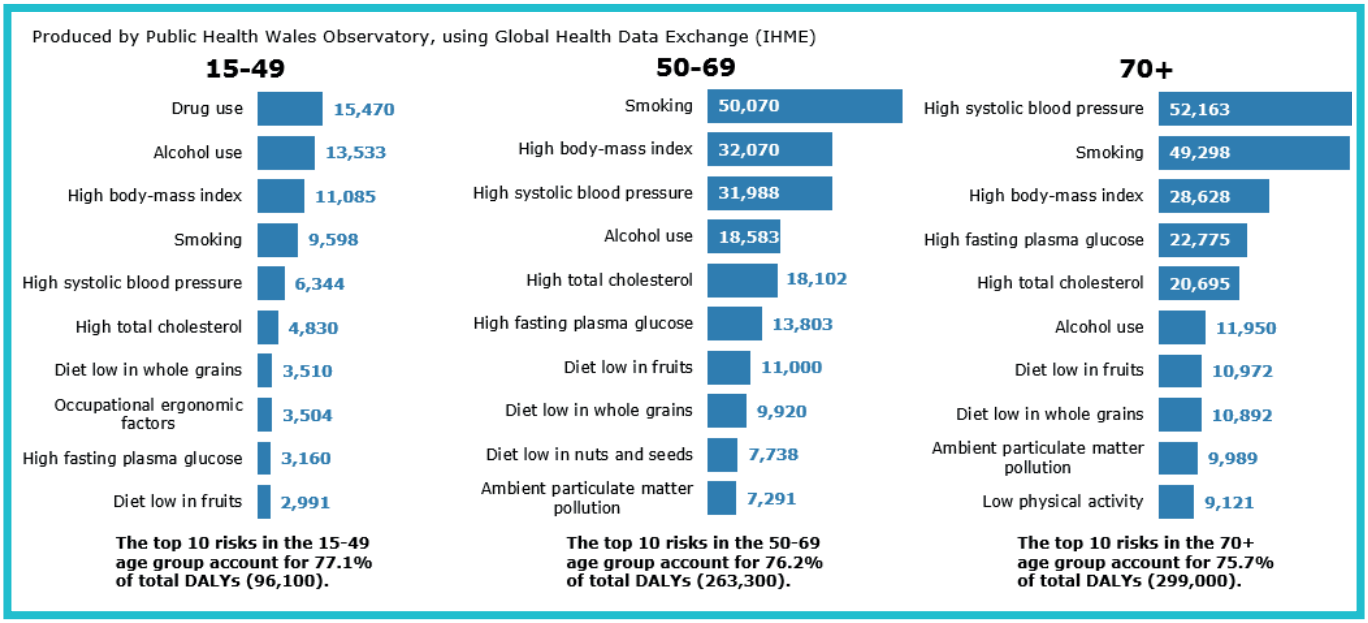
Having a high BMI can lead to an increased risk of death and is also the leading risk factor for years lived with disability (YLD) as it contributes greatly to a number of chronic diseases. Obese populations having significantly less/lower years free of disability than the healthy weight population. Figure 22 shows that in Wales, high body mass index is the leading cause of years lived with a disability (higher than smoking) and it ranks among the top three causes of healthy years lost.

FIGURE 22: Top 20 risk factors for years lived with disability (YLD), all persons, all ages, Wales, 2016



Alongside using YLD, disability adjusted life years, DALY, is used as a measure of the impact of a disease, health condition or injury in terms of healthy life years lost. One DALY can be thought of as one lost year of healthy' life due to ill health or injury. YLD is just one component of the DALY and focuses on the risk factors for chronic diseases but does not include deaths.

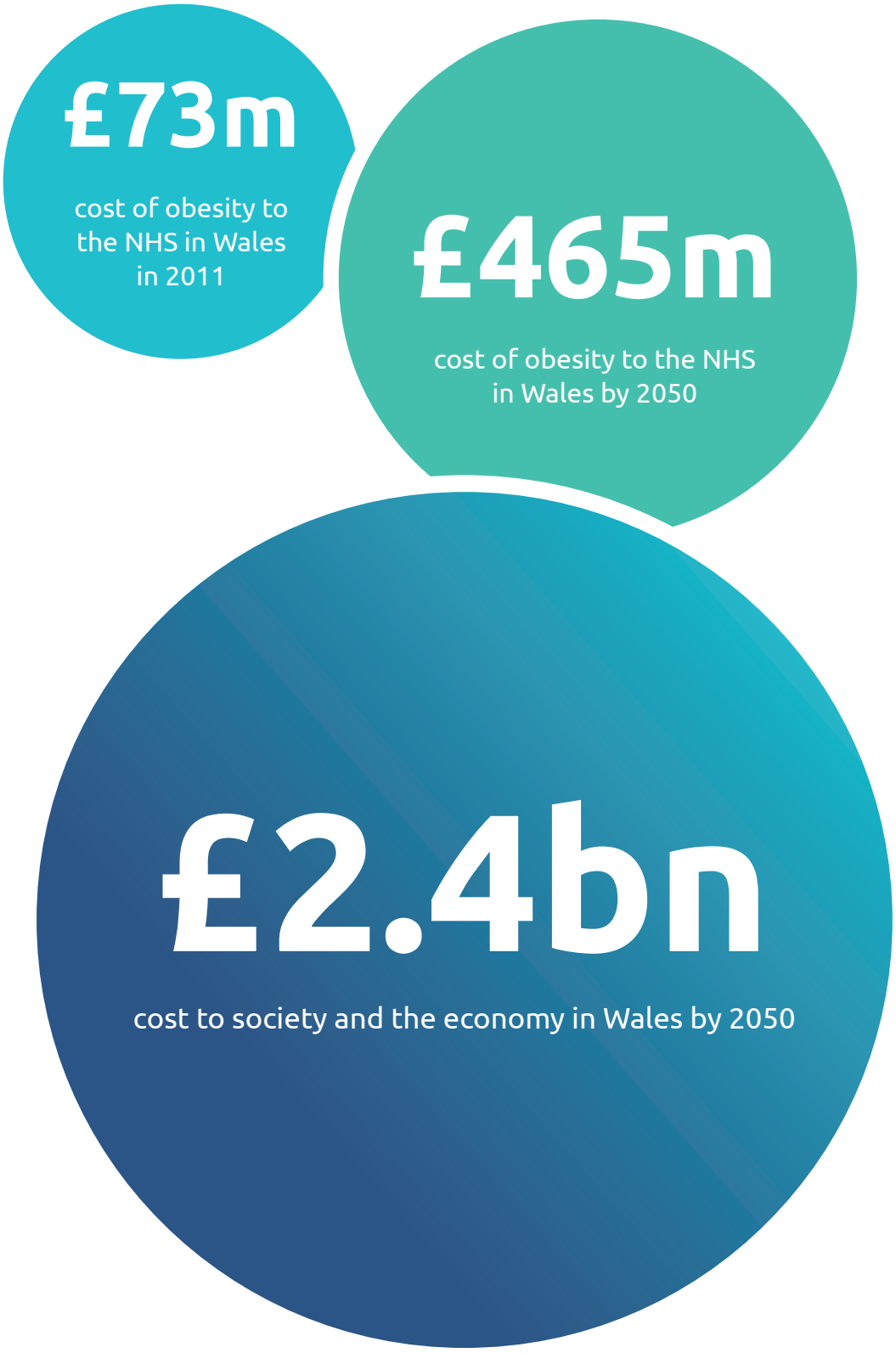
FIGURE 23: Top 10 DALY risks by age group, counts, all persons aged 15+ years, Wales, 2015



3.2.2 Cost of obesity and overweight

An academic study in Wales estimated that between £1.40 million and £1.65 million was spent each week treating diseases resulting from obesity, £25 and £29 per person and between 1.3% and 1.5% of total healthcare expenditure in Wales.[24] The study, commissioned by the Welsh Assembly Government, calculated in 2011, the cost of obesity to the NHS in Wales was £73m.[25] The study looked at a number of factors: including estimating the extent and duration of hospital admissions attributable to obesity in Wales; identifying the number of outpatient attendances by patients with illnesses related to obesity; estimating the number of GP and other primary care consultations as a result of obesity and identifying prescription costs for treating patients with obesity. Obesity also plays a role in the increasing social care costs. The increasing prevalence of obesity will lead to higher demands for health care interventions at younger to middle ages, i.e. ages under 65 years.[26]

FIGURE 24: The costs of obesity

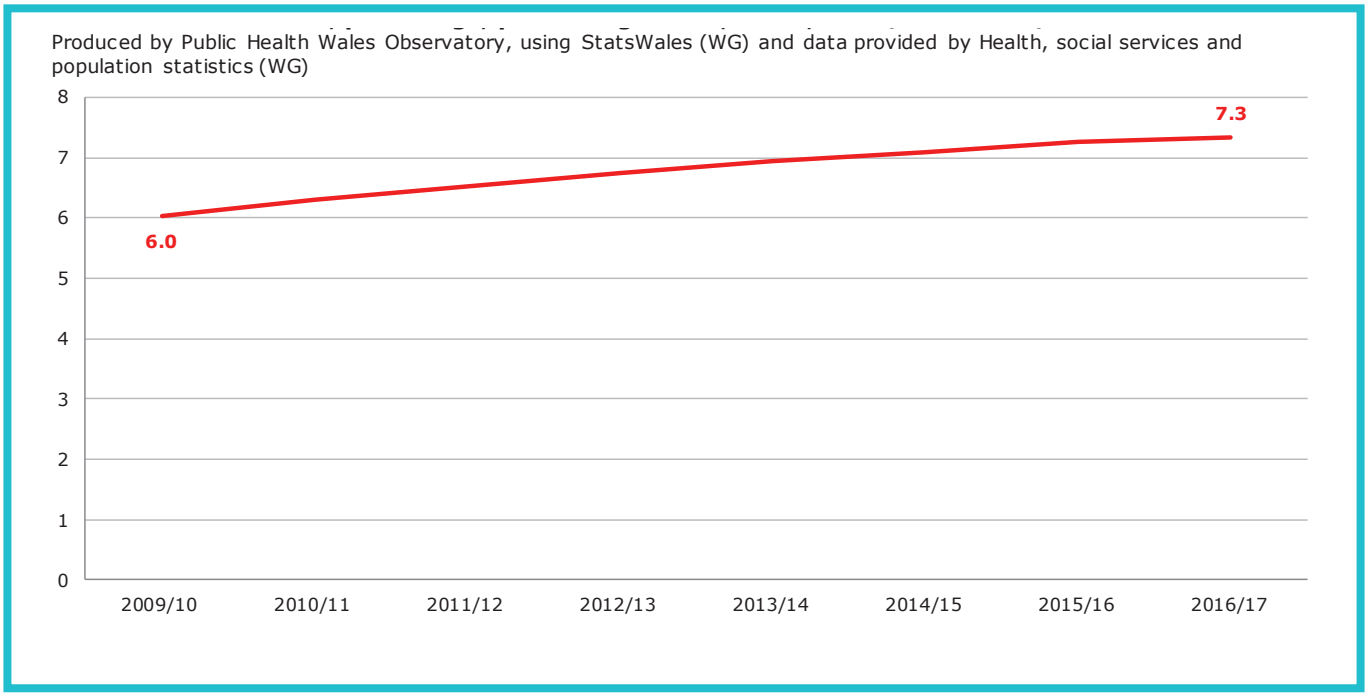


Public Health Wales (2016). Making a Difference.
http://www.wales.nhs.uk/sitesplus/documents/888/PHW%20Making%20a%20difference%20ES%28Web_2%29.pdf

3.2.3 Diabetes

The prevalence of diabetes continues to rise in Wales. Having a high BMI and increased abdominal circumference is a risk factor for Type 2 diabetes. The prevalence of diabetes in persons aged 17 and over as recorded on the Quality and Outcome Framework (QOF) disease register has increased from 6.0% to 7.3% in recent years (Figure 25). Please note that diabetes recorded on QOF includes Type 1 and Type 2 diabetes. Type 1 diabetes is not associated with obesity.

FIGURE 25: Prevalence of diabetes, percentage, persons aged 17+ years, Wales, 2009/10 - 2016/17



4

Causes of obesity

OBESITY
Causes of Obesity in Wales

1 in 3

new mothers breastfeed their babies.*
Breastfeeding reduces the risk of obesity in childhood

*exclusive breast feeding at 10 days and mixed at 6-8 weeks post birth

3 in 4 adults

do not eat 5 portions of fruit and vegetables a day

On average teenagers eat the equivalent of

15-18

cubes of sugar daily
3x the recommended amounts

On average children and adults eat the equivalent of

10-12

cubes of sugar daily
2x the recommended amounts

1 in 5 boys

1 in 10 girls

aged 11-16 does the minimum recommended level of **at least 60 minutes** of **physical activity every day**

5 in 10

primary school aged children **travel to school by car**

1 in 2

adults does not do the recommended amount of **physical activity each week**

Causes of obesity

Obesity may be seen as the result of an energy imbalance, where energy consumed (diet) exceeds energy expended (physical activity).

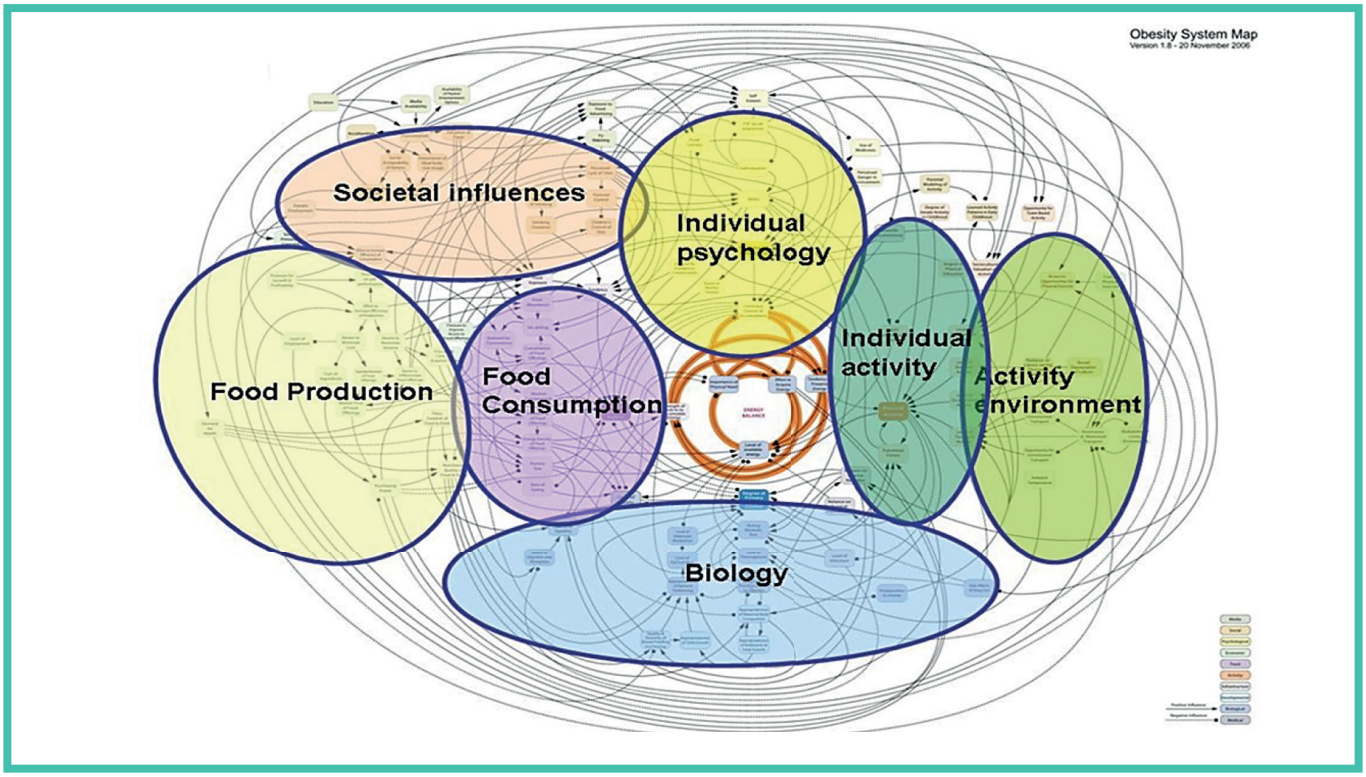
The specific causes of obesity at an individual level are many and varied and they vary between population groups and across a person's life course.

The Foresight report, Tackling obesities: future choices[27], outlined the causes of obesity as multiple, complex and interlinked and reaching far beyond public health. The research commissioned by Foresight revealed that the causes of obesity are embedded in an extremely complex biological system, set within an equally complex societal framework (see the Obesity systems map). The report successfully highlighted the contributions of a poor diet and physical inactivity as drivers of excess weight gain. It also:

- brought an awareness that some individuals are biologically more susceptible to weight gain,
- recognised the impact of the environment on personal 'choices', and
- provided a much greater acknowledgement of the interactions between the environment and the individual.

The Foresight system map, together with scientific and other evidence, confirms that energy balance (or imbalance) is determined by a complex multifaceted system of determinants (causes) where no single influence dominates.

FIGURE 26: Foresight Obesity map



Source: Foresight. Tackling obesities: Future choices project report. 2nded. London: Government Office for Science; 2007. The full obesity system map with thematic clusters, p121, figure 8.1

One of the major contributors to weight gain is the "obesogenic" environment in which we live. The term obesogenic environment refers to the role environmental factors may play in determining diet, nutrition and physical activity. Changes to this environment in terms of the availability and access to food and drink and tackling other contributory factors such as sedentary lifestyles and reduced physical activity have the capacity to sustainably affect various pathways within the obesity system map.

Data on diet, food consumption, nutrient intake and nutritional status is obtained from the National Diet and Nutrition Survey (NDNS) rolling programme, The National Survey/Welsh Health Survey (provides data on food and vegetable consumption) and from data set purchased from commercial and other surveys.

The status of a person's energy balance, ('energy in') determined by the diet as a whole, and physical activity levels ('energy out') affects their body weight; diet and nutrition and physical activity are one of the key drivers of obesity. Any movement will contribute to energy expenditure and will therefore contribute to energy balance. This section looks at both of these factors.

4.1 Diet, food consumption and nutrition

Food consumption and food production form part of the complex obesity system. Eating and drinking behaviour is crucial and the food and drink environment is also of major influence in reducing and preventing obesity. Patterns of shopping and eating have changed beyond recognition in recent decades. The food environment in which we live has changed and this has had an impact on the food we buy, prepare and eat.

- Structures of food production, storage and distribution have created an increasingly attractive, diverse and energy-dense food supply.
- Food is widely available, and promotion and advertising provide additional exposure to food desire
- The number and range of food outlets has increased
- Social norms related to eating have changed.
- Grazing, snacking, eating outside of the home are common and contribute a substantial proportion of total calorie intake.

There are a number of sources of data which highlight the food patterns and intake in the population. The national diet and nutrition survey (NDNS) is a continuous survey that provides information on diet, food consumption, nutrient intake and nutritional status of people aged 1 and a half years and over in private households in the UK. It provides high quality data on the types and quantities of foods consumed by individuals, from which estimates of average nutrient intakes for the population can be derived. The sample was boosted to get representative specific data for Wales. The Food and you survey[28] looks at dietary eating habits and results. The National Survey for Wales asks respondents about a range of food items to determine the overall amounts of fruit, vegetables and pulses consumed the previous day.

Key findings from National Diet and Nutrition Survey (NDNS) were:[29]

- The main sources of sugar consumed by children are soft drinks and fruit juice.
- The Welsh population continue to eat higher than recommended levels of sugar and saturated fat and do not meet the recommended levels of not enough fruit and vegetables and fibre consumption
- People living with the lowest income had significantly lower intake of fruit and vegetables, some micronutrients and higher sugar consumption compared to the more affluent areas.
- Alcohol provided on average about one tenth of the energy intake for men and women aged 19 to 64 years, 9.3% and 9.7% respectively and 5.4% of energy intake for those aged 65 years and over.
- Energy from alcohol intake in females in Wales was 9.7%, higher than UK as a whole (7.8%).

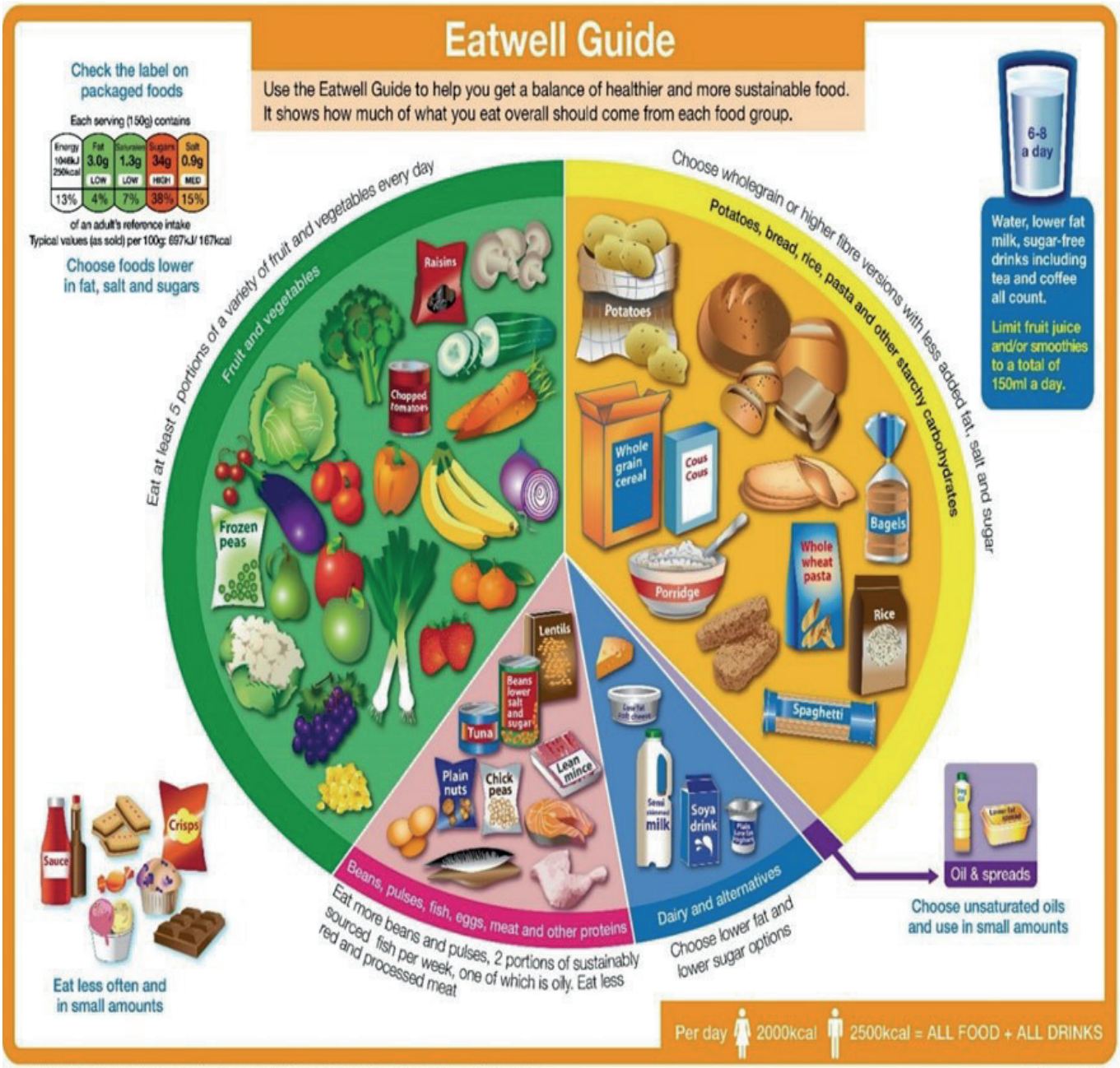
4.1.1 Nutritional guidelines

Dietary guidelines for the United Kingdom are recommended by the Scientific Advisory Committee on Nutrition[30] and adopted where agreed by the UK nations. The Dietary Reference Values (DRVs) for key macronutrients indicate the average or the maximum contribution that these nutrients should make to the population average intakes. Current dietary guidelines have been translated into the Eatwell Guide[31] (see Figure 27).

UK Dietary Reference Values (DRVs) for key macronutrients

Macronutrient	Dietary Reference Value
Total fat	Population average no more than 35% of food energy for those aged 5 years and over
Saturated fatty acids	Population average no more than 11% food energy for those aged 5 years and over
Trans fatty acids	Population average no more than 2% food energy for all ages
Free Sugars	Population average no more than 5% of total food energy for all ages

FIGURE 27: Eatwell Guide, 2016



Source: Public Health England in association with the Welsh Government, Food Standards Scotland and the Food Standards Agency in Northern Ireland.

4.1.2 Infant Feeding

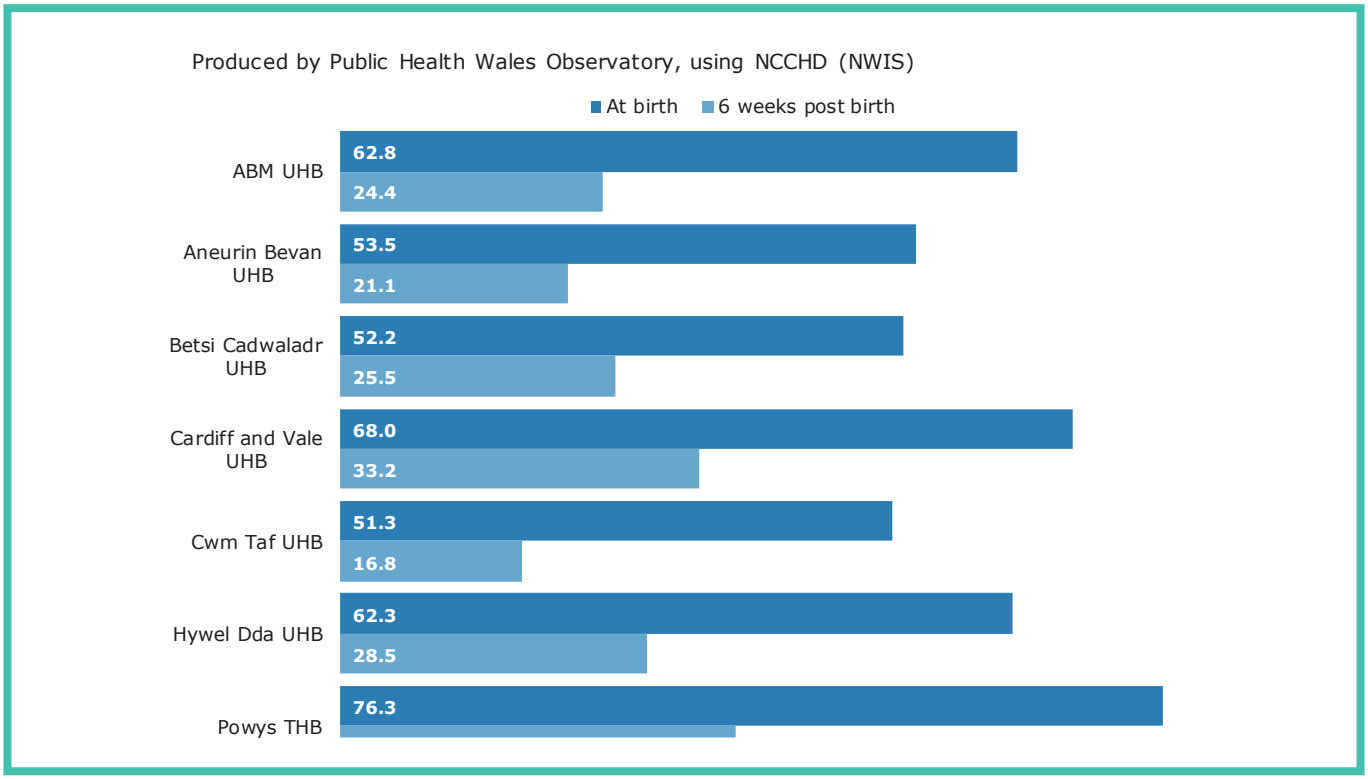
The risk of being overweight or obese is affected by poor nutrition in the early years of life. Being bottle fed, early weaning and rapid growth in the first year of life are all associated with increased risk of obesity and overweight in children.

Around 59% of mothers initiated breastfeeding in 2016/ 2017 in Wales.[32] There is variation in breastfeeding initiation rates by mothers' age with less than a half of mothers aged under 16 initiating breastfeeding compared to three quarters of mothers aged 45+.

In all Wales health boards, over 50% of mothers initiated breastfeeding. At 6 weeks following births, breastfeeding rates fell to less than half the initiation rate (Figure 28).

In 2016, the 10 Steps to a Healthy Weight was launched as a basis for system action to increase the proportion of children who are a healthy weight when they start school. Increasing breastfeeding rates is one of the interventions in the 10 Steps to a Healthy Weight.

FIGURE 28: Breast feeding rates, Welsh health boards, 2016/ 2017



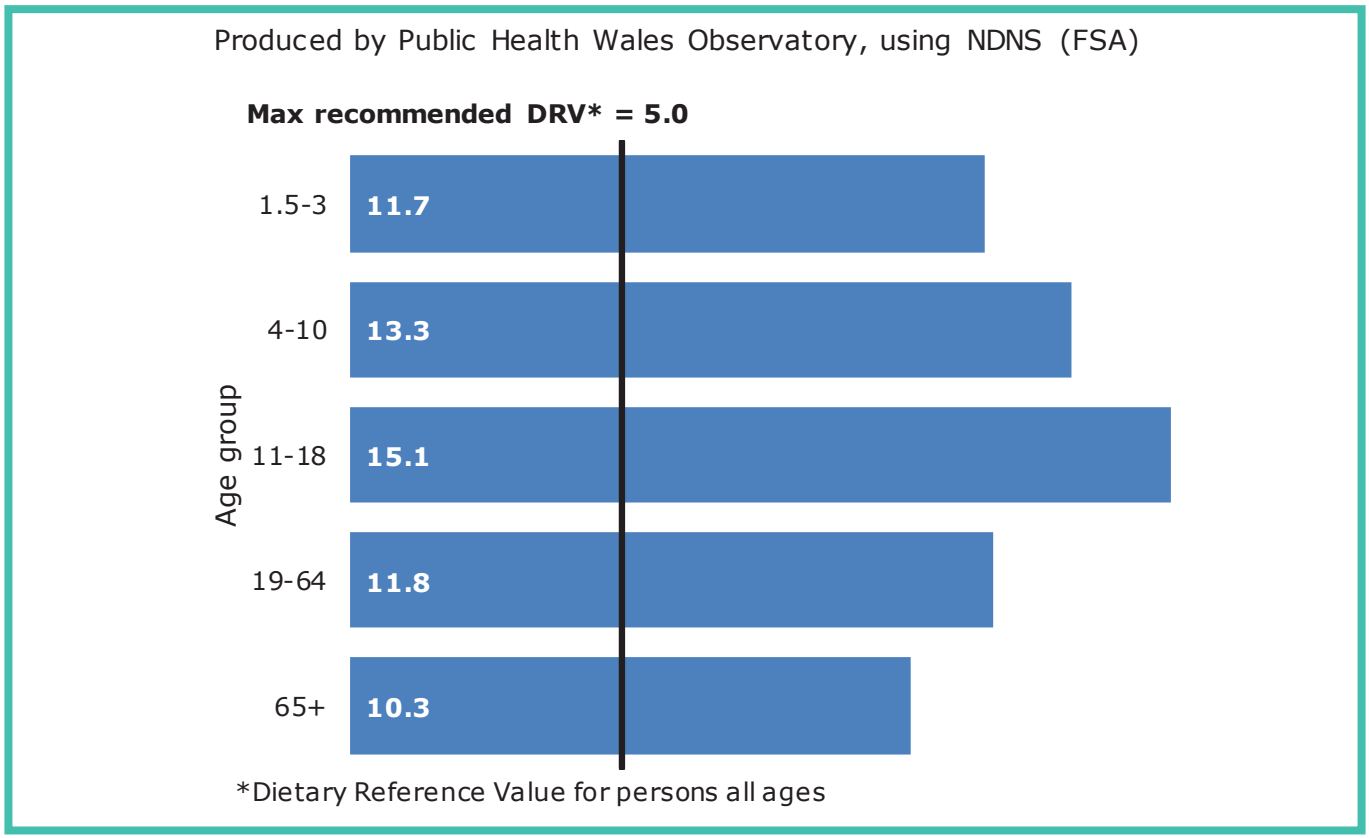
Source: National Community Child Health Database. Public Health Wales Observatory website

4.1.3 Consumption of sugar and sugary drinks

Food and drinks comprising mainly sugar e.g. sweets and sugary drinks, threaten the nutritional quality of the diet by providing energy without the benefit of other nutrients. Consuming too much free sugar and too many foodstuffs high in sugar can lead to weight gain. There is also an association between greater sugars/sweetened beverage consumption and higher incidence of type 2 diabetes mellitus.[33] In Wales, sugar intake is three times higher than the recommended value for teenagers aged 11-16 years and two times the recommended level for children and adults.

Sugar reduction is a key action outlined in the UK Obesity plan.[34] The plan introduces a soft drinks industry levy which came into effect in April 2018. Drinks with more than 8g of total sugar per 100ml will pay 24p per litre, with drinks between 5g and 8g sugar per 100ml paying 18p. Drinks with less than 5g sugar per 100ml are exempt.

FIGURE 29: Free sugars intake by age, percentage of food energy, persons aged 1.5 year and over, Wales, 2009/10 - 2012/13



Source: NDNS national diet and nutrition survey

Wales NDNS found the overall main source of sugar was soft drinks and fruit juice, cereals and cereal products (mainly 'buns, cakes, pastries and fruit pies', biscuits and breakfast cereals) and 'sugar, preserves and confectionery in children.[35]

4.1.4 Fruit and vegetable consumption

Fruit and vegetables form the basis of a healthy diet and have anti–obesity effect, consuming '5 A Day' is one of the recommendations for a varied and balanced diet. There is convincing evidence that the consumption of high levels of high-energy foods, such as processed foods that are high in fats and sugars, promotes obesity compared to low-energy foods such as fruits and vegetables which do not.

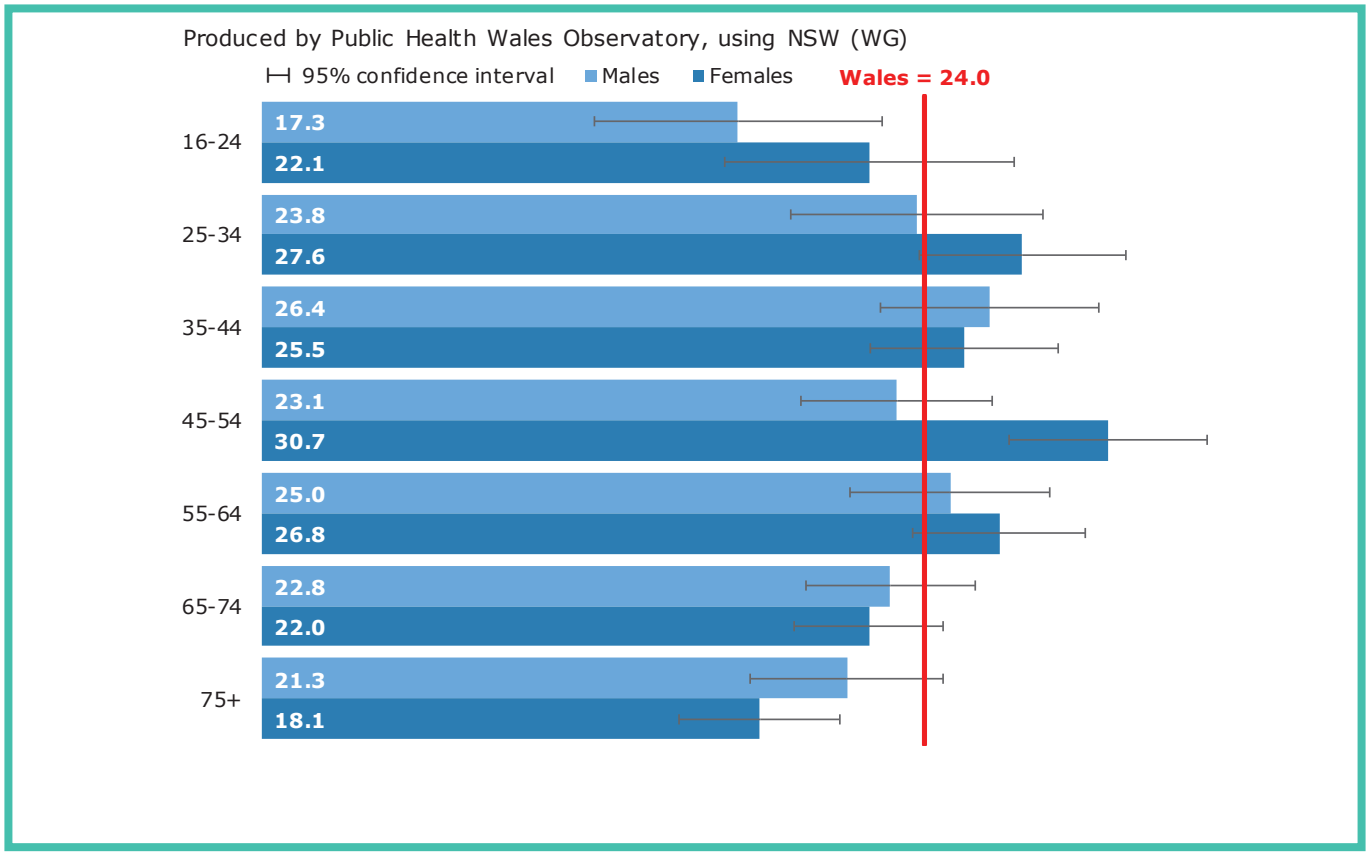
All data sources (NDNS, WHS, NSW, HSBC) reported lower fruit and vegetable consumption in Wales than recommended levels.

According to the NDNS, over three quarters (76%) of adults aged 19 to 64 years and adults aged 65+ (73%) are not meeting the 5 A Day, recommendation. This is much less than the self-reported figures of a third of adults and a quarter of teenagers meeting their '5 A Day recommendation presented in the WHS, NSW and HBSC respectively.

The National Survey for Wales asks respondents about a range of food items to determine the overall amounts of fruit, vegetables and pulses consumed the previous day. For each food item, respondents were asked whether they had eaten it and, if so, how much they had consumed.

In Wales 24% of adults aged 16 and over consume at least 5 portions of fruit and vegetables a day, with a lower proportion of people classified as overweight and obese 22% consuming the recommended levels of fruit and vegetables. [Note prevalence of fruit and veg consumption differed noticeably between the previous WHS and the current NSW (dropped from 32% in the last year of the WHS to about 24% in the new NSW)]. There is no significant difference in fruit and vegetable consumption in males and females in Wales.

FIGURE 30: Adults reporting to eat five portions of fruit or vegetables by age and sex, percentage, persons aged 16+ years, Wales, 2016/17



There is a significant difference in levels obesity by fruit and vegetable consumption, with increased rates in adults eating no portions; 7% higher than those eating 5+. This is less pronounced for overweight or obese adults (Figure 30).

Data from the annual WHS 2015 found that the younger 16+ age groups are consuming less fruit and vegetables compared to the older age groups. The 16-24 age group reported the lowest percentage of adults consuming five or more portions of fruit and vegetables (Figure 31).

FIGURE 31: Adults reporting to be obese by fruit and vegetable consumption*, age-standardised percentage, persons aged 16+ years, Wales, 2016/17

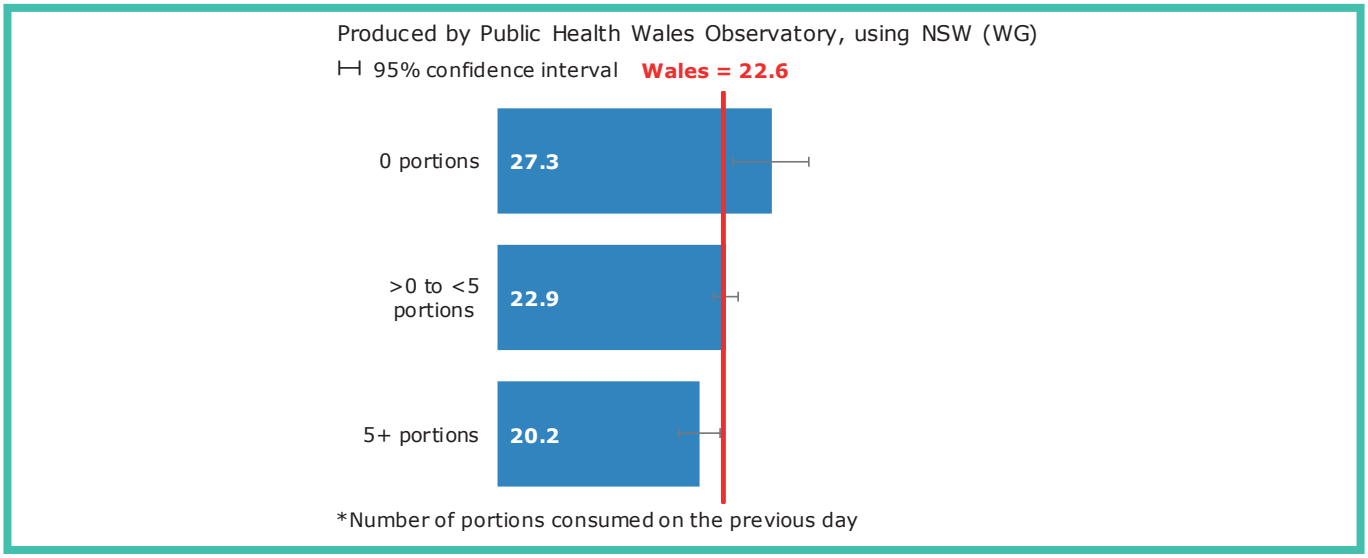
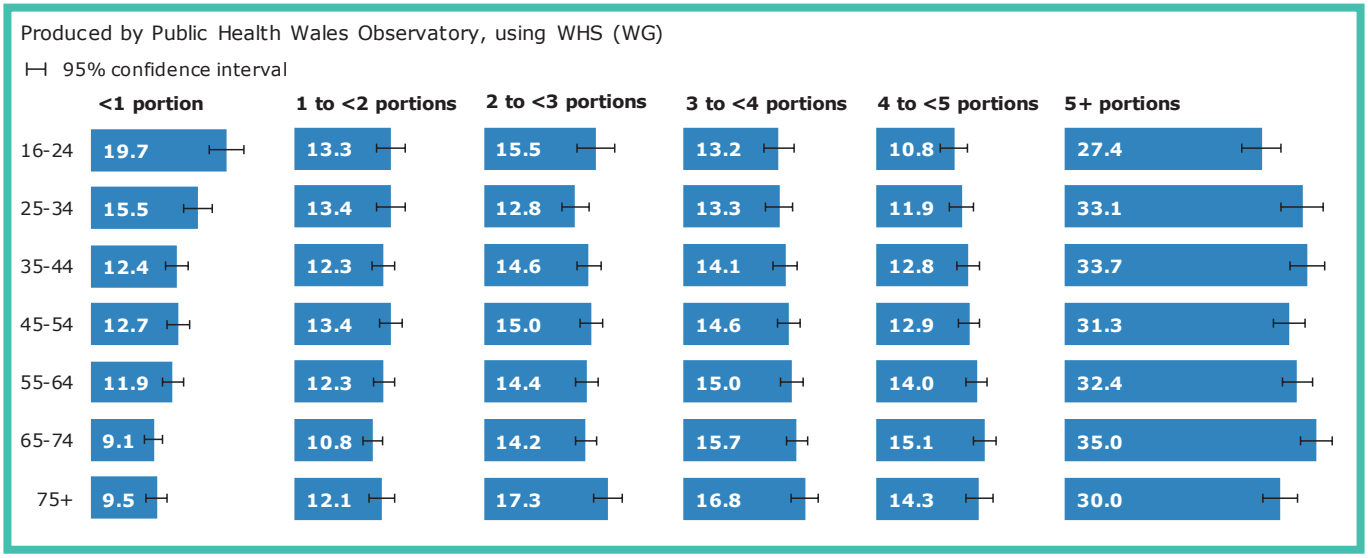
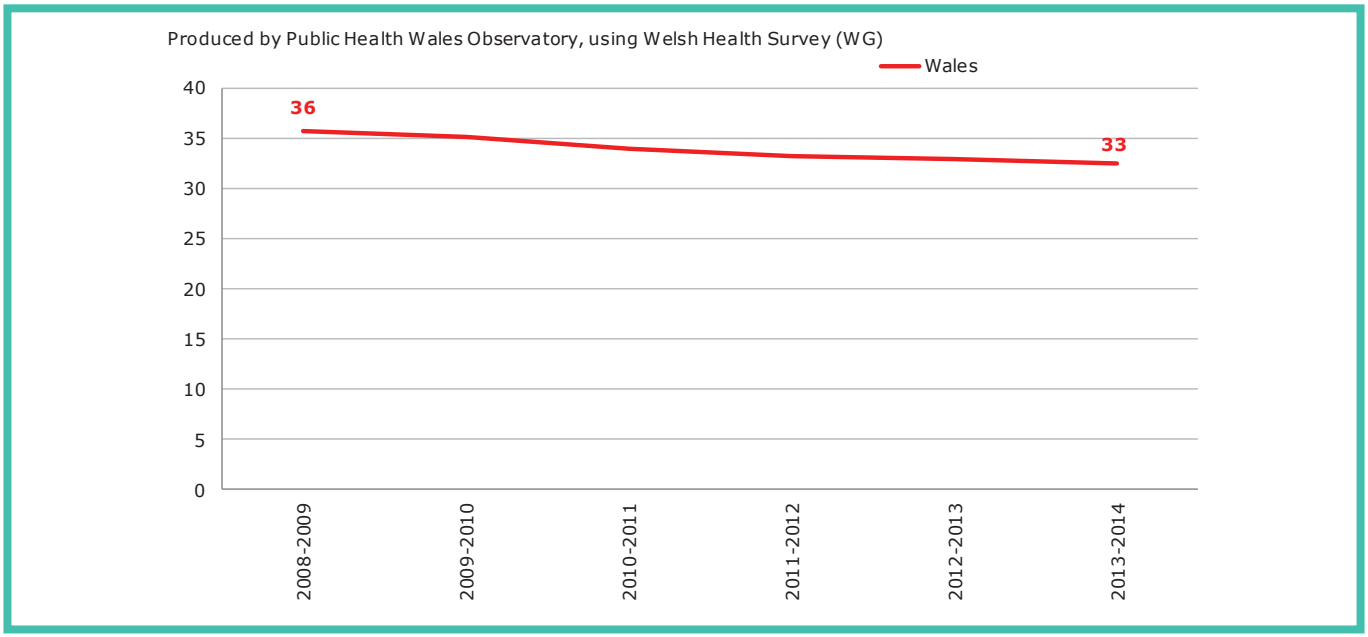


FIGURE 32: Portions of fruit/vegetables consumed the previous day by 10-year age groups, adults aged 16+ years, percentage and 95% confidence intervals, Wales, 2015



Based on data from the WHS, Figure 32 shows that the percentage of the Welsh population consuming the recommended levels of fruit and vegetables is decreasing. There has been a decrease of 3% over the last 5 years in the percentage of adults who consume five portions of fruit and vegetables a day. The Public Health Wales Observatory projected that by 2025, nearly three quarters (74.3%) of the population will not be consuming the recommended levels. Changing this trend should be an area of focus for population health and wellbeing.

FIGURE 33: Percentage of adults reporting eating 5 portions of fruit / vegetables the previous day, age-standardised percentage, persons, Wales, 2008-2014

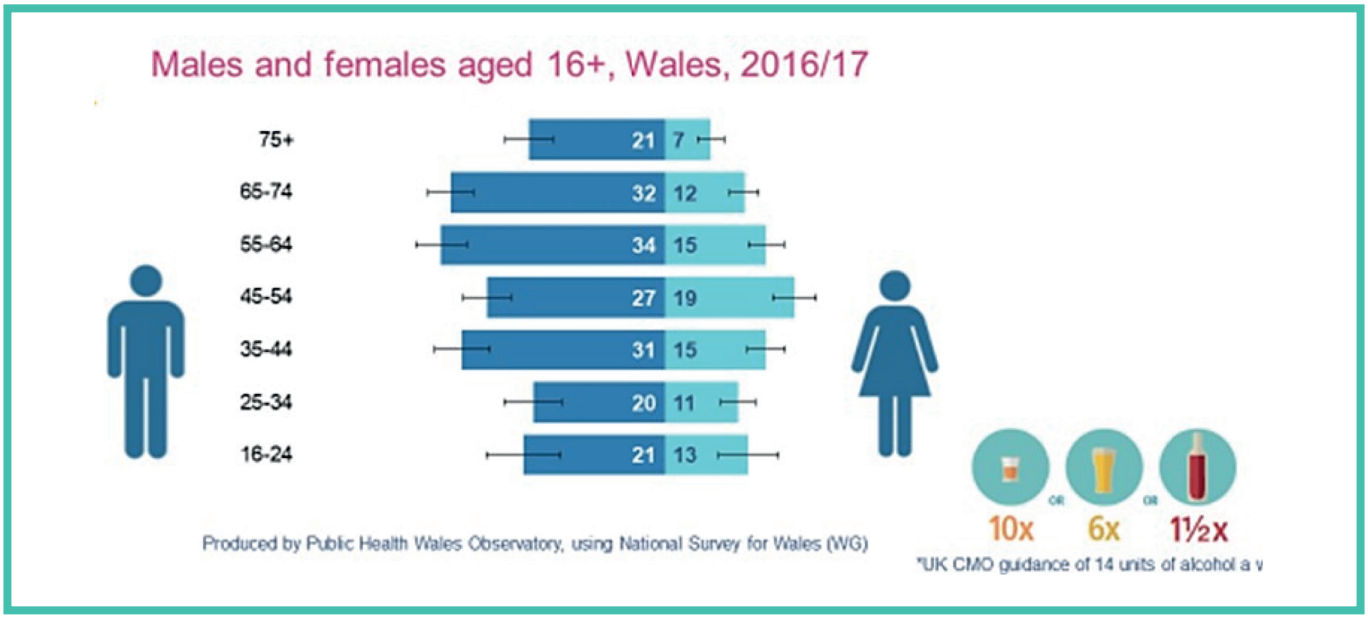


4.1.5 Alcohol consumption

The National Diet and Nutrition Survey found that 58% of men and 45% of women aged 19 to 64 years and 48% of those aged 65 years and over, reported consuming alcohol.

The energy content in 1 gram of alcohol is 29 kJ or 7.1 kcal, so potentially alcohol intake could be a risk factor for obesity in some individuals, however the evidence is conflicting and more studies are needed to determine if there is an association between risk of obesity and levels of alcohol consumption.[37] In Wales, in most age groups, men are more likely to drink above the guidelines compared to women, ranging from 21-32% of men and 7-19% of women. (Figure 34)

FIGURE 34: Percentage of adults who reported drinking above weekly guidelines, by age, Wales, 2016



Source: Welsh Government. National Survey for Wales, 2016.

4.1.6 Out of home eating

One of the most significant changes in our eating patterns in recent decades has been the proportion of food consumed and or prepared outside of the home. Out of home eating includes both place of preparation or place of consumption.

- 'Fast foods' take away foods and home delivery
- Food purchased in workplaces (i.e. work place canteens and restaurants). This can also include canteens and restaurants in higher and further education establishments
- Meals in restaurants/cafes/pub
- It does not include ready meals purchased in grocery stores/supermarkets.

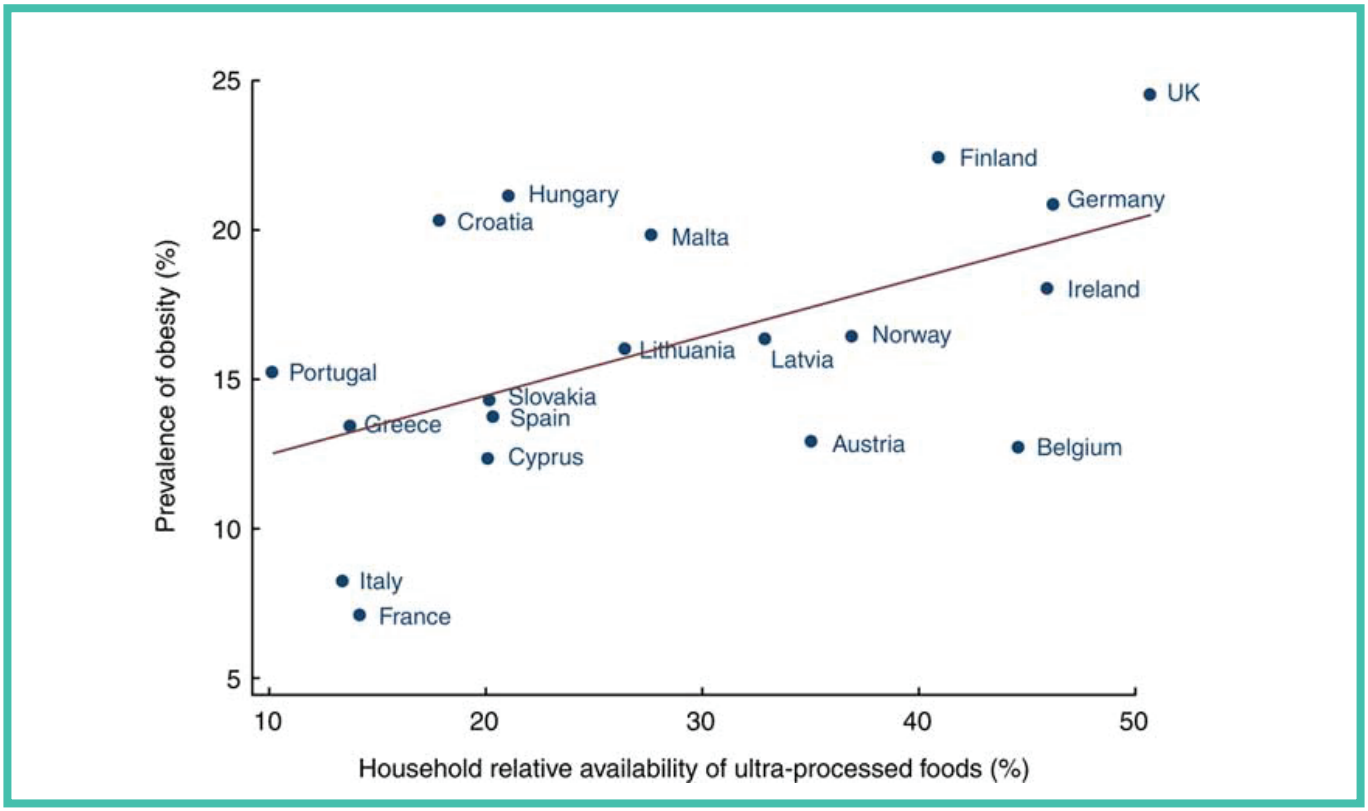
a) Food prepared out of the home

Ultra-processed foods, including pre-prepared meals and snack foods, provide more energy and fewer nutritional benefits than minimally processed foods.[38, 39]

Compared to countries with low prevalence of obesity, countries with a high prevalence e.g.US, Mexico, Australia, New Zealand have adopted a diet based on high consumption of processed foods, high portion sizes, high consumption of food bought or prepared outside of home and use the car as the primary mode of transport in urban areas.[40]

Studies of national diets undertaken in the USA, Canada, Brazil and Chile have consistently shown that, as a group, ultra-processed foods have an obesogenic nutrient profile.[41] These studies showed a wide variation of the contribution of ultra-processed foods to the diet from 10·2% of total purchased dietary energy in Portugal and 13·4% in Italy to 46·2% in Germany and 50·7% in the UK.[42] Studies have demonstrated the relationship between availability of ultra-processed foods and obesity levels and it is argued explain at least in part the differential levels of obesity in different countries (Figure 35).

FIGURE 35: Regression of prevalence of obesity among adults v. household availability of ultra-processed foods (percentage of total energy) in nineteen European Countries (1991 – 2008) (Montiero et al, 2017)[43]

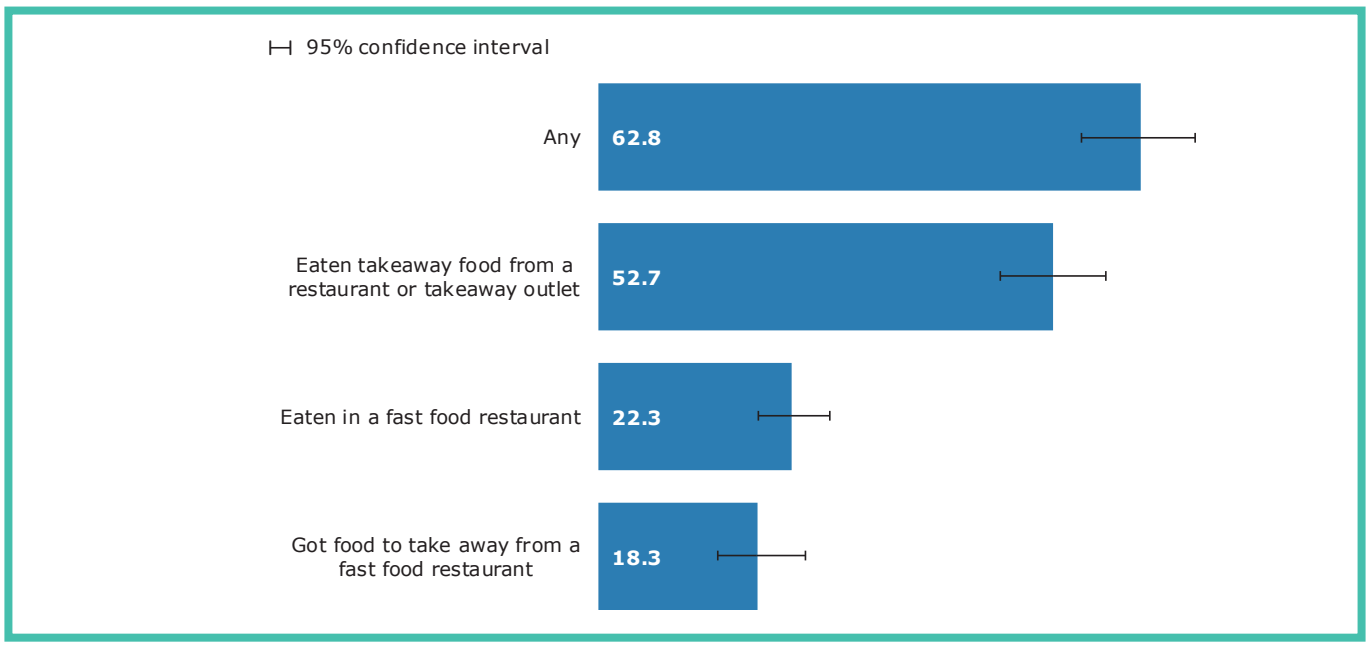


Food and You is a consumer survey which provides evidence of public food safety attitudes, reported behaviour, food safety knowledge and food issues in England, Wales and Northern Ireland conducted by the Food Standards Agency. The results for Wales in 2017 found that:[44]

- Over half of the respondents ate breakfast at home every day.
- 1 in 10 ate breakfast away from home every day.
- 5.1% reported that they never eat breakfast.
- Over 1 in 10 respondents reported that they could not afford to eat balanced meals for some time.
- 1 in 5 respondents had worried that they would run out of food before having enough money to buy more.
- Nearly two-thirds of respondents reported that they prepare food for themselves or others at least once a day.
- Almost 10% prepare food less than once a week

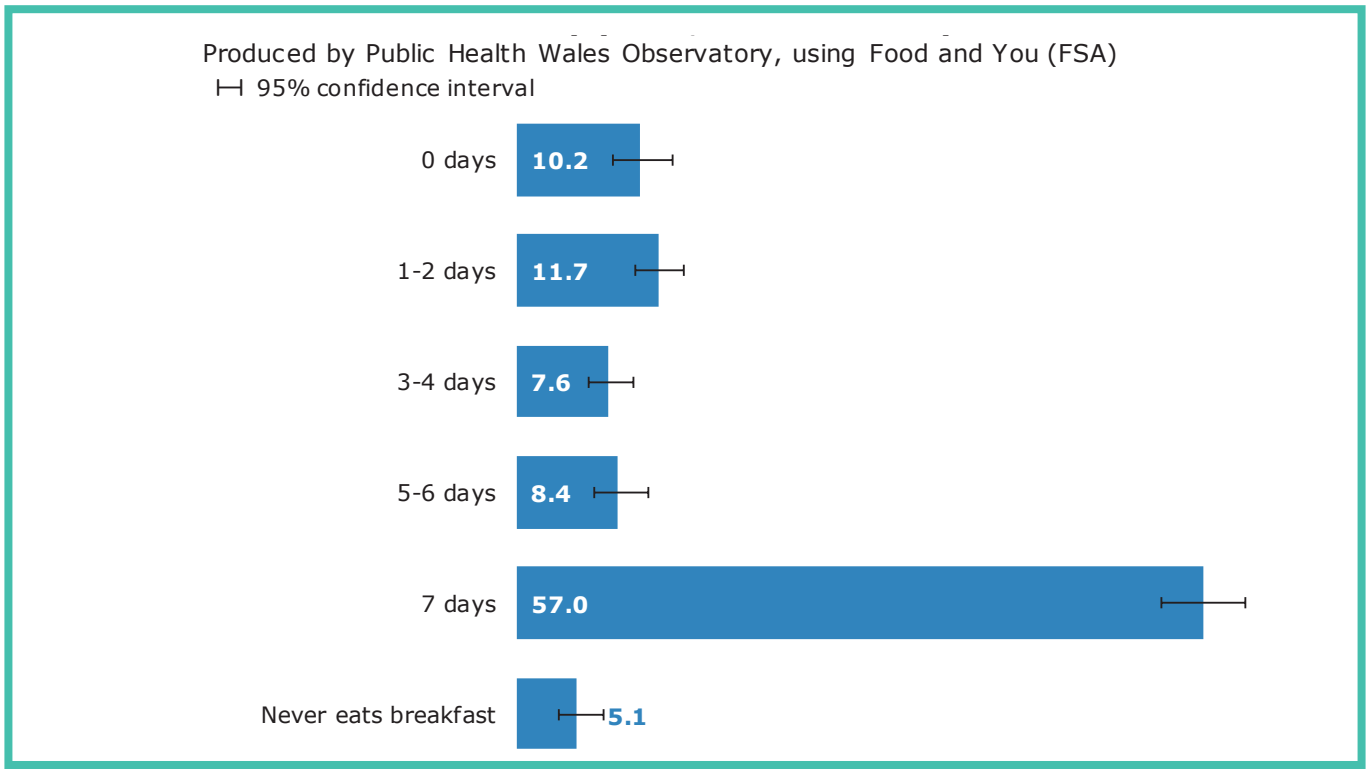
The implications of this are that food preparation in and out of the home is important.

FIGURE 36: Persons who have eaten take away food from a restaurant, takeaway outlet or fast food restaurant in the previous month, percentage, persons aged 16+ years, Wave 4 of the Food and You Survey, Wales, 2016



Having a choice of healthy food to eat when out of home is not considered important when deciding where to eat out. Only 5.3% considered it to be an important choice in their decision making and less than 1% considered nutritional information important when eating out. Nutrition was the least of all the factors considered.

FIGURE 37: Responses to the question, 'Number of times eaten breakfast at home in the last seven days' percentage, persons aged 16+ years, Waves 2 – 4 of Food and You Survey, Wales, 2012, 2014 and 2016

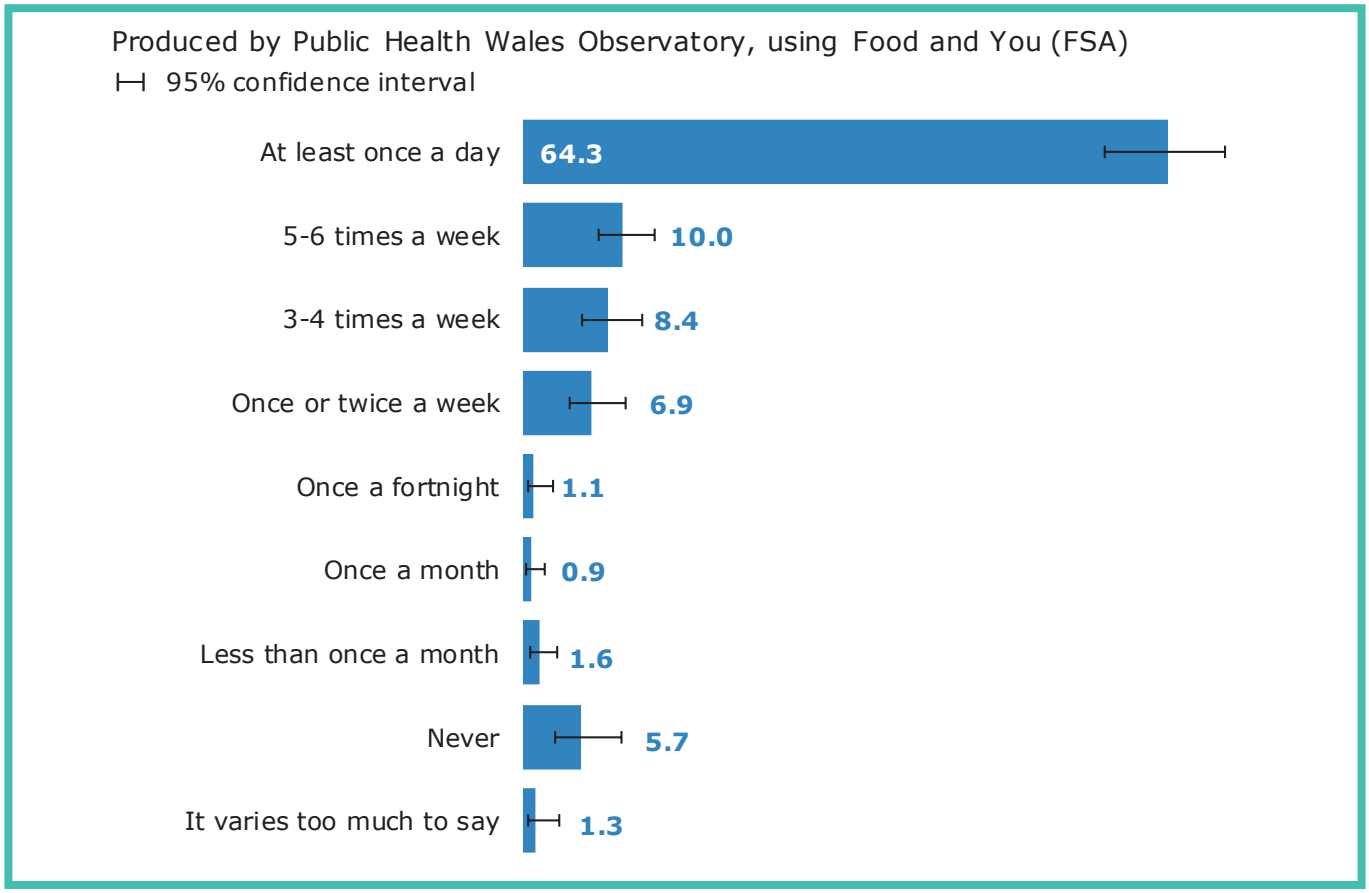


4.1.7 Cooking behaviour

Around a third of people in Wales cook once a day (64.3%), and one in ten never cook. There is an increase of the proportion of hot food being purchased outside the home. This food is more likely to be unhealthy, higher in sugar, fat and salt, and is an important factor to the rising levels of obesity.

The definitions used for 'cooking' need to be carefully considered as many people will consider placing a pre-prepared meal or food product e.g. a Pizza, into the oven and baking it as cooking, others may consider cooking to be preparing a meal from scratch using a range of ingredients.

FIGURE 38: Frequency of cooking or preparing food for yourself or others, percentage persons aged 16+ years, Wave 4 of the Food and You Survey, Wales, 2016



4.2 Physical activity

Physical activity (PA) is defined by the World Health Organisation as any bodily movement produced by skeletal muscles that require energy expenditure.[45] Physical Activity includes all forms of activity, such as everyday walking or cycling to get from place to place, active play, work-related activity, active recreation, dancing, gardening or playing active games, as well as structured exercise and competitive sport.[46] Regular physical activity can reduce the risk of many chronic conditions including coronary heart disease (CHD), stroke, type 2 diabetes, cancer, obesity, mental health problems and musculoskeletal conditions.[47] There is no other single intervention that can treat and prevent more long term conditions and diseases than physical activity.[48] Large scale observational research has also established a clear association between Physical Activity and reduced all-cause mortality[49 50] Table 3 highlights the economic burden of physical inactivity from ill health due to diabetes, cardiovascular disease and coronary heart disease.

TABLE 3: Expenditure attributable to physical inactivity for diabetes,cardiovascular disease and coronary heart disease

Per capita expenditure (£) attributable to physical inactivity for selected health conditions, all persons, Wales and health boards, 2014/15

	Diabetes	Cerebrovascular disease	Coronary Heart Disease	Total
Betsi Cadwaladr University Health Board	3.76	3.65	4.25	11.66
Powys Teaching Health Board	4.77	6.04	4.41	15.22
Hywel Dda University Health Board	4.59	3.16	4.01	11.77
Abertawe Bro Morgannwg University Health Board	4.27	3.58	3.83	11.68
Cardiff and Vale University Health Board	3.82	2.52	3.01	9.35
Cwm Taf University Health Board	4.55	3.61	4.28	12.44
Aneurin Bevan University Health Board	4.08	2.33	3.84	10.26
Wales	**4.14**	**3.25**	**3.89**	**11.28**

Produced by Public Health Wales Observatory using Population Attributable Fractions (Lee et al and Townsend & Foster) and Programme Budget data (StatsWales)

Low levels of physical activity is an important factor in the increasing prevalence of obesity. *Getting Wales Moving* highlights that being inactive is perceived as normal by a large proportion of people in Wales.[51] The report states that the passive attitude towards levels of activity, where movement and exercise is viewed as simply a personal choice is not sustainable in a 21st century Wales and needs a strategic plan for getting Wales active.[52]

Information on the level of physical activity for the population of Wales comes from a range of sources and is all self-reported information.

The Health Behaviour in School-Aged Children provides information of children aged 11 – 16 years of age through a representative sample survey. The National Survey for Wales provides information on physical activity levels for adults and some information on levels of activity for children provided by parents. In addition there are other surveys such as those conducted by Sport Wales e.g. Hooked on Sport.

4.2.1 Physical activity guidelines

The UK Chief Medical Officers' have produced joint guidelines for levels of physical activity in the population by age:[53]

The recommended levels of physical activity have a beneficial impact on cardiovascular health, chronic ill health and health and wellbeing and not necessarily on clinically significant weight loss.[54]

Joint Chief Medical Officers' Physical Activity Guidelines

Children aged under 5 years

- PA should be encouraged from birth, particularly through floor-based play and water-based activities in safe environments.
- Children of pre-school age who are capable of walking unaided should be physically active daily for at least **180 minutes** (3 hours), spread throughout the day.
- All under 5s should minimise the amount of time spent being sedentary (being restrained or sitting) for extended periods (except time spent sleeping).

Children aged 5-18 years

- at least **60 minutes** of physical activity every day – this should range from moderate activity, such as cycling and playground activities, to vigorous activity, such as running and tennis
- On 3 days a week, these activities should involve exercises for strong muscles and bones, such as swinging on playground equipment, hopping and skipping, and sports such as gymnastics or tennis
- Children and young people should also reduce the time they spend sitting for extended periods of time, including watching TV, playing computer games and travelling by car when they could walk or cycle.

Adults aged 19 – 64 years

- Over a week, activity should add up to at least **150 minutes** (2½ hours) of moderate intensity activity in bouts of 10 minutes or more – one way to approach this is to do 30 minutes on at least 5 days a week.
- Alternatively, comparable benefits can be achieved through 75 minutes of vigorous intensity activity spread across the week or combinations of moderate and vigorous intensity activity.
- Adults should also undertake Physical Activity to improve muscle strength on at least two days a week.
- All adults should minimise the amount of time spent being sedentary (sitting) for extended periods.

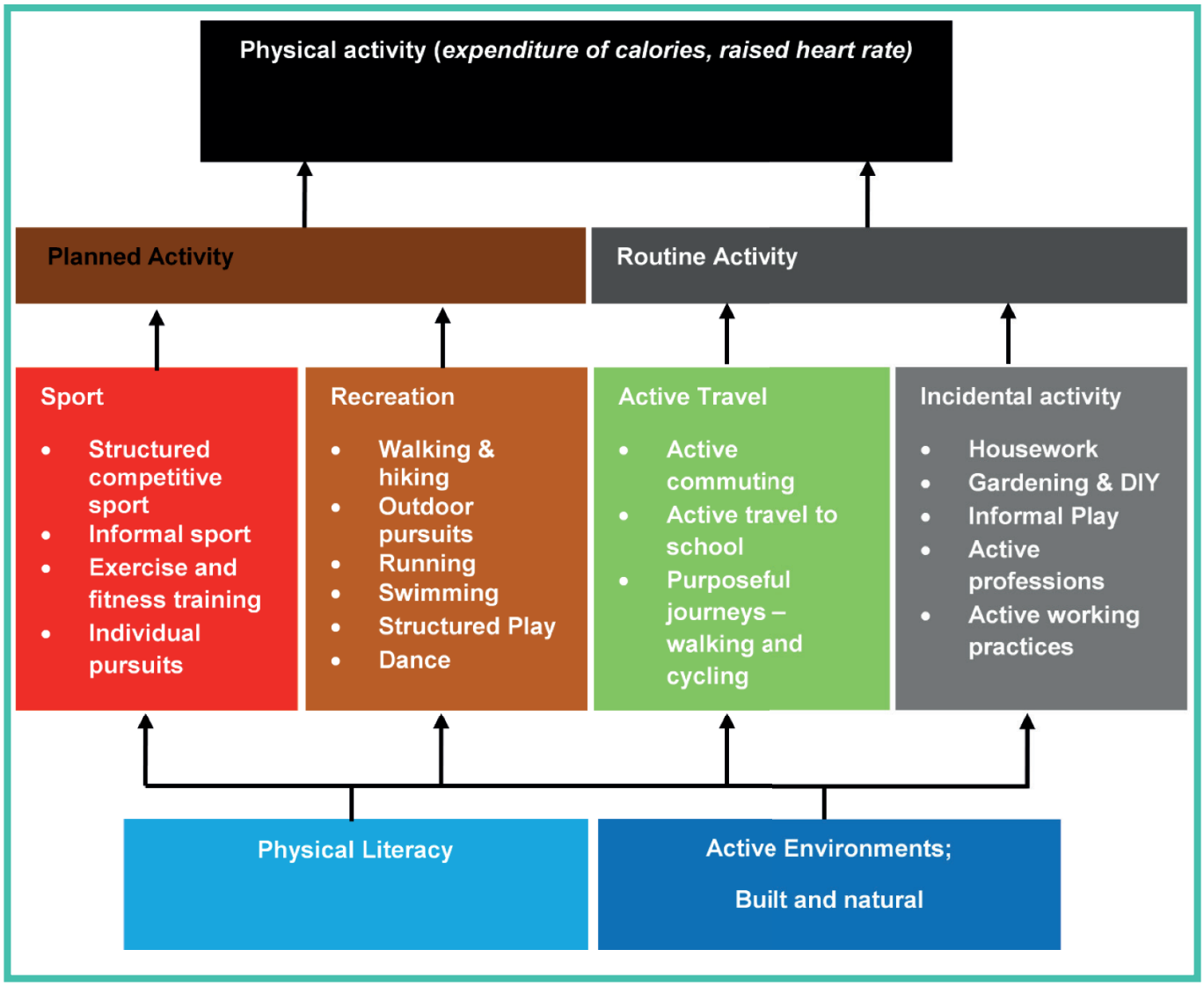
Older adults aged 65 years

- At least **150 minutes** of moderate aerobic activity such as cycling or walking every week OR **75 minutes** of vigorous aerobic activity such as running or a game of singles tennis every week OR a mix of moderate and vigorous aerobic activity every week (for example, two 30-minute runs plus 30 minutes of brisk walking equates to 150 minutes of moderate aerobic activity)
- Strength exercises on 2 or more days a week that work all the major muscles (legs, hips, back, abdomen, chest, shoulders and arms)

4.2.2 Components of physical activity

An individual's physical activity is made up of a range of different contributions, some planned, such as participation in sport or active recreation and others as part of day to day life such as walking to work or school. Ultimately being active means sitting less and moving more.

FIGURE 39: Components of physical activity



4.3 Levels of Physical activity in Wales

4.3.1 Children aged 0-5 years

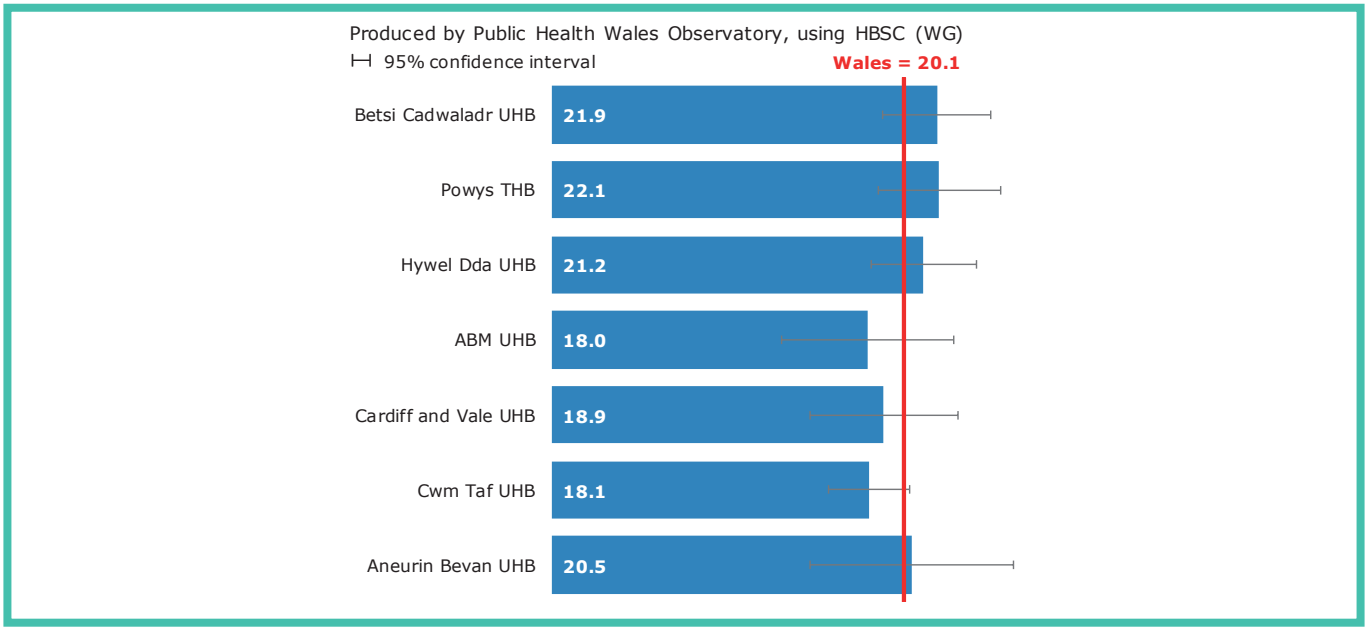
There is currently no routinely available information on levels of physical activity for 0-5 year olds. The National Survey contains some parent reported data but this is on a relatively small sample. The findings of the survey for 2016/17 indicate that among children aged 3 – 5 years 93% had at least one hour of screen time on a normal weekday and 97% on a normal weekend.

A total of 9% of 3 – 7 years olds are not active for one hour or more on any days of the week; 29% are active for one hour or more on one to six days a week and 62% are active for one hour or more every day.

4.3.2 Children aged 11-16 years

Overall in Wales, less than 1 in 5 children aged 11-16 years (15%) met the CMO guidelines for engaging in at least 60 minutes and up to several hours of moderate or vigorous physical activity, every day. More teenage boys (20.1%) than girls (10.7%) met these physical activity guidelines. (2013/14)

FIGURE 40: Percentage of young people aged 11–16 years reporting at least 60 minutes of physical activity per day, by Health Board, Wales, 2013/14



Source: Public Health Wales Observatory

Physical activity habits, and, specifically, inactivity, track significantly from adolescence into young adulthood and so levels of physical activity in children aged 11-16 years in Wales needs to increase from the current low baseline

On average, physical activity levels in girls are lower compared to boys, with around 1 in 10 adolescent girls (10.7%), achieving physical activity targets compared to 1 in 5 boys (20.1%). (The percentage who were physically active every day (for at least 60 minutes)).

Figures 41 and 42 show the health board with the highest percentage of boys aged 11-16 achieving 60 minutes of physical activity on 7 days in the previous week is Powys (22.1%) and for girls is Cwm Taf University Health Board (12.8%). It is interesting that Cwm Taf has the highest rate of physically active adolescent females. The health board with the lowest percentage of teenagers aged 11-16 years achieving 7 days of 60 minutes physical activity is Abertawe Bro Morgannwg University Health Board (18.0% for boys and 9.1% for girls).

FIGURE 41: Percentage of girls aged 11-16 years who were physically active every day (for at least 60 minutes each day) in the past week 2013/14

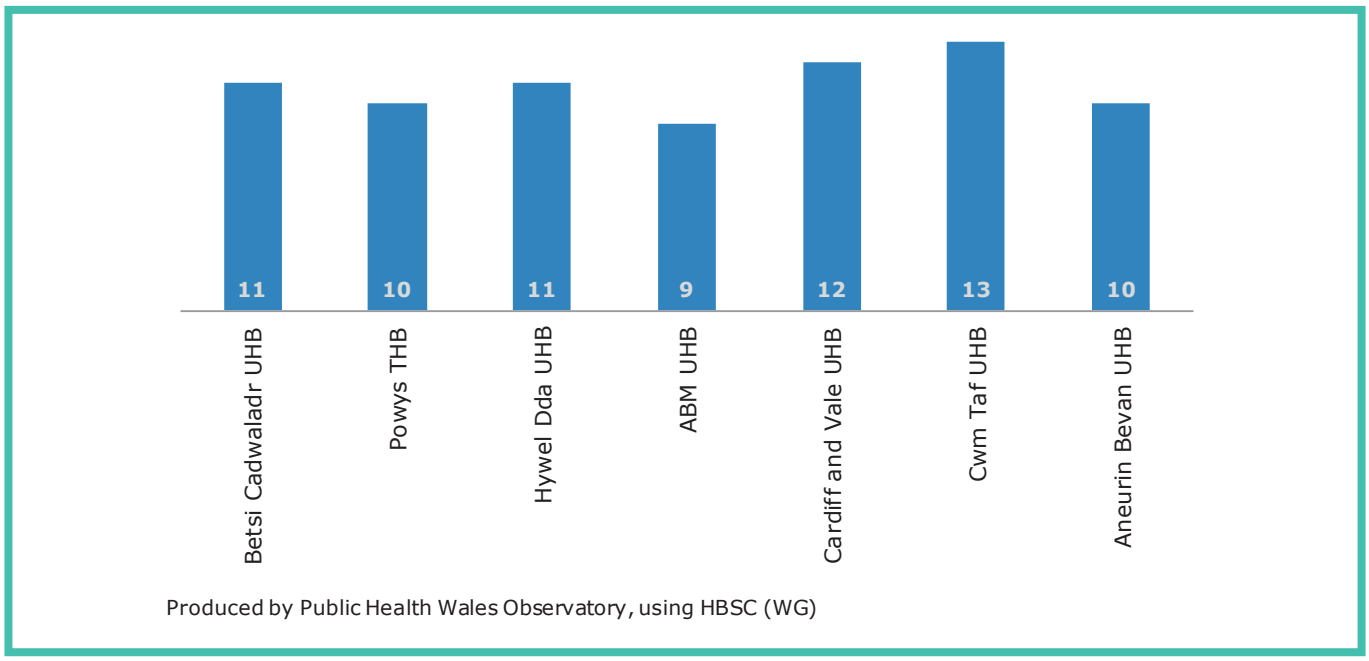
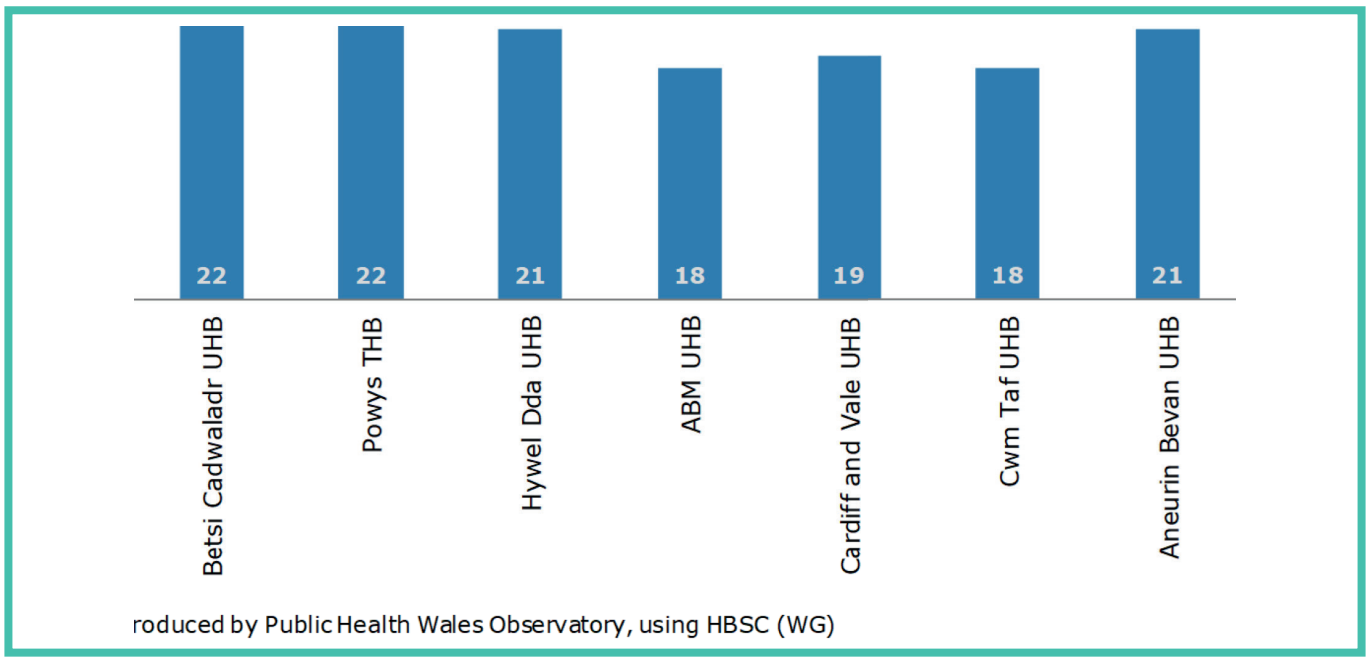


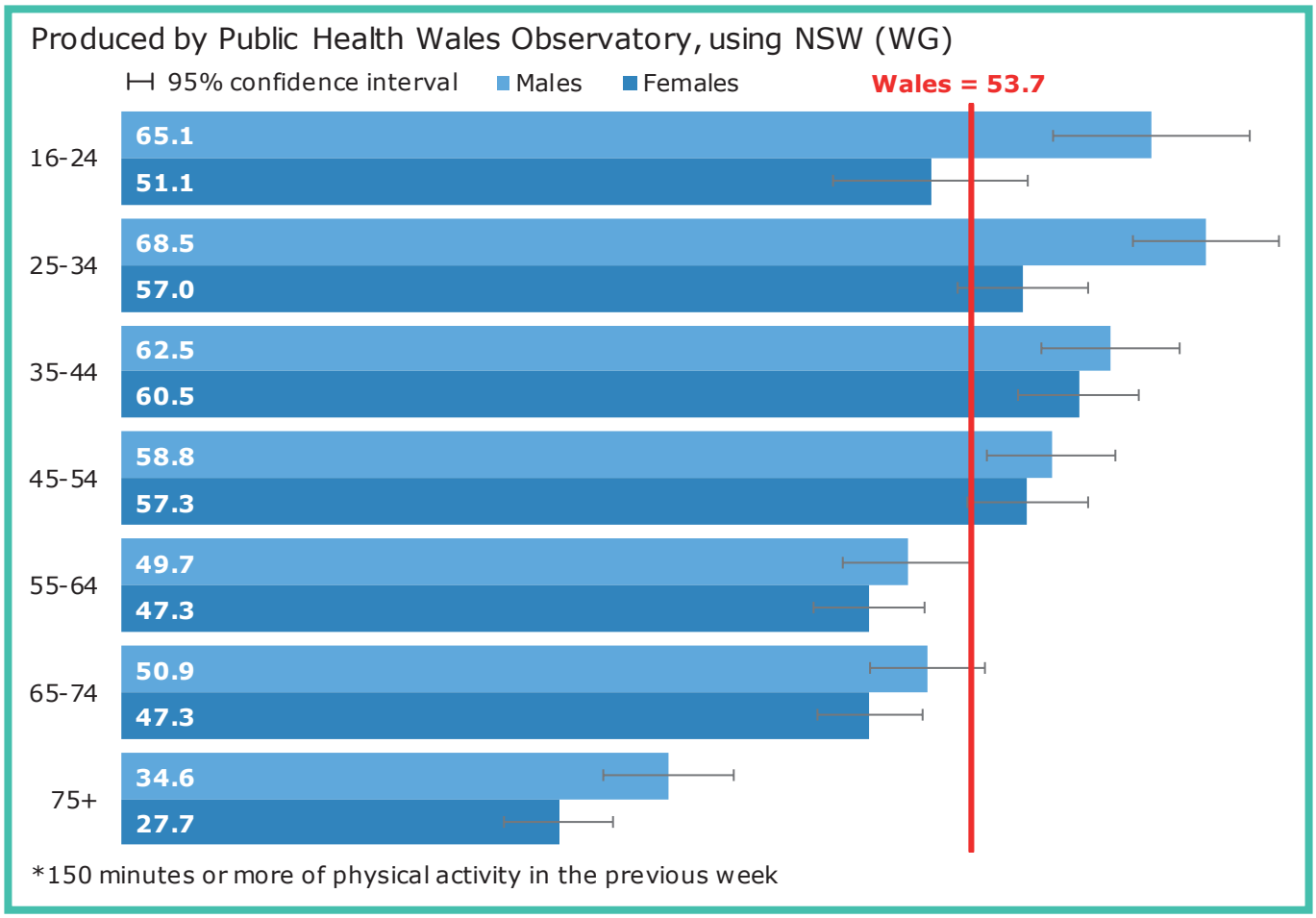
FIGURE 42: Percentage of boys aged 11-16 years who were physically active every day (for at least 60 minutes each day) in the past week 2013/14



4.3.3 Physical activity in adults aged 16+ years

At present (2017), 54% of adults in Wales report doing enough exercise based on the new guidelines of achieving 150 minutes of moderate or vigorous exercise a week.[56] However, there are low levels of physical activity; with around a quarter of the 16-54 adult population being inactive (defined as less than 30 minutes of physical activity in the previous week). This increases to around a third being inactive in the 55-74 age group and increases even more, to half of people aged 75+ being inactive.

FIGURE 43: Adults reporting to meet physical activity guidelines* by age and sex, percentage persons aged 16+ years, Wales, 2016/17

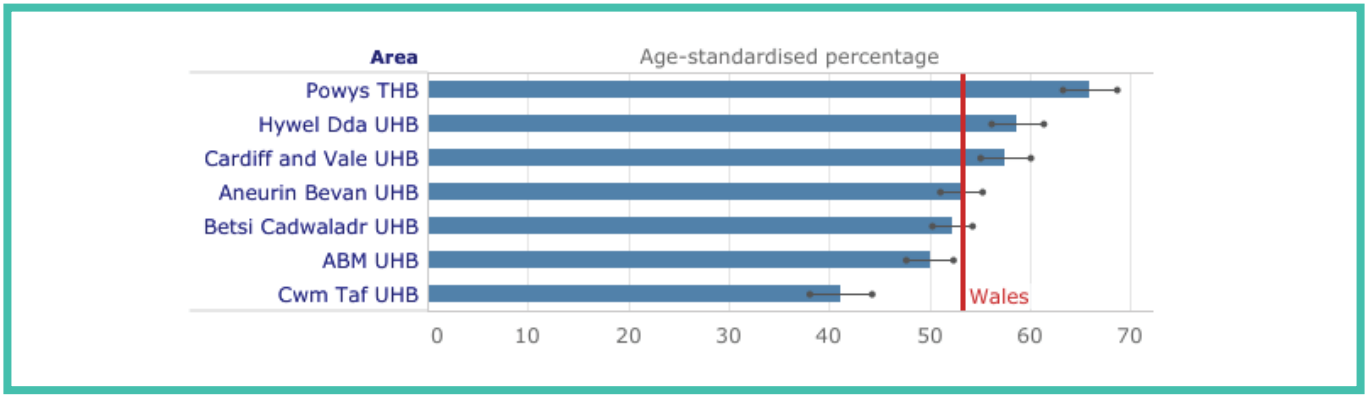


Wales average 54%

More men than women report meeting physical activity guidelines in each age group but the difference is only statistically significant in the 16-34 age groups (Figure 43).

Figure 44 shows that the proportion of adults having recommended levels of physical activity is lowest in Cwm Taf and Betsi Cadwaladr. Cwm Taf has statistically higher adult obesity levels than the Wales average and the lowest adult physical activity rates.

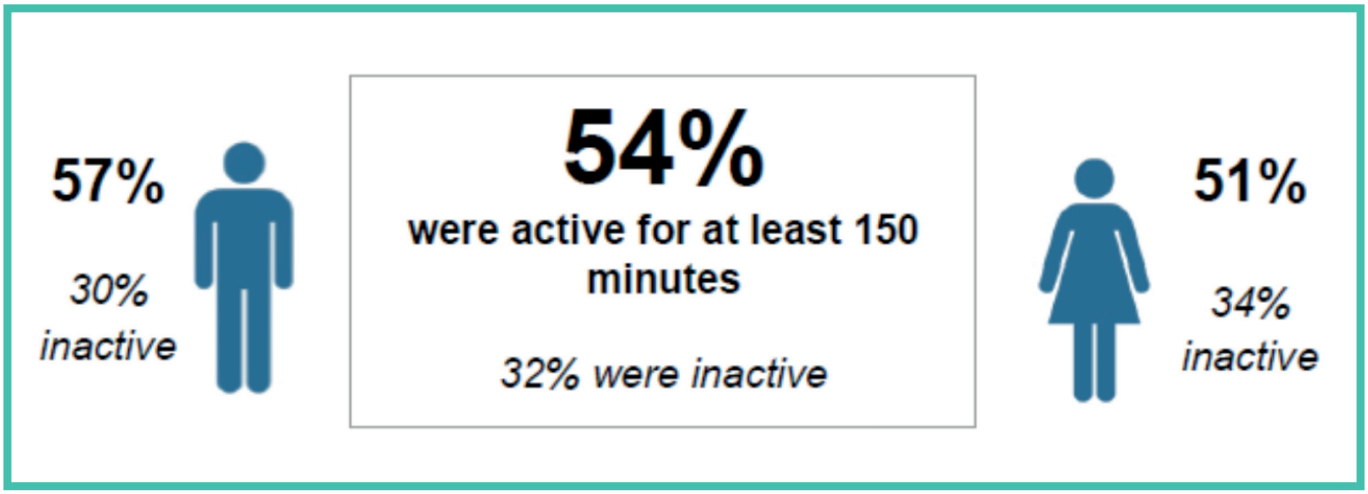
FIGURE 44: Adults reporting to meet physical activity guidelines*, age standardised percentage, persons aged 16+ years, Wales and Health Boards, 2016/17



Source: Public Health Wales Observatory Welsh Government. National Survey for Wales, 2016-17

In Wales, 54% of adults aged 16+ report being active, with a greater proportion of men than women meeting the recommended levels of physical activity.

FIGURE 45: Physical activity in adults, Wales, 2016/17

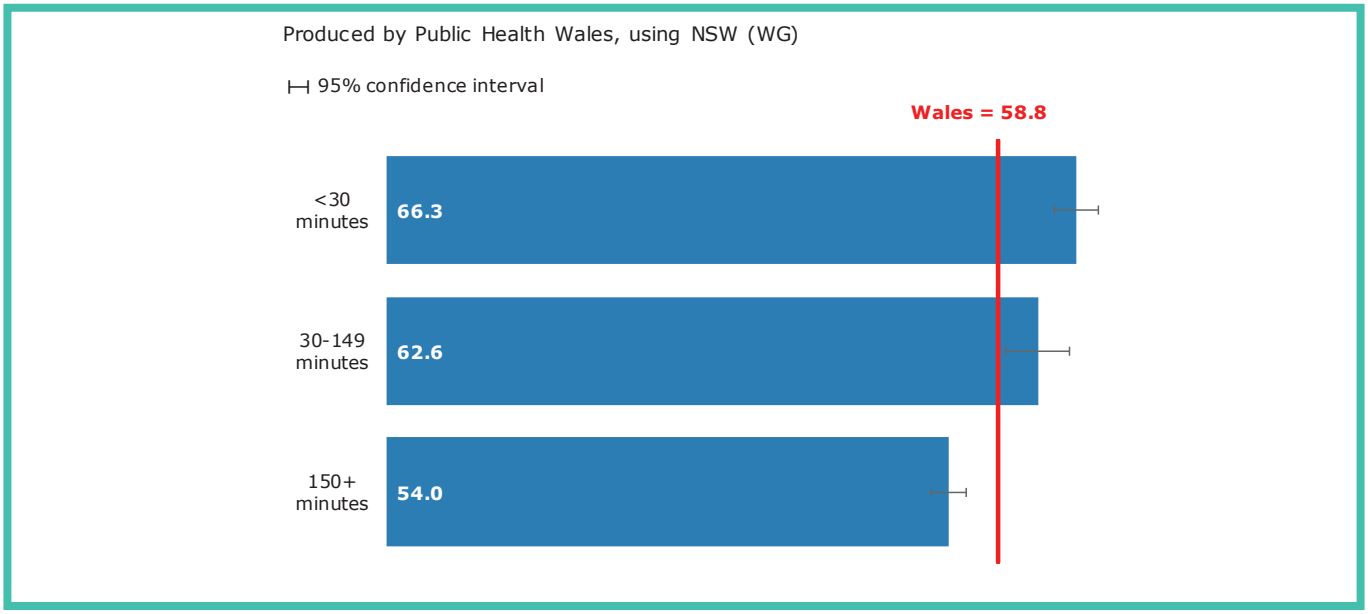


Source: National Survey for Wales, 2016-17.

When levels of being physically active were examined in people classified as being obese, a significantly higher percentage of adults who reported being physically inactive were obese. A significantly lower percentage of adults that reported meeting physical activity guidelines were overweight or obese. (Figure 45). There is approximately a 10% difference between these proportions.

Around 59% of people classified as obese and overweight do the recommended levels of physical activity. The following recommended levels of physical activity is not enough to induce clinically significant weight loss without dietary modification and is unlikely to occur unless the overall volume of physical activity undertaken is above the current minimum guidelines.[57]

FIGURE 46: Adults reporting to be overweight or obese by minutes of moderate physical activity, age standardised percentage, persons aged 16+ years, Wales, 2016/17



When considering the role of physical activity in tackling obesity:

- Maintaining high levels of physical activity can significantly prevent initial weight gain and help maintain a healthy weight[61]
- Eliciting clinically significant weight loss via physical activity alone without dietary modification is possible but unlikely to occur unless the overall volume of physical activity undertaken is above the current minimum guidelines.[61]
- Physical activity can play a major role in the maintenance of weight after initial weight loss or mitigating weight regain.[58,59]

It is important to note though, that physical activity alone offers substantial mental and physical health benefits even when weight gain prevention, weight loss, or weight maintenance is not achieved.

5

Wider Determinants

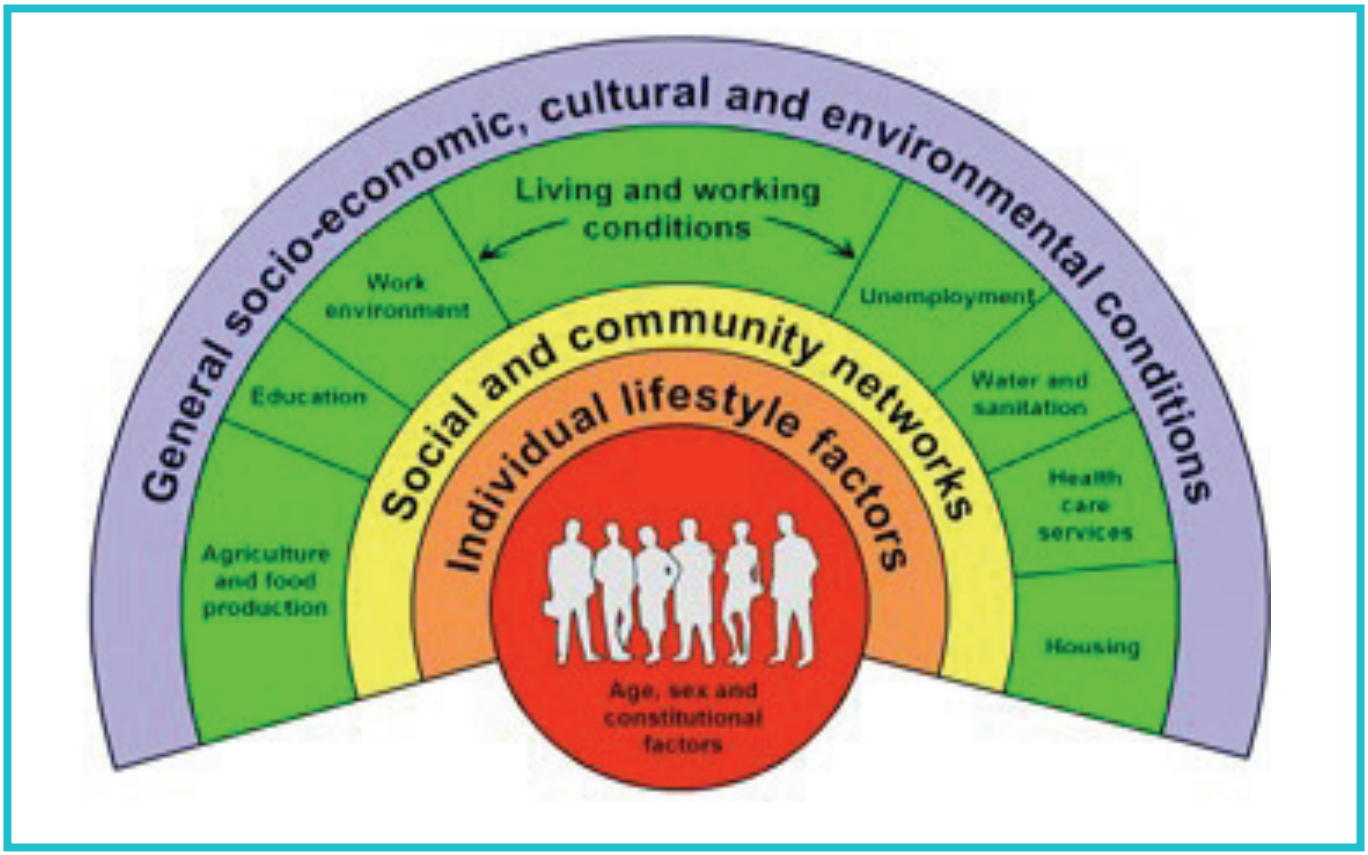
5

Wider Determinants

The wider determinants form part of a broader system of impacts on health, from the individual to the global level.

Overweight and obesity is multifactorial and complex, the causes and impact encompass the wider social determinants e.g. deprivation, education, social networks, adverse incidents in childhood, environment etc. (Figure 47.)

FIGURE 47: Dahlgren and Whitehead's model of the social determinants of health



Source: J Epidemiol Community Health 2010;64:284e291. doi:10.1136/jech.2008.082743

5.1 Deprivation

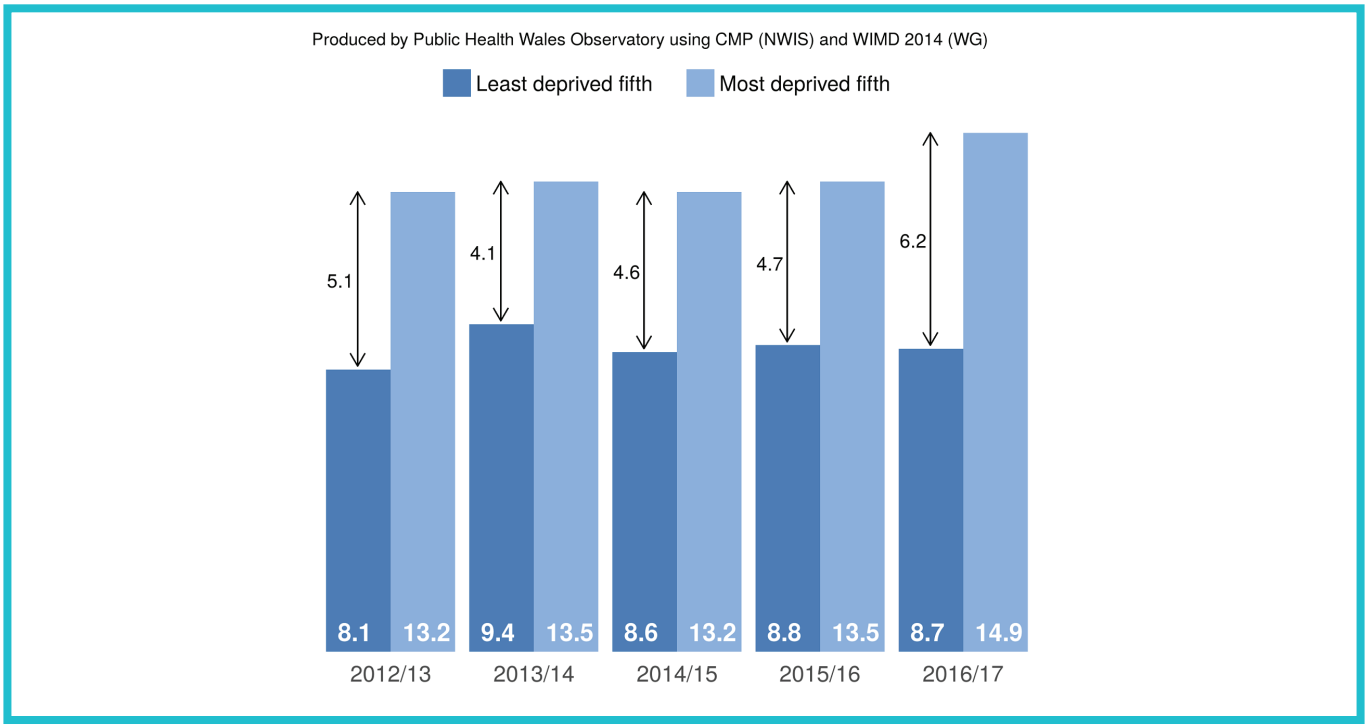
The link between deprivation and obesity has been well described. Several of the elements that make up the Welsh Index of Multiple Deprivation (WIMD), such as employment and educational attainment, have been individually linked to obesity.

5.1.1 Children aged 4-5 years

There is a 6.2 percentage point difference between the prevalence of obesity in children living in the least deprived quintile compared to children living in the most deprived quintile in Wales and there is evidence that this gap is growing (Figure 48)

The local authority area with the highest prevalence of obesity is Merthyr Tydfil where 17.5% of children are classified as obese. This is more than double that of the local authority area with the lowest prevalence; the Vale of Glamorgan, at 7.8%. The Wales obesity prevalence is 12.4%

FIGURE 48: Percentage of children aged 4-5 years who are obese, most and least deprived fifth in Wales, Child Measurement Programme for Wales, 2012/13 – 2016/17



Five year aggregated child measurement programme data, 2012/13 to 2016/17, shows a statistically significantly higher childhood obesity prevalence in seven local authorities:

- Gwynedd – 12.9%
- Pembrokeshire – 12.8%
- Carmarthenshire – 12.8%
- Rhondda Cynon Taf – 13.3%
- Merthyr Tydfil – 16.6%
- Caerphilly – 12.8%
- Blaenau Gwent – 13.9%

5.1.2 Adults aged 16 + years

The percentage of adults who are a healthy weight in Wales decreases as deprivation increases (Figure 49). The proportion of persons who are a healthy weight that live in the most deprived areas (36%) is significantly lower than the Wales average (39.5%), and lower than those who live in the least deprived areas (45.1%) while the more deprived areas have higher rates of adults classified as overweight and obese.

The difference between the least and most deprived fifths has increased over time widening the gap from 6.9% in 2008 to 9.2% in 2015 (Figure 50).

FIGURE 49: Weight categories by deprivation fifths, percentage, persons aged 16+ years, Wales by deprivation fifth, 2015

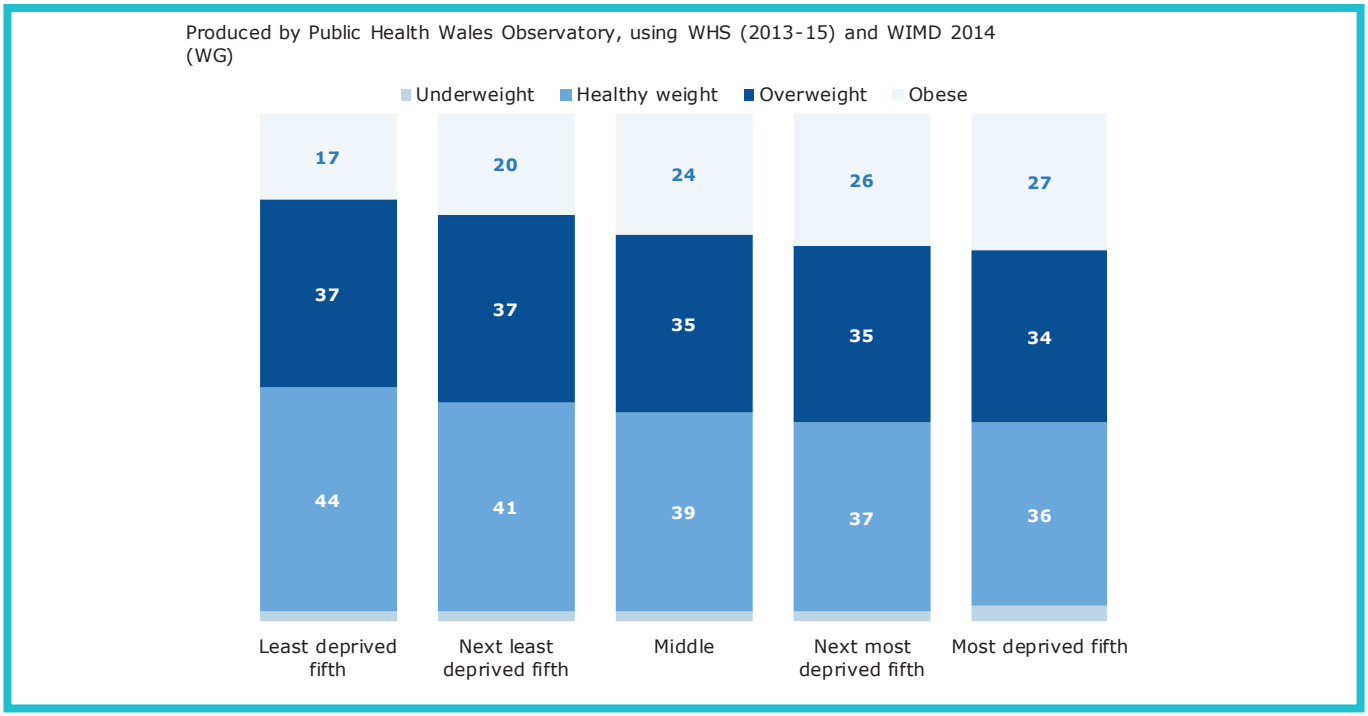
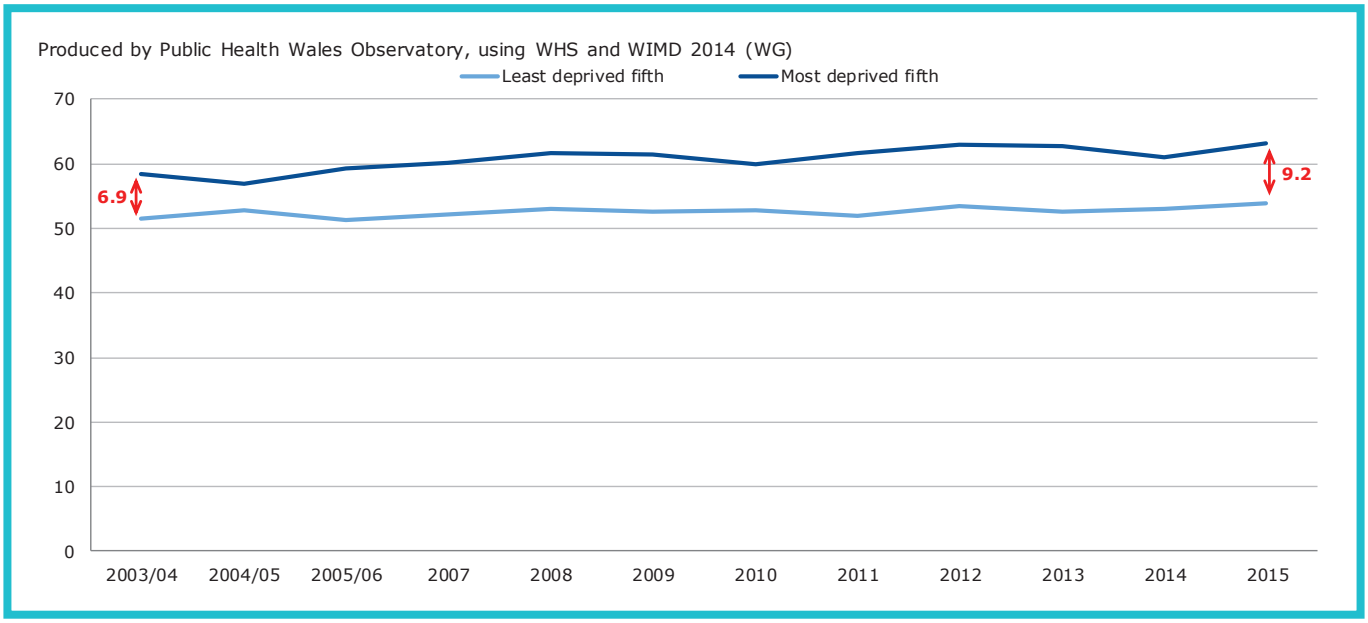


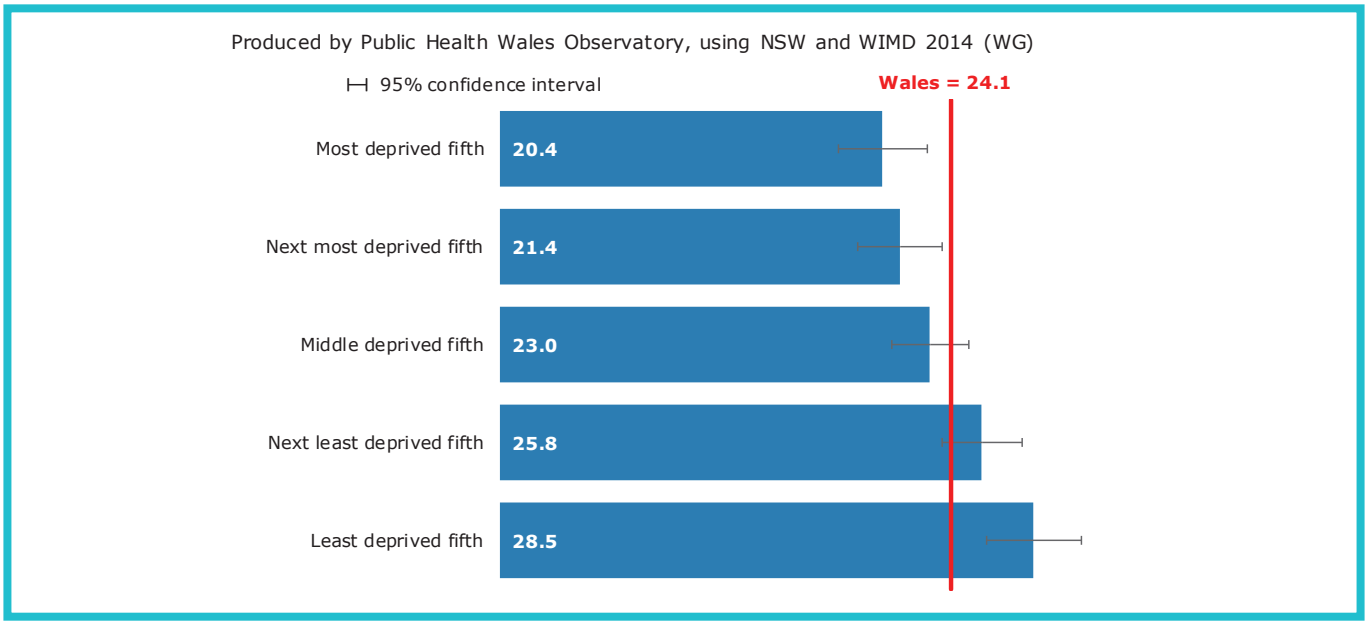
FIGURE 50: Adults who were overweight or obese, age-standardised percentage, all persons aged 16+ years, Wales by deprivation fifth, 2008-2015



5.1.3 Food and vegetable consumption

In Wales fruit and vegetable consumption in more disadvantaged groups is less than the national average. Around 20% of adults in the most disadvantaged areas in Wales eat the recommended number of portions of fruit and vegetables a day, significantly lower than the Wales average.

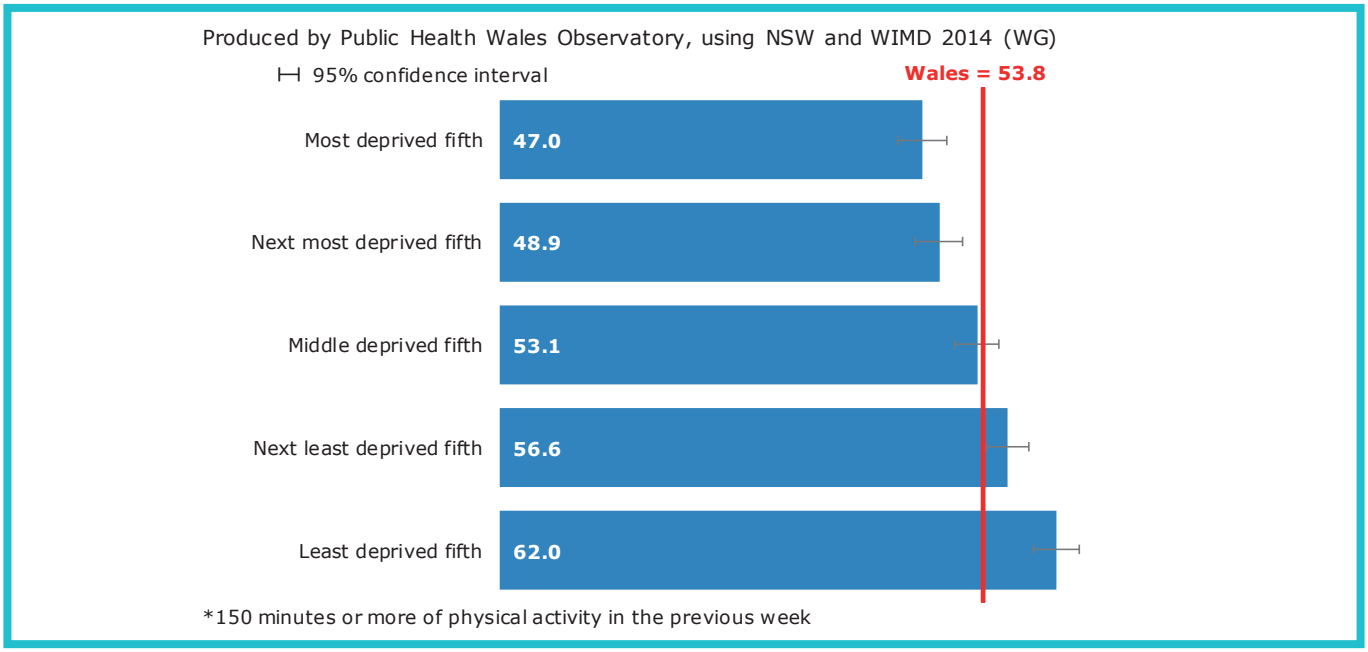
FIGURE 51: Adults eating five fruit or vegetable portions a day by deprivation fifth, age-standardised percentage, persons aged 16+ years, Wales, 2016/17



5.1.4 Physical activity

In Wales, there is a 15 percentage point inequality gap in adults reporting to meet recommended physical activity levels, between the least and most deprived areas. The levels of physical activity decrease as deprivation increases (Figure 52).

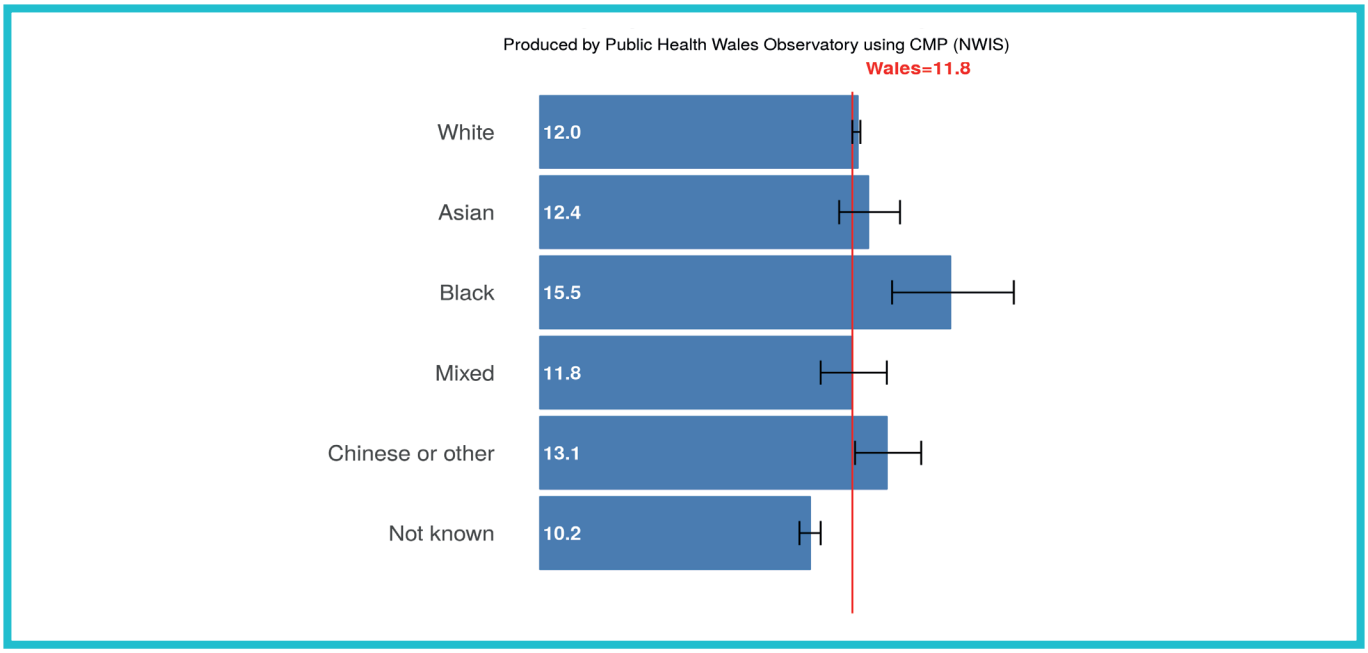
FIGURE 52: Adults reporting to meet physical activity guidelines* by deprivation age-standardised percentage, persons aged 16+ years, Wales, 2016/17



5.2 Ethnicity

An examination by ethnic breakdown did not show a significant difference in childhood obesity between the ethnic groups year on year due to small numbers, however when the data was pooled the children classified as obese in Black ethnic group (15.5%) and Chinese ethnic group (13.1%) were significantly higher than the Wales average (11.8%) (Figure 53).

FIGURE 53: Percentage of children aged 4-5 years classified as obese, by ethnic group, Wales, pooled data 2012/13 to 2016/17



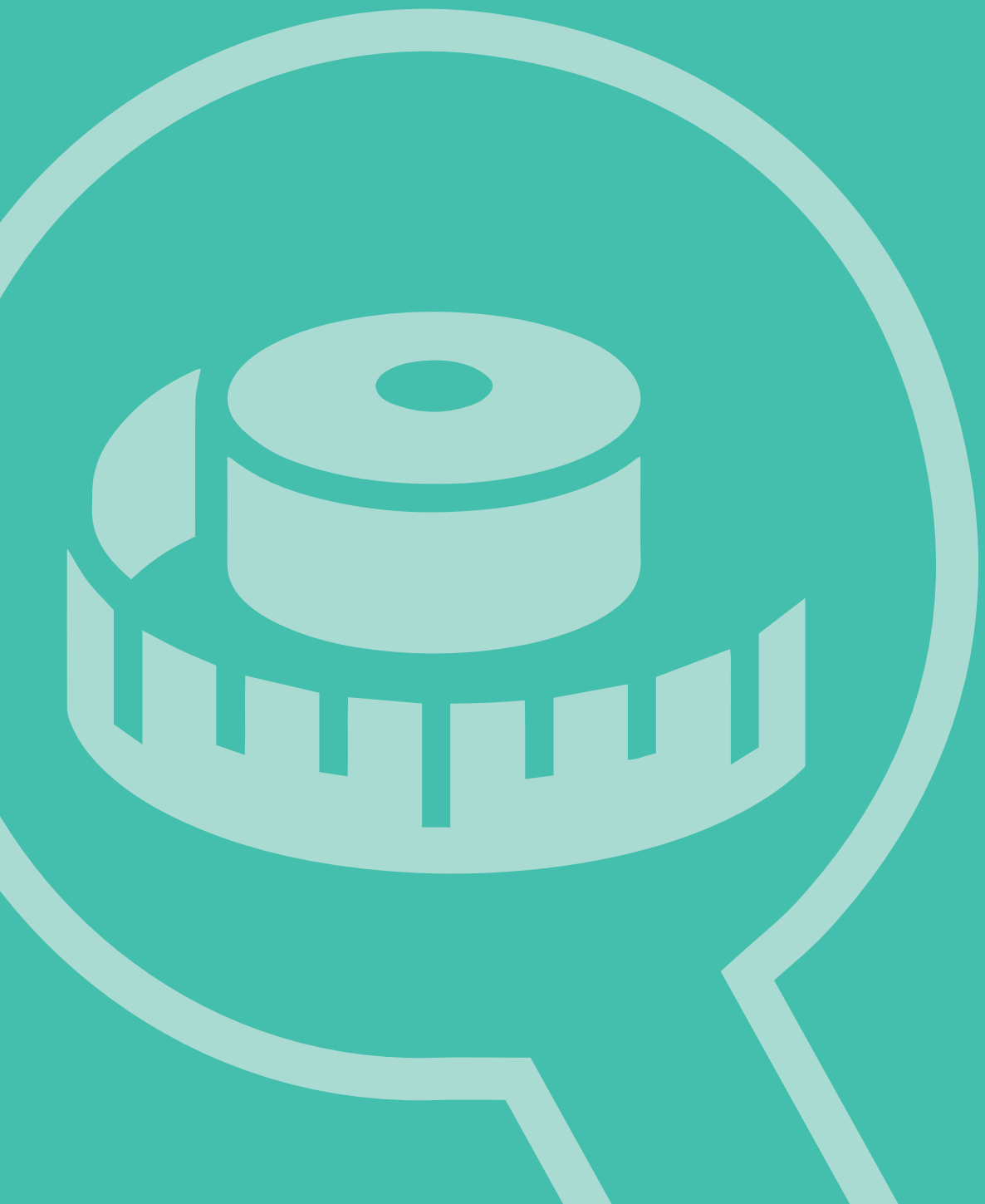
5.3 Adverse childhood experiences

Studies have demonstrated a relationship between adverse childhood experiences (ACEs) and adult obesity. Persons who had experienced four or more categories of childhood exposure, compared to those who had experienced none, had 1.4 - to 1.6 fold increase in physical inactivity and obesity.[62]

A study in Wales found that for every 100 adults in Wales, 50 had at least one ACE and 14 had four or more.[63] Weight reduction interventions may benefit from assessment of ACEs and inclusion of components that address potentially existing psychological trauma, which may interfere with achieving weight loss or maintaining this reduction overtime.

6

Obesity Management



6

Obesity Management

Most of the drivers previously mentioned can be improved by prevention. The distinction between prevention and treatment of obesity is important.

While a focus on prevention is in-keeping with Wales policy commitments and legislation i.e. Wellbeing of Future Generations Act, the numbers of people in Wales who are already obese necessitates the availability of effective evidence based treatment services.

6.1 All Wales obesity pathway

Currently preventing and reducing obesity prevalence in Wales is implemented through the All Wales obesity pathway (2010). Change sentence to: The obesity pathway is made up of four tiers of service provisions. This ranges from self- help and community based services, primary care based services, to specialist and multi services and surgical interventions.

Work has already commenced to review the obesity pathway and to establish a range of minimum standards and a common data set which will enable the outcomes from services to be more clearly demonstrated.

It is acknowledged that all areas of Wales do not currently have access to a range of services at each level of the pathway for adults and children.

6.2 Treatment

Modest weight loss (by 5–10% of initial weight) reduces the risk of developing type 2 diabetes, improves blood pressure and reduces total cholesterol.

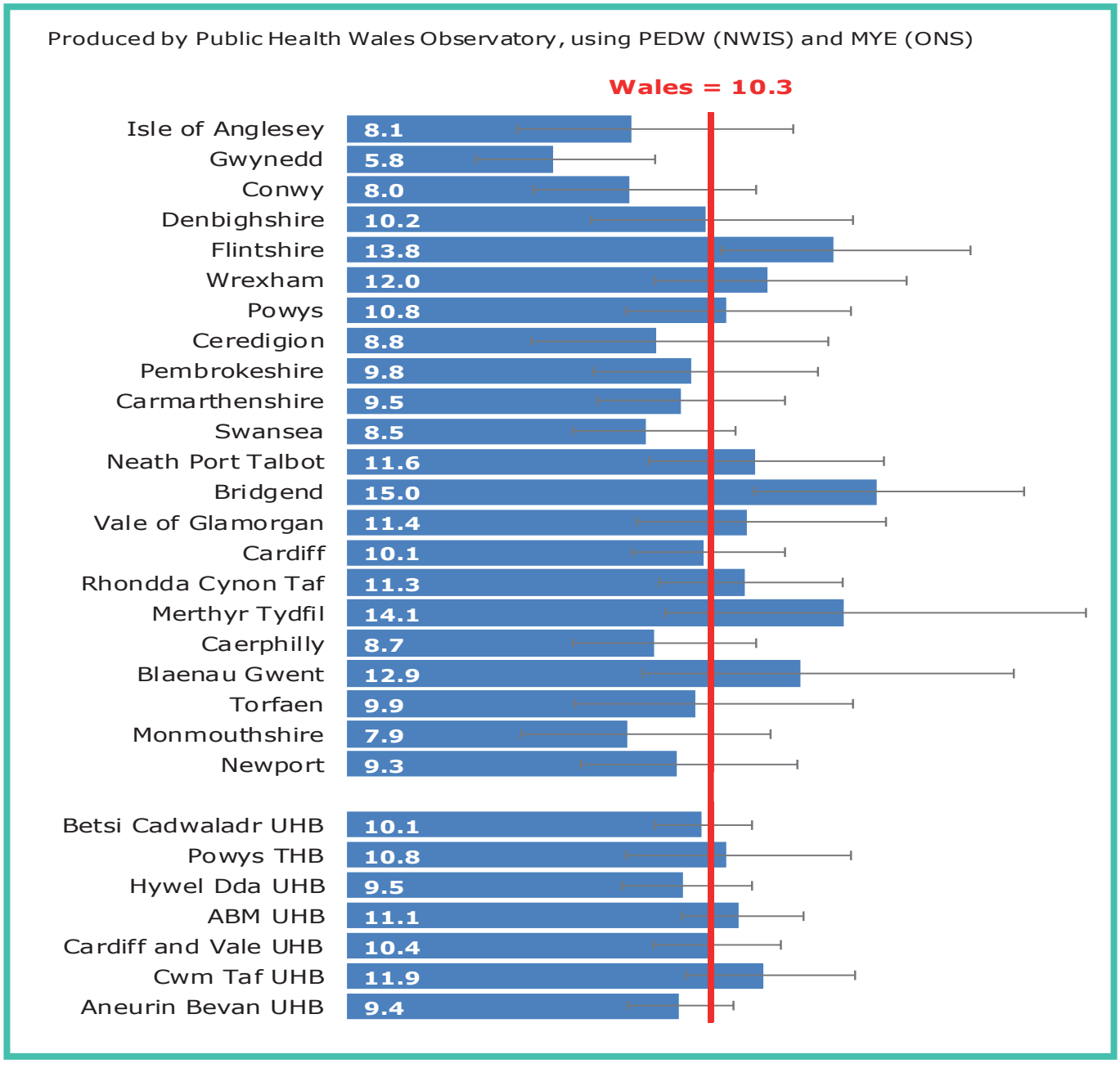
NICE outlines a range of evidence based treatments for obesity from modification of diet and exercise through to surgical treatment.

6.2.1 Bariatric surgery

In Wales there are on average 320 bariatric surgery admissions each year (based on patient episode data (PEDW) and OPCS code bariatric surgery). This equates to 10.3 per 100,000 population. Data on BMI suggests that there are potentially 71,000 people in Wales eligible for bariatric surgery based on their BMI.

Levels of current activity therefore are significantly fewer than expected for the population size and prevalence. There is wide fluctuation in bariatric surgery rates when viewed at local authority level (Figure 54) although this evens out slightly when considered at health board level. This may be an indication of inequity and a lack of ease of access and acceptability.

FIGURE 54: Bariatric Surgery admissions, European Age-Standardised Rate (EASR) per 100,000, all persons, Wales health boards and local authorities, 2014 - 2016



7
Conclusion

Conclusion

Levels of overweight and obesity in Wales are rising and are projected to continue to rise.

The impact of these levels of obesity on the health, wellbeing and life expectancy of the population are already having an impact and this is expected to grow.

The disease burden resulting for obesity and overweight in our population is not borne equally; those from the most disadvantaged communities experience much higher levels of obesity. This reflects the underlying determinants of obesity including access to a healthy diet; the opportunity to be active and the promotion and availability of cheap, high energy food products.

The solutions to the obesity and overweight problem in Wales are complex and will required collective action across the public, private and third sector. Part of the problem is the growing normalisation of obesity and overweight. As a society we can no longer recognise what a healthy weight looks like and this can be a real barrier to motivation to change. The stigma associated with obesity can be a significant barrier to acceptance of the need for change or in seeking help to change.

Failure to act has significant consequences for individuals and for society as a whole. The increasing rates of obesity are thought likely to bring about reductions in life expectancy for the first time in several generations. The impact on the health and care system is already significant and can only increase.

8

Supporting Information

8

Supporting Information

8.1 Sources of additional information

Maps of Obesity prevalence in Wales
WelshHealthSurveyObesityResource_AnimatedMap.pptx

National Diet and Nutrition Survey
National nutrition survey: http://gov.wales/statistics-and research/national-diet-nutrition-survey-rolling-programme/?lang=en

Making a Difference: Investing in Sustainable Health and Well-being for the People of Wales Supporting Evidence 2016 report http://www.wales.nhs.uk/sitesplus/documents/888/Making%20A%20Difference_Evidence%28finalE_2018%29web.pdf

8.2 List of abbreviations

CMP	Child Measurement Programme
FSA	Food Standards Agency
HBSC	Health Behaviour in School-aged Children
NAO	National Audit Office
NSW	National Survey for Wales
NWIS	NHS Wales Informatics Service
ONS	Office for National Statistics
WG	Welsh Government
WHS	Welsh Health Survey
WIMD	Welsh Index of Multiple Deprivation

9

Glossary

9

Glossary

10 steps to a Healthy Weight
10 steps to a Healthy Weight is part of the Every Child programme. It was launched in July 2017 and aims to prevent childhood overweight/obesity before children start school. It sets out 10 steps to help families in Wales bring up happy, healthy children.

Bariatric Surgery
The term, bariatric surgery, is used to define a group of procedures that can be performed to facilitate weight loss, although these procedures can also be performed for other conditions. It includes stomach stapling, gastric bypasses, sleeve gastrectomy and gastric band maintenance, performed on the stomach and/or intestines to limit the amount of food an individual can consume. Such surgery is used in the treatment of obesity for people with a BMI above 40, or for those with a BMI between 35 and 40 who have health problems such as type 2 diabetes or heart disease.

Child Measurement Programme (CMP)
The Child Measurement Programme for Wales is a surveillance programme and was set up in 2011 when the Welsh Government asked Public Health Wales to undertake a national height and weight measuring programme for Wales. The school nursing team measure and weigh every child in reception class unless parents have opted their child out of the programme. At the end of the school year the measurement information is downloaded in such a way that individual children cannot be identified. The data is used to better understand how children in Wales are growing and plan services for children accordingly.

Disability Adjusted Life Years (DALY)
DALYs equal the sum of years of life lost (YLLs) and years lived with disability (YLDs).

Food and You Survey
Food and You is a biennial consumer survey exploring and collects information on the public's attitudes, reported knowledge and behaviour relating to food safety and production and food issues. This involves food purchasing, storage, preparation, consumption and factors that may affect these. It is carried out on behalf on the Food Standards agency and started in 2010.

Health Behaviour in School-aged Children (HBSC)
Health Behaviour in School-aged Children (HBSC) is a school-based survey with data collected through self-completion questionnaires administered in the classroom. The international standard questionnaire enables the collection of common data across participating countries and thus enables the quantification of patterns of key health behaviours, health indicators and contextual variables. These data allow cross-national comparisons to be made. The use of self-reported surveys administered in schools under examination conditions is particularly appropriate for the nature of the questions asked, with previous research finding that young people are most likely to report risky/sensitive behaviours accurately with this methodology. However, there is still a possibility that some respondents give socially acceptable, rather than accurate, responses.

Further information can be found in the report below '2013/14 Health Behaviours in School-aged Children (HBSC) Wales: key findings' published by Welsh Government:

http://gov.wales/docs/caecd/research/2015/151022-health-behaviour-school-children-2013-14-key-findings-en.pdf

National Diet and Nutrition Survey (NDNS)
The NDNS comprises an interview, a four-day diet diary and collection and analysis of blood and urine samples. Results are used by government to monitor the diet and nutritional status of the population, to provide the evidence base for policy development and to track progress towards public health nutrition objectives such as reducing sugar, calories, saturated fat and salt intakes.

The National Diet and Nutrition Survey Rolling Programme (NDNS RP) is a continuous programme of fieldwork designed to assess the diet, nutrient intake and nutritional status of the general population aged 1.5 years and over living in private households in the UK. The NDNS RP provides high quality data on the types and quantities of foods consumed by individuals, from which estimates of average nutrient intakes for the population can be derived. Sample for Wales was boosted in order to achieve representative data specific for Wales.

Policy responsibility for the diet and nutrition of the population in Wales rests with the Welsh Government.

National Survey for Wales 2016-17
The National Survey for Wales is an annual Welsh Government survey of a representative sample of over 10,000 people across Wales. The survey covers a range of topics with a focus on wellbeing and people's views on public services.

The Wellbeing of Future Generations (Wales) Act
The Wellbeing of Future Generations (Wales) Act 2015 is legislation requiring public bodies - such as local authorities, health boards and organisations like the Arts and Sports Councils of Wales - to put long-term sustainability at the forefront of their thinking, and work with each other along with other relevant organisations (such as third sector groups) and the public to prevent and tackle problems.

The Act places a requirement on 44 devolved public bodies to set and publish well-being objectives that are designed to maximise their contribution to achieving each of the well-being goals, and they must take all reasonable steps to meet those objectives. The Act also forms Public Service Boards most of these work on a local authority footprint, although several are working together.

Welsh Health Survey (WHS)
BMI data in this case for change is obtained from the Welsh Health Survey (WHS). WHS a self-completion questionnaire covering a range of health-related issues, including health status, lifestyle and health behaviours, and health service use. It was established in 2003 and ended in 2015.

In 2016, WHS was replaced by the National Survey for Wales results were published annually. An achieved sample of around 15,000 adults and 3,000 children was aimed for per year, to include a minimum of 600 adults from each local authority area. The survey relied on people's own understanding of their health rather than a clinical assessment of their medical condition. The change in results due to the change in survey methodology appears to be small for overweight and obesity, and the rates are broadly consistent with those reported for 2015.

Please note that, there is evidence to show that some people tend to under report weight and/or over report height resulting in an underestimation of the prevalence of overweight and obesity. However this still provides the most robust source of data and trend.

Welsh Index of Multiple Deprivation (WIMD)

This is a small area-level composite measure of socioeconomic deprivation accounting for local levels of income, employment, health, education, access to services, community safety, physical environment and housing. It is generally grouped as quintiles. Deprivation is as classified according to the 2014 Welsh Index of Multiple Deprivation fifths. Further information about the Welsh Index of Multiple Deprivation (WIMD) is available via the followinglink:http://gov.wales/statistics-and-research/welsh-index-multiple-deprivation/?lang=en

10
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[2]Public Health (Wales) Act 2017. [Online] 2017. Available at: http://www.legislation.gov.uk/anaw/2017/2/contents/enacted [Accessed: 10th Apr 2018]

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