



# Ayrshire Healthy Weight Strategy

## Volume II: Fact File

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## **1. Introduction**

This document, aims to provide an overview of the evidence which supports the production and need for the actions outlined in Volume I of the Ayrshire Healthy Weight Strategy. This will be achieved by highlighting information on the following key areas:

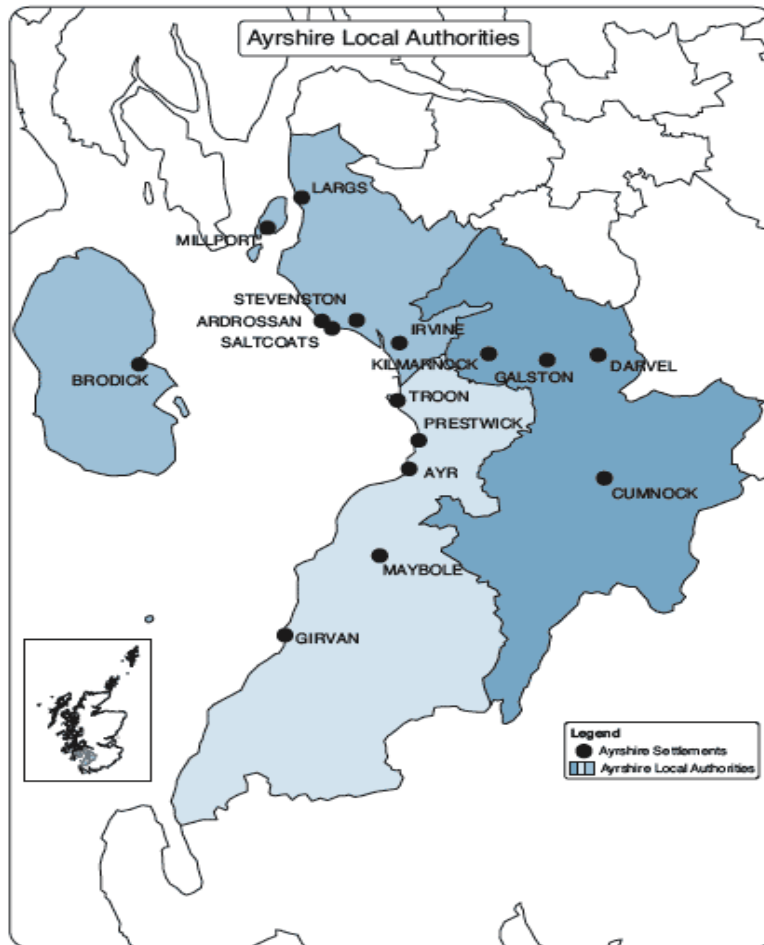
- The demography of Ayrshire and Arran
- The national obesity policy drivers
- The local obesity policy drivers
- Healthy weight related data
- Local healthy weight services and activities

This report forms a crucial part of an evidence base which has been used to inform and drive the work of the multi-agency Healthy Weight Strategy Group.

## **2. Demography and Epidemiology of Ayrshire and Arran**

Ayrshire and Arran is located in mid south central Scotland and is surrounded by Inverclyde, Renfrewshire and East Renfrewshire in the North, by Lanarkshire in the East and Dumfries and Galloway in the South.

Figure 1: Map of NHS Ayrshire and Arran



Source: <http://www.scotland.gov.uk/Publications/2007/03/07153942/4>

NHS Ayrshire and Arran covers an area of 750,464 square hectares in the south west of Scotland, from Skelmorlie in the north, to Ballantrae in the south and from Muirkirk in the east, to Arran in the west. The area covers a mix of rural and urban development with an overall population density of 0.56 people per square hectare, slightly below the national average.

NHS Ayrshire & Arran boundaries are coterminous with those of the three local authorities: North, South and East Ayrshire Councils.

## Population profile for Ayrshire and Arran

Ayrshire and Arran is comprised of three locality areas: North, East and South Ayrshire, which all vary in population size (*Table 1*). The mid-year population estimates for 2011 indicate that North Ayrshire has the largest population of 135,130, compared to 120,200 in East Ayrshire and 111,560 in South Ayrshire<sup>1</sup>. Within each of the three areas, there are more females than males.

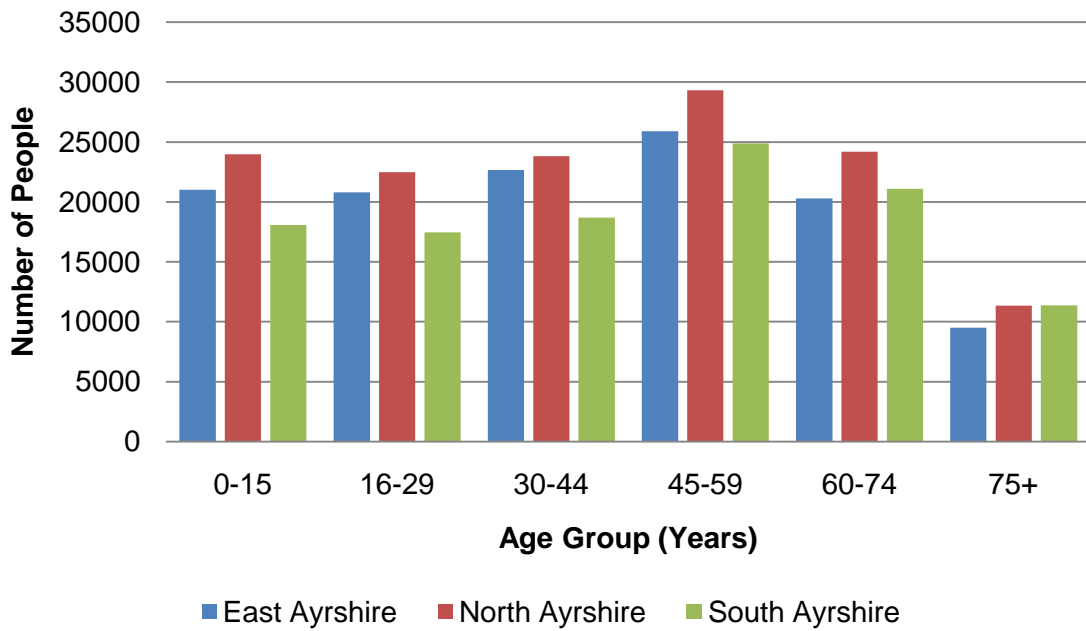
*Table1: Overview of estimated mid-year population for East, North and South Ayrshire and for Scotland*

	<b>East</b>	<b>North</b>	<b>South</b>	<b>Scotland</b>
Population size - All	120,200	135,130	111,560	5,254,800
Females	61,970	70,982	58,024	2,706,600
Males	58,230	64,148	53,536	2,548,200

The age profiles for each area in Ayrshire and Arran are similar (*Figure 2*), with North Ayrshire having the highest number of individuals in each age group, apart from the over 75 age group where the number is relatively similar to South Ayrshire. Apart from the 60-74 years and over 75 years age groups, East Ayrshire has a bigger population across all age groups than South Ayrshire.

<sup>1</sup> General Register Office of Scotland (GROS) 2012

Figure 2: Age profile of East, North and South Ayrshire based on 2011 mid-population estimates



Source: General Register Office of Scotland (GROS) 2012

### Demography of Ayrshire and Arran

Comparison between the Census results of 2011 with that of 2001 indicate an increase in the Ayrshire and Arran population of 1.47%, compared to an increase in the national average of 4.6%<sup>2</sup>.

Population increases have been shown in all three local authority areas between 2001 and 2011: 2.1% in East Ayrshire, 1.7% in North Ayrshire and 0.6% in South Ayrshire.

<sup>2</sup> [www.scotlandcensus.gov.uk/en/censusresults/downloadablefiles.html](http://www.scotlandcensus.gov.uk/en/censusresults/downloadablefiles.html)

## Minority Ethnic population

At the time of writing, ethnicity data from the 2011 Census had not been published. The 2001 Census<sup>3</sup>, however, indicated that the proportion of the population in ethnic minority groups in Scotland was 2% in comparison to 1.3% in 1991. For Ayrshire and Arran, the corresponding figures were 0.68% in 2001 in comparison to 0.49% in 1991. Nevertheless, NHS Ayrshire and Arran has the fifth lowest non European population in Scotland, with East, South, and North Ayrshire Council areas having the 5-7<sup>th</sup> lowest rates among the 32 local authorities.

The largest ethnic groups in Ayrshire and Arran are fairly similar throughout Ayrshire and Arran's localities: Chinese (0.18%) and Indian (0.16%). However, there is slight variation in East Ayrshire compared to the other council areas with an Indian population of 0.07% compared to a Pakistani cultural population of 0.14%.

## Socioeconomics of Ayrshire and Arran

Scottish Index of Multiple Deprivation (SIMD) data indicates that there are significant differences in socio-economic status and deprivation levels throughout Ayrshire; with areas of significantly high poverty close to areas of very low poverty. It is recognised, furthermore, that many people who are dependent on income related benefits or who are otherwise socially excluded live out with recognised areas of poverty.

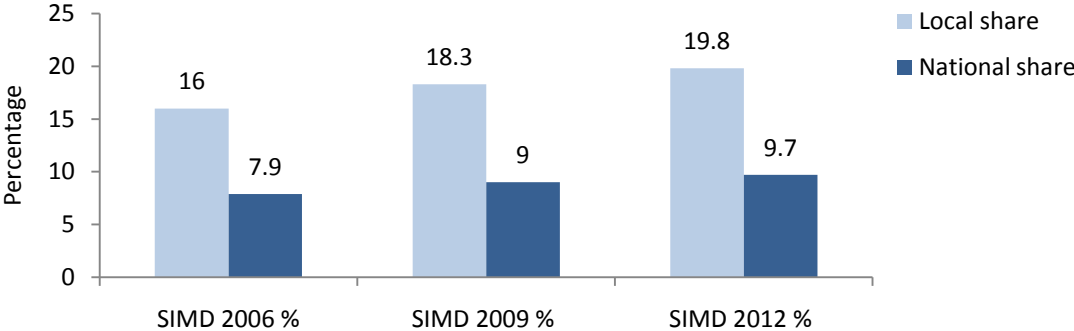
From the 2012 SIMD data<sup>4</sup>, there are 6505 recognised datazones in Scotland, of which Ayrshire and Arran has 480. 95 of the 480 datazones are within the 15% most deprived in Scotland, giving Ayrshire and Arran a national share of 9.7% and a local share of 19.8%. Both the local and national shares have increased since 2006 (*Figure 3*). Ayrshire and Arran has the second highest proportion of datazones within the 15% most deprived category, behind Greater Glasgow and Clyde.

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<sup>3</sup> [http://www.gro-scotland.gov.uk/files1/stats/key\\_stats\\_chareas.pdf](http://www.gro-scotland.gov.uk/files1/stats/key_stats_chareas.pdf)

<sup>4</sup> Scottish Index of Multiple Deprivation <http://www.scotland.gov.uk/Topics/Statistics/SIMD/Publications>

Figure 3: Ayrshire and Arran’s local and national share of 15% most deprived datazones between 2006 and 2012



Differences in deprivation share not only exist nationally, but also between the three local authority areas, as shown in Table 2.

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Table 2: National share of most deprived datazones within the 5%, 10%, 15% and 20%<sup>5</sup>

	<b>5% most deprived</b>			<b>10% most deprived</b>			<b>15% most deprived</b>			<b>20% most deprived</b>		
	No. of data zones	National Share (%)	Local Share (%)	No. of data zones	National Share (%)	Local Share (%)	No. of data zones	National Share (%)	Local Share (%)	No. of data zones	National Share (%)	Local Share (%)
<b>East Ayrshire Council</b>	12	3.7	7.8	20	3.1	3.1	32	3.3	20.8	48	3.7	31.2
<b>North Ayrshire Council</b>	12	3.7	6.7	31	4.8	17.3	46	4.7	25.7	62	4.8	34.6
<b>South Ayrshire Council</b>	7	2.2	4.8	11	1.7	7.5	17	1.7	11.6	23	1.8	15.6

<sup>5</sup> <http://simd.scotland.gov.uk/publication-2012/simd-2012-results/overall-simd-results/most-deprived-datazones/>

### East Ayrshire

East Ayrshire has 154 datazones. The most deprived datazone is Shortlees and it is ranked 28<sup>th</sup> in Scotland. The least deprived datazone in East Ayrshire in SIMD 2012 is Stewarton East, ranked 6446<sup>th</sup> in Scotland.

### North Ayrshire

North Ayrshire has 179 datazones. The most deprived datazone is Ardrossan Central, and it is ranked 21<sup>st</sup> in Scotland. The least deprived datazone in North Ayrshire is Largs North, ranked 6109<sup>th</sup> in Scotland.

### South Ayrshire

South Ayrshire has 147 datazones. The most deprived datazone is Lochside, Braehead and Whitletts, and it is ranked 39<sup>th</sup> in Scotland. The least deprived datazone in South Ayrshire in SIMD 2012 is Alloway and Doonfoot, ranked 6252<sup>nd</sup> in Scotland.

Inequalities between the most deprived and least deprived are considerable, demonstrating the need to continue targeting those living in the most deprived areas in the attempt to reduce health inequalities.

## **3. National Obesity Policy Drivers**

The drive for improvements in the proportion of the population with a healthy weight has been widely supported across the political landscape of Scotland. Consequently, a number of strategic and policy documents exist for obesity, healthy eating and physical activity (*Table 3*).

Table 3: National policy drivers

<b>Document title</b>	<b>Summary</b>	<b>Web link</b>
Preventing Overweight and Obesity in Scotland: A Route Map Towards a Healthy Weight (2010) and Obesity Route Map Action Plan (2011)	Scotland's obesity strategy which aims to support the majority of Scotland's populations to be within a healthy weight range.  The Action Plan sets out how this will be achieved.	<a href="http://www.scotland.gov.uk/Topics/Health/Healthy-Living/Healthy-Eating">http://www.scotland.gov.uk/Topics/Health/Healthy-Living/Healthy-Eating</a>
CEL 01 2012 Health Promoting Health Service	Framework to support NHS hospitals, including community hospitals, to be health improving. Specific actions for food and health exist within the framework.	<a href="http://www.healthscotland.com/topics/settings/health/hphs.aspx">http://www.healthscotland.com/topics/settings/health/hphs.aspx</a>
SIGN Guideline 115: Management of obesity	Provides evidence based recommendations on the prevention and treatment of obesity within the clinical setting, in children, young people and adults. The focus of prevention is on primary prevention, defined here as intervention when individuals are at a healthy weight and/or overweight, to prevent or delay the onset of obesity.	<a href="http://www.sign.ac.uk/guidelines/fulltext/115/index.html">http://www.sign.ac.uk/guidelines/fulltext/115/index.html</a>
Improving Maternal & Infant Nutrition: A Framework for Action	Provides strategic direction for NHS Boards, local authorities and other partners to improve the nutrition of pregnant women, babies and young children	<a href="http://scotland.gov.uk/Publications/2011/01/13095228/0">http://scotland.gov.uk/Publications/2011/01/13095228/0</a>
Recipe for Success: Scotland's national food and drink policy	Scotland's food and drink policy	<a href="http://www.scotland.gov.uk/Publications/2009/06/25133322/0">http://www.scotland.gov.uk/Publications/2009/06/25133322/0</a>
Schools (Health Promotion and Nutrition) (Scotland) Act	Legislation placed on local authorities to provide food and drinks in schools that meet specific nutritional standards	<a href="http://www.scotland.gov.uk/Topics/Education/Schools/HLivi/foodnutrition">http://www.scotland.gov.uk/Topics/Education/Schools/HLivi/foodnutrition</a>

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<b>Document title</b>	<b>Summary</b>	<b>Web link</b>
Let's Make Scotland More Active: A strategy for physical activity (2003)	Provides strategic direction for the promotion and development of physical activity in Scotland.	<a href="http://www.scotland.gov.uk/Publications/2003/02/16324/17895">http://www.scotland.gov.uk/Publications/2003/02/16324/17895</a>
Reaching Higher (2007)	Scotland's revised sport strategy	<a href="http://www.scotland.gov.uk/Publications/2007/03/07105145/0">http://www.scotland.gov.uk/Publications/2007/03/07105145/0</a>
Greening of the NHS Estate	Policy driver/ programme to look at utilising NHS grounds as areas for outdoor activity	<a href="http://www.healthscotland.com/topics/settings/green-exercise-partnership/index.aspx">http://www.healthscotland.com/topics/settings/green-exercise-partnership/index.aspx</a>
On Your Marks...The Legacy Plan for Scotland (2009)	Legacy plan for the Glasgow Commonwealth Games 2014. Contains four key areas: active, flourishing, connected and sustainable.	<a href="http://www.scotland.gov.uk/Topics/ArtsCultureSport/Sport/MajorEvents/Glasgow-2014/Commonwealth-games">http://www.scotland.gov.uk/Topics/ArtsCultureSport/Sport/MajorEvents/Glasgow-2014/Commonwealth-games</a>
Start Active, Stay Active: a report on physical activity for health from the four home countries' Chief Medical Officers (2011)	Contains guidelines for physical activity for early years, children and young people, adults and older adults as agreed by the UK's four Chief Medical Officers.	<a href="http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_128209">http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_128209</a>
Good Places Better Health (2008) Good Places Better Health for Scotland's Children (2011)	Scottish Government's strategy on health and the environment. Childhood obesity is one of four topics addressed and recommendations are proposed to improve the environment for children	<a href="http://www.scotland.gov.uk/Topics/Health/Healthy-Living/Good-Places-Better-Health">http://www.scotland.gov.uk/Topics/Health/Healthy-Living/Good-Places-Better-Health</a> <a href="http://www.scotland.gov.uk/Topics/Health/Healthy-Living/Good-Places-Better-Health/Findings-Recommendations/GPBHreport">http://www.scotland.gov.uk/Topics/Health/Healthy-Living/Good-Places-Better-Health/Findings-Recommendations/GPBHreport</a>

## 4. Local Obesity Policy Drivers

The promotion of healthy weight and the reduction of obesity levels have remained a priority at a local level within Ayrshire and Arran. This is reflected in a range of local targets, strategies and policies.

### HEAT Targets

HEAT targets are NHS specific targets relating to health improvement, efficiency and governance improvements, access to services and treatment appropriate to individuals. In relation to healthy weight, the associated HEAT target for 2013/14 is for NHS Ayrshire & Arran:

- To achieve 1,057 completed child health weight interventions over the three years ending March 2014.

### Public Health Department Business Plan

NHS Ayrshire & Arran's Public Health Department delivers action in response to an annual business plan<sup>6</sup>. This is an organisation wide plan. Actions in relation to obesity are contained in the plan. In addition, obesity is one of the Board's four public health priorities alongside alcohol, tobacco and mental wellbeing.

### Single Outcome Agreements (SOAs)

Ayrshire and Arran's public health work relies on effective partnership working with the three local authorities and other agencies. It is crucial that the aims and objectives of the local authorities parallel those of the Healthy Weight Strategy.

All three Single Outcome Agreements make reference to healthy weight and Table 4 describes the national indicators from Scotland Performs that should be reported on via the SOAs, and the local indicators that are in place to do so.

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<sup>6</sup>Public Health Department Business Plan: 1<sup>st</sup> April 2013- 31<sup>st</sup> March 2014 (2013) Public Health Department, NHS Ayrshire and Arran

*Table 4: Scotland Performs national indicators linked to healthy weight and corresponding local indicators*

<b>National Indicator</b>	<b>Local Indicator</b>
Improve children's dental health	<ul style="list-style-type: none"> <li>• Percentage of children in P1 with no obvious dental decay experience</li> </ul>
Increase the proportion of babies with a healthy birth weight	<ul style="list-style-type: none"> <li>• Percentage of babies with a healthy birth weight</li> </ul>
Increase the proportion of healthy weight children	<ul style="list-style-type: none"> <li>• Percentage of children exclusively breastfed at 6-8 weeks</li> <li>• Percentage of children with a healthy weight in P1</li> </ul>
Increase physical activity	<ul style="list-style-type: none"> <li>• Pool attendances</li> <li>• Leisure centre attendances</li> <li>• Sporting participation</li> <li>• Active School sessions</li> </ul>

Furthermore, other local strategies are currently being implemented which support work towards achieving improvements in healthy weight (see Table 5).

Table 5: Local strategy and policy drivers in relation to healthy weight

<b>Document title</b>	<b>Summary</b>	<b>Web link</b>
Fit for the Future: North Ayrshire's Physical Activity and Sport Strategy (2010-2015)	North Ayrshire strategy for physical activity has four main themes: opportunities, places and spaces, strengthening and developing communities and promotion and profile	<a href="http://www.north-ayrshire.gov.uk/Documents/EducationalServices/FitForTheFuture.pdf">http://www.north-ayrshire.gov.uk/Documents/EducationalServices/FitForTheFuture.pdf</a>
East Ayrshire Council Leisure and Cultural Strategy	Sport, leisure and physical activity strategy for East Ayrshire	No link available
NHS Ayrshire & Arran Anticipatory Care Strategy (in development)	This strategy will set out plans for anticipatory care in relation to a number of topic areas including physical activity, diet and obesity	Unavailable at present as still in development
NHS Ayrshire & Arran Oral Health Strategy (2012-2022)	NHS A&A strategy which sets out plans for oral health promotion and disease prevention. Currently in development	<a href="http://athena/publichealth/Documents/Financialised%20Oral%20health%20strategy%202012-23.pdf">http://athena/publichealth/Documents/Financialised%20Oral%20health%20strategy%202012-23.pdf</a> (internal link only)
NHS Ayrshire & Arran Infant Feeding Strategy (2009 – 2013)	Strategy to promote, protect and improve breastfeeding, and healthy infant feeding practices in Ayrshire	<a href="http://www.nhsaaa.net/media/83264/ifstratfull.pdf">http://www.nhsaaa.net/media/83264/ifstratfull.pdf</a>
NHS Ayrshire & Arran We Want Good Health the Same as You (2009-2014)	Strategy to improve the health of children with learning difficulties and adults with learning disabilities	No link available

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<b>Document title</b>	<b>Summary</b>	<b>Web link</b>
NHS Ayrshire & Arran Maternity Strategy (2012-16)	Outlines the high level actions needed to provide high quality maternity services efficiently and equally across Ayrshire	<a href="http://www.nhsaaa.net/media/77600/mats/tratvol1v2.pdf">http://www.nhsaaa.net/media/77600/mats/tratvol1v2.pdf</a>
Towards a Mentally Flourishing Ayrshire and Arran	Strategy to improve population mental health and wellbeing	<a href="http://athena/publichealth/Documents/TAMFAA.pdf">http://athena/publichealth/Documents/TAMFAA.pdf</a> (internal link only)
Healthy Working Lives Workplan (2013-14)	Work plan describing the Healthy Working Lives team's priorities for 2013-14	No link available
Prison Action Plan (2011-14)	Action Plan for HMP Kilmarnock supporting the Health Promoting Prison Framework	No link available

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## 5. Healthy Weight Related Data

### 5.1 Predicted obesity levels in the UK and Scotland

The prevalence of obesity has more than doubled in the last 25 years worldwide, including in the UK. As a result, being overweight has become a normal condition and Britain is now becoming an obese society. Without action this trend will only get worse.

Table 6 shows the point estimate of prevalence of obesity in the UK predicted at 2050. This modelling predicts that 60% of adult men, 50% of adult women and about 25% of all children under 16 could be obese. As can be seen, steep increases in levels of BMI among males and females are expected. The marked growth predicted in relation to morbid obesity among males is of particular concern, especially as the risk of disease is known to be increased in men.

*Table 6: Percentage of age-specific population obese at 2007 and 2050*

Age	Males (%)		Females (%)	
	2007	2050	2007	2050
1-20	7	26	10	26
21-30	15	42	13	30
31-40	28	65	22	47
41-50	26	55	23	52
51-60	32	65	27	49
61-70	31	64	32	59
71-80	28	63	27	44

**Source:** Tackling Obesity: Future Choices – Modelling Future Trends in Obesity & Their Impact on Health, 2007

Meanwhile, the picture in Scotland is even worse than the UK as a whole. Scotland is experiencing an obesity epidemic already and has one of the highest levels of obesity worldwide.

The level of adult obesity in Scotland was estimated to be 28% in 2011, and, if Scottish obesity follows the same trend as the United States, it is predicted that rates could reach 40% by 2030 (Scottish Government 2012a).

## **5.2 The risks and costs of obesity**

As overweight and obesity levels continue to rise in Scotland and the UK as a whole, a number of serious risks and costs associated with elevated BMI need to be considered toward developing effective local strategies, services and interventions.

### **5.2.1 Risks of obesity in children**

#### Impact on physical health

Studies have shown a link between weight gain in childhood and the development of several cardiovascular risk factors such as:

- hypertension (high blood pressure)
- dyslipidaemia (imbalance of fatty substances found in the blood)
- adverse changes in left ventricular mass
- hyperinsulinaemia (abnormally high levels of insulin in the blood) (SIGN 2010).

Evidence suggests that these cardiovascular risk factors seen in obese children are carried into adulthood, therefore, obesity in children increases risk of morbidity and premature death in adults.

Other potential health problems seen in obese children include exacerbation of asthma, mechanical problems particularly back and foot pain, and increased risk of type 1 and type 2 diabetes (SIGN 2010).

#### Impact on psychological health

In childhood, overweight and obesity are known to have a significant impact on psychological well-being with many children suffering from poor self-esteem, negative self-image i.e. perceiving themselves as unattractive, depression, disordered eating and bulimia. These negative consequences seem to affect girls more than boys. In addition, obese children are more likely to report experiences of teasing, social exclusion, discrimination and prejudice (SIGN 2010).

#### Impact on long-term health

The most important long-term consequence of childhood obesity is its persistence into adulthood. Studies have shown that the higher a child's BMI and the older the child, the more likely they will be an overweight or obese adult (SIGN 2010). Children are more likely to be overweight or obese as an adult if one of their parents is obese, with the risk increasing if both parents are obese.

### **5.2.2 Risks of obesity in adults**

Being overweight or obese has a significant impact on health (SIGN 2010). People who are obese are more likely to suffer from:

- type 2 diabetes
- cardiovascular disease including heart disease and stroke
- some types of cancer such as gallbladder, pancreas, oesophageal, colon, prostate, colon, breast, and ovarian cancer
- musculoskeletal disorders including osteoarthritis
- dementia
- depression
- kidney and liver disease
- asthma
- sleep apnoea

In particular, the risk of developing diabetes type 2 is about 20 to 80 times more likely for people who are obese compared with normal weight people. In addition, coronary heart disease - which itself is slightly more common among obese people - is 2-3 times more common among diabetic men and five times more common among diabetic women.

### Maternal Obesity

Obesity causes substantial risk to the health of both the mother and her baby. Women who are obese during pregnancy have an increased risk of developing type 2 diabetes, impaired glucose tolerance and gestational diabetes. Obese women also have higher rates of induction of labour, caesarean section, stillbirth, congenital abnormalities, premature birth and post-partum haemorrhage (Modder and Fitzsimons 2010). Babies born to mothers with gestational diabetes are likely to have a higher overall fat mass, a higher percent body fat and are at greater risk of obesity as they progress through childhood, than those born to mothers with normal glucose tolerance. Even where the obese mother's glucose tolerance is normal, obesity during pregnancy still increases the level of fat in the baby and predisposes towards bigger, heavier babies (SACN 2011).

Given the rise in overweight and obesity in the general population and in women of childbearing, the number of women likely to be entering their first pregnancy already overweight or obese is of concern (Scottish Government 2011). After birth many women retain a proportion of the weight they gained during pregnancy therefore go into a second or subsequent pregnancy with an even higher BMI (Rooney and Schauburger 2002).

Table 7 shows the predicted impact on health in Scotland 20 years from now for selected conditions attributed to obesity. The predicted impact will reflect, perpetuate and potentially increase social inequalities in health in Scotland.

Table 7: Predicted impact of obesity on health in Scotland

	2003	2030
<b>High blood pressure attributed to obesity</b>	488,496 cases (36% of all cases)	867,872 cases (50% of all cases)
<b>Type 2 diabetes attributed to obesity</b>	87,216 cases (62% of all cases)	154,950 cases (75% of all cases)
<b>Heart attacks attributed to obesity</b>	27,111 cases (20% of all cases)	48,166 cases (31% of all cases)
<b>Stroke attributed to obesity</b>	6,174 cases (7% of all cases)	10,969 cases (11% of all cases)

Source: Tackling Obesity: Future Choices – Modelling Future Trends in Obesity & Their Impact on Health, 2007

### 5.2.3 The economic cost of obesity

The economic implications of the current obesity trends are substantial. Without action, it is estimated that by 2050 obesity-related diseases will cost society £50 billion per year as shown in Table 8. The NHS costs attributable to overweight and obesity are predicted to double in the UK to £10 billion per year by 2050.

The economic impact will be felt sooner in Scotland, where it is estimated that the direct healthcare costs of obesity will almost double by 2030.

Table 8: Estimated costs of elevated BMI in the UK, 2001-2050 (£billion per year)

	2001	2007	2015	2025	2050
<b>Extra NHS costs of elevated BMI predicted by the micro-simulation model</b>	0	2.2	4.1	6.3	7.7
<b>% of all overweight who are obese</b>	33%	40%	48%	52%	66%
<b>Predicted extra NHS costs of obesity alone</b>	0	1.3	2.9	4.3	6.1
<b>NHS costs of obesity alone</b>	1.0	2.3	3.9	5.3	7.1
<b>NHS costs of elevated BMI</b>	2.0	4.2	6.4	8.3	9.7
<b>Total wider costs of BMI</b>	2.0	15.8	27.0	37.2	49.9

Source: Tackling Obesity: Future Choices – Modelling Future Trends in Obesity & Their Impact on Health, 2007

## 5.3 National prevalence

### 5.3.1 Overweight and obese children in Scotland

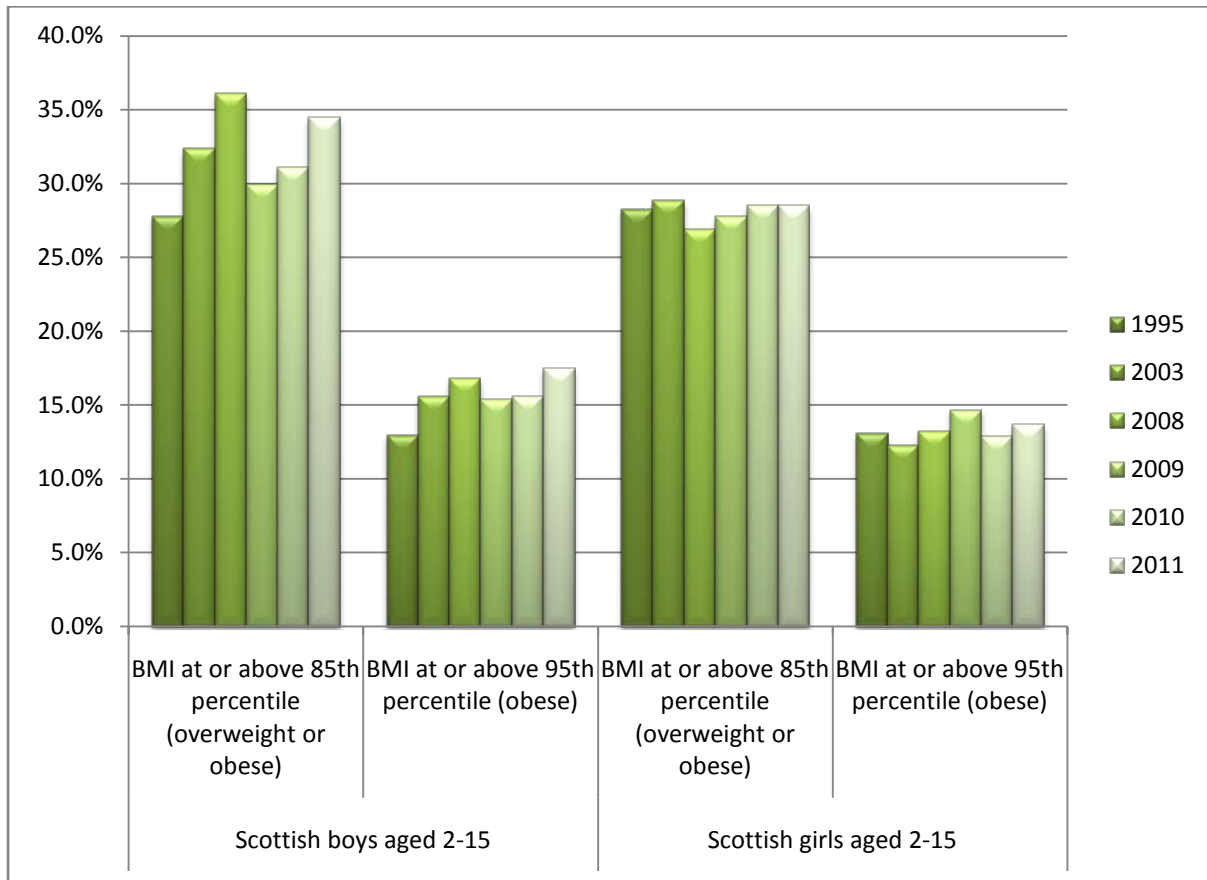
The classifications of children's BMI set out below are derived from the BMI percentiles of the UK 1990 reference curves (referred to as the National BMI percentiles classification), and SIGN recommends that these references be used for population surveillance in Scotland.

Percentile cut-off	Description
At or below 5 <sup>th</sup> percentile	Underweight
Above 5 <sup>th</sup> percentile and below 85 <sup>th</sup> percentile	Healthy weight
At or above 85 <sup>th</sup> percentile and below 95 <sup>th</sup> percentile	Overweight
At or above 95 <sup>th</sup> percentile and below 98 <sup>th</sup> percentile	Obese
At or above 98 <sup>th</sup> percentile	Morbidly obese

With respect to the above classifications, 65.6% of children aged 2-15 in 2011 had a healthy weight, a small decrease from 70.3% in 1998; 31.6% of children were overweight or obese in 2011, a slight increase since 1998 when the prevalence was 28.0%; and 15.7% of children were obese or morbidly obese in 2011, representing a small rise in prevalence from 13.0% in 1998.

The BMI trends over time have largely been driven by boys, with little change seen for girls in the 1998-2011 period (*Figure 4*). Boys were significantly less likely than girls to be a healthy weight (65.1% compared to 69.8%) and were more likely to be overweight or obese (32.7% compared to 28.0%) (2008-2011 data combined). From *Figure 4*, it can be seen that levels of overweight or obese ( $\geq 85^{\text{th}}$  percentile) and obese ( $\geq 95^{\text{th}}$  percentiles) among Scottish boys aged 2-15 years old rose steadily from 1995 to 2008, with a drop in levels observed in 2009 which have since begun climbing again; the peak for obese ( $\geq 95^{\text{th}}$  percentile) in 2011 is the highest recorded for boys since 1995, while the 2011 figure for overweight or obese ( $\geq 85^{\text{th}}$  percentile) was just a little short of the peak observed in 2008.

Figure 4: Percentages of boys and girls aged 2-15 years old in Scotland who are overweight or obese (BMI at or above 85<sup>th</sup> percentile) and obese (BMI at or above 95<sup>th</sup> percentile)



Source: Scottish Health Survey Annual Report 2011, Volume 2: Main Report (derived from Table 5.2 in report)

Healthy weight prevalence was significantly associated with age though not in a linear fashion. Prevalence of healthy weight was generally highest in the early years (aged 2-7) and lowest among boys aged 10-11 (56.6%) and girls aged 12-13 years old (62.9%). Boys aged 10-11 and girls aged 12-13 had the highest prevalence of overweight or obesity (41.9% and 33.4%, respectively).

Several other key factors were also associated with children’s BMI measurements. There was a strong association between parental BMI and child BMI. Children with parents who are either a healthy weight or underweight were less likely to be overweight or obese than children of obese parents (21.0% compared to 40.1%). In addition, boys in the lowest income households were more likely than those in other household income groups to be obese (19.7% compared to 14.2% in the highest income group). There was no clear pattern by household income for girls. Area deprivation was significantly associated with obesity. Girls and boys in the most deprived quintile were less likely to be a healthy weight and more likely to be obese than girls and boys in the least deprived areas. Children living in the 15% most deprived areas in Scotland had a significantly higher prevalence of obesity than those living elsewhere (18.7% compared with 14.5%).

### 5.3.2 Overweight and obese adults in Scotland

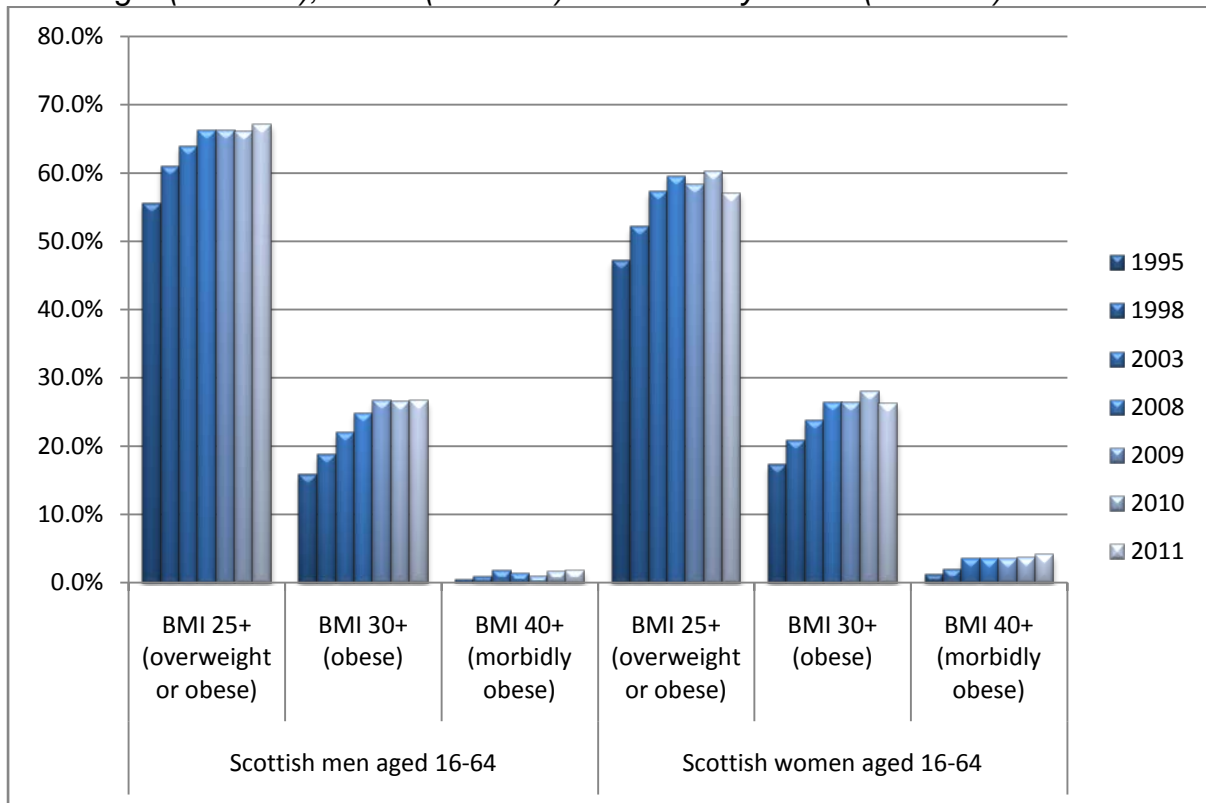
This section presents Scottish adult data for the prevalence of overweight including obese (BMI 25 kg/m<sup>2</sup> or more), obese (BMI 30 kg/m<sup>2</sup> or more), and morbidly obese (BMI 40kg/m<sup>2</sup> or more).

In 2011, over a quarter (27.7%) of adults aged 16 and over were obese (27.7% of men and 27.6% of women). Just under two-thirds (64.3%) were overweight or obese. Men were significantly more likely than women to be overweight or obese (69.2% compared with 59.6%).

Between 1995 and 2011, the proportion of adults aged 16-64 years old who were overweight or obese (BMI of 25 kg/m<sup>2</sup> and over) increased by just over 10% from 52.4% to 62.2%, and the prevalence of obesity (BMI of 30 kg/m<sup>2</sup> and over) among this age group also increased from 17.2% to 26.5%. The greatest increases were seen between 1995 and 2008 with figures remaining broadly stable since then for both men and women (see *Figure 5*).

Obesity prevalence increased significantly with age in 2011, from 13.4% in those aged 16-24 to a peak of 35.4% in those aged 65-74. Those aged 16-24 were least likely to be overweight including obese (36.0%), while those aged 65-74 were most likely to be (77.5%).

Figure 5: Percentages of men and women aged 16-64 in Scotland who are overweight (BMI 25+), obese (BMI 30+) and morbidly obese (BMI 40+)



Source: Scottish Health Survey Annual Report 2011, Volume 1: Main Report (derived from Table 7.2 in report)

Based on a combination of their BMI and waist circumference measurements, women were more likely than men to be classified as being at high (or greater) risk of conditions like type 2 diabetes, hypertension and cardiovascular disease (45.4% compared to 34.4% of men). Among men, the proportion at high (or greater) risk of such conditions increased with age up until age 55-64 at which point it levelled out. For women the proportion at high risk also increased with age but up until age 65-74 before dipping for those aged 75 and over. While 15.7% of men were overweight according to their BMI, when the combined measure of BMI and waist circumference was used they were classified as being at *no increased risk* of obesity-related diseases. The comparable figure for women was just 4.1%.

There was a significant association between disease risk and both socioeconomic classification and household income with clearer patterns observed for women than for men. Women living in semi-routine and routine households were the most likely to be classified as at a high (or greater) risk of obesity-related disease, whereas those in professional and managerial households were least likely to be (52.1% compared with 41.0%). Men living in the least deprived SIMD quintile were least likely to have health risks (49.1% had *no increased risk*, compared to 44.7%-46.6% of those living elsewhere). For women, the proportion at *no increased risk* decreased in line with deprivation (from 45.3% in the least deprived quintile to 29.8% in the most deprived).

Age, economic status and physical activity levels were all independently significantly associated with being at high risk of disease for both men and women. For men,



education level, marital status and self-assessed health status were additional significant factors. For women, SIMD,<sup>7</sup> parental NS-SEC,<sup>8</sup> smoking status and presence of a long-standing illness were independently associated with being at high risk of disease.

## 5.4 Local prevalence

### 5.4.1 Overweight and obese children in Ayrshire and Arran

At present, measurements of BMI - and associated percentiles relative to the Child Growth Chart - are carried out for all children in Primary 1 (P1) in all primary schools across Ayrshire and Arran. This corresponds to children aged about 5 years old. Local data is currently available for children who were born in the period from 2002/3 to 2006/7 – this translates as data recorded in the period from 2007/08 to 2011/12.

Tables 9 and 10 respectively, show the numbers and percentages of local P1-aged children who are overweight, obese and morbidly obese. It can be seen that the number of overweight children (i.e., BMI centile  $\geq 85$ ) in Ayrshire and Arran rose sharply over a 5-year period from 2007/08 to 2011/12, increasing by 261 children. This is a notable 5% increase in overweight, rising from 21.7% of all P1-aged children in 2007/08 to 26.6% in 2011/12. In addition, the 5-year increase in the percentage of overweight boys was more than double that of girls (7.0% v. 2.7%).

Notable 5-year increases in obesity (i.e., BMI centile  $\geq 95$ ) also occurred among P1-aged children. There were over a hundred more obese children recorded locally in 2011/12 compared to 2007/08 (a 5-year increase of just over 2%). The increase in obesity among boys was much more marked than girls (3.4% v. 0.6%), and the contrast between genders even more pronounced than that observed for overweight.

Morbid obesity levels remained fairly static over 5 years for girls (about 6% of P1-aged girls in Ayrshire and Arran are currently morbidly obese), while a small rise in morbid obesity occurred among the boys (increasing from 7% in 2007/08 to just over 8% in 2011/12; this translates as an increase of more than 30 boys).

Figure 6 shows the trends for overweight and obese by CHP area. The 5-year increases in overweight children were respectively 8.3% in North Ayrshire, 3.2% in South Ayrshire and 1.1% in East Ayrshire. The increases in South and East Ayrshire were predominantly brought about by increases in the percentage of overweight boys, but the increase in North Ayrshire was the result of sizable increases in both overweight boys and girls (10.0% and 6.4% increases respectively).

The level of obese children has slightly fallen over 5 years in East Ayrshire from 11.6% to 10.6%, while levels have risen by about a similar amount in North and South Ayrshire (5-year increases of 3.3% and 3.5% respectively). East Ayrshire has also seen a 2.6% drop in the level of morbid obesity among P1-aged children, while the level in North Ayrshire has risen slightly by 0.9% and the level in South Ayrshire has progressively and markedly risen by 3.1%.

<sup>7</sup> Scottish Index of Multiple Deprivation

<sup>8</sup> National Statistics Socio-economic Classification

Table 9: NUMBERS of P1-aged children in Ayrshire and Arran who are overweight, obese and morbidly obese

	When BMI recorded (year)	Child's date of birth* (year)	East Ayrshire			North Ayrshire			South Ayrshire			Ayrshire & Arran		
			Girls	Boys	All	Girls	Boys	All	Girls	Boys	All	Girls	Boys	All
<b>OVERWEIGHT:</b> <i>BMI on or above 85th centile</i>	2007/08	2002/03	112	95	207	135	144	279	85	98	183	332	337	669
	2008/09	2003/04	103	114	217	110	135	245	79	87	166	292	336	628
	2009/10	2004/05	100	99	199	156	203	359	110	113	223	366	415	781
	20010/11	2005/06	136	120	256	184	207	391	101	127	228	421	454	875
	20011/12	2006/07	120	148	268	196	236	432	102	128	230	418	512	930
<b>OBESE:</b> <i>BMI on or above 95th centile</i>	2007/08	2002/03	57	51	108	64	67	131	32	38	70	153	156	309
	2008/09	2003/04	51	47	98	51	60	111	36	34	70	138	141	279
	2009/10	2004/05	39	48	87	72	90	162	49	45	94	160	183	343
	20010/11	2005/06	60	50	110	73	105	178	43	59	102	176	214	390
	20011/12	2006/07	53	69	122	82	113	195	47	59	106	182	241	423
<b>MORBIDLY OBESE:</b> <i>BMI on or above 98th centile</i>	2007/08	2002/03	37	40	77	43	47	90	14	21	35	94	108	202
	2008/09	2003/04	27	27	54	28	31	59	23	21	44	78	79	157
	2009/10	2004/05	28	27	55	46	52	98	28	21	49	102	100	202
	20010/11	2005/06	32	32	64	50	65	115	26	33	59	108	130	238
	20011/12	2006/07	27	38	65	47	68	115	28	38	66	102	144	246

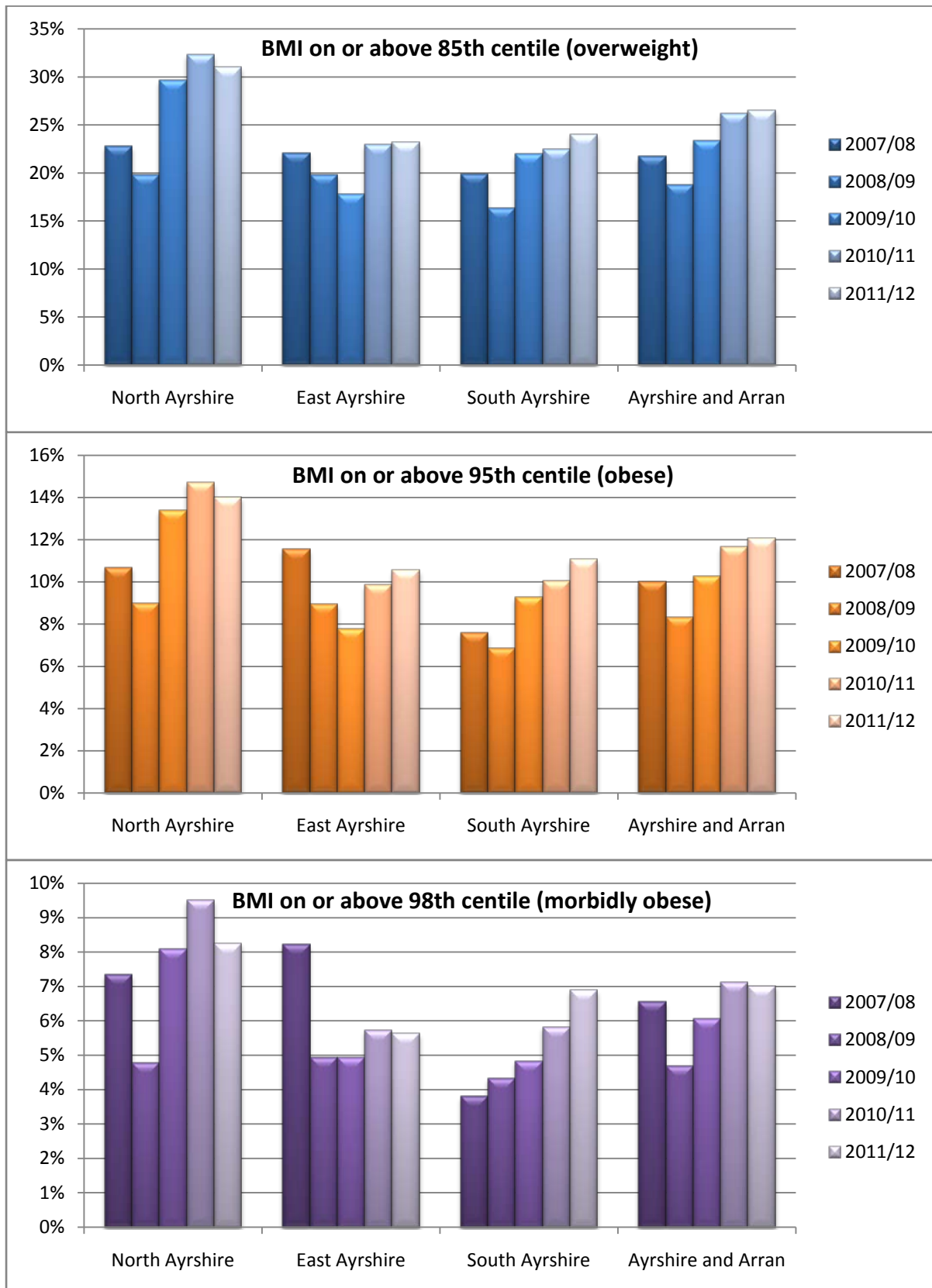
\* All dates of birth run from 1<sup>st</sup> of March in one calendar year to 28<sup>th</sup> of February the following calendar year

Table 10: PERCENTAGES of P1-aged children in Ayrshire and Arran who are overweight, obese and morbidly obese

	When BMI recorded (year)	Child's date of birth* (year)	East Ayrshire			North Ayrshire			South Ayrshire			Ayrshire & Arran		
			Girls	Boys	All	Girls	Boys	All	Girls	Boys	All	Girls	Boys	All
<b>OVERWEIGHT:</b> <i>BMI on or above 85th centile</i>	2007/08	2002/03	22.7%	21.5%	22.1%	22.9%	22.7%	22.8%	19.1%	20.7%	19.9%	21.7%	21.7%	21.7%
	2008/09	2003/04	19.9%	19.8%	19.9%	17.4%	22.5%	19.9%	15.6%	17.1%	16.3%	17.6%	19.9%	18.8%
	2009/10	2004/05	18.1%	17.7%	17.8%	27.0%	32.1%	29.7%	21.3%	22.8%	22.0%	22.2%	24.6%	23.4%
	20010/11	2005/06	24.5%	21.4%	23.0%	31.8%	32.8%	32.3%	19.5%	25.6%	22.5%	25.5%	26.9%	26.2%
	20011/12	2006/07	21.6%	24.8%	23.2%	29.3%	32.7%	31.1%	20.9%	27.4%	24.1%	24.4%	28.7%	26.6%
<b>OBESE:</b> <i>BMI on or above 95th centile</i>	2007/08	2002/03	11.6%	11.5%	11.6%	10.8%	10.6%	10.7%	7.2%	8.0%	7.6%	10.0%	10.1%	10.0%
	2008/09	2003/04	9.9%	8.2%	9.0%	8.0%	10.0%	9.0%	7.1%	6.7%	6.9%	8.3%	8.4%	8.3%
	2009/10	2004/05	7.1%	8.6%	7.8%	12.5%	14.2%	13.4%	9.5%	9.1%	9.3%	9.7%	10.8%	10.3%
	20010/11	2005/06	10.8%	8.9%	9.9%	12.6%	16.6%	14.7%	8.3%	11.9%	10.1%	10.7%	12.7%	11.7%
	20011/12	2006/07	9.5%	11.6%	10.6%	12.3%	15.7%	14.0%	9.6%	12.6%	11.1%	10.6%	13.5%	12.1%
<b>MORBIDLY OBESE:</b> <i>BMI on or above 98th centile</i>	2007/08	2002/03	7.5%	9.0%	8.2%	7.3%	7.4%	7.4%	3.2%	4.4%	3.8%	6.2%	7.0%	6.6%
	2008/09	2003/04	5.2%	4.7%	4.9%	4.4%	5.2%	4.8%	4.5%	4.1%	4.3%	4.7%	4.7%	4.7%
	2009/10	2004/05	5.1%	4.8%	4.9%	8.0%	8.2%	8.1%	5.4%	4.2%	4.8%	6.2%	5.9%	6.1%
	20010/11	2005/06	5.8%	5.7%	5.7%	8.7%	10.3%	9.5%	5.0%	6.7%	5.8%	6.5%	7.7%	7.1%
	20011/12	2006/07	4.9%	6.4%	5.6%	7.0%	9.4%	8.3%	5.7%	8.1%	6.9%	6.0%	8.1%	7.0%

\* All dates of birth run from 1<sup>st</sup> of March in one calendar year to 28<sup>th</sup> of February the following calendar year

Figure 16: Percentages of P1-aged children in Ayrshire and Arran who are overweight, obese and morbidly obese



Source: Child Health Surveillance School System (CHSP-S)

## 5.4.2 Overweight and obese adults in Ayrshire and Arran

### Notes on local adult BMI data:

BMI data for adults were available from general practice records in Ayrshire and Arran. Four specific time points were selected for data extraction and analysis - 1<sup>st</sup> January 1999, 1<sup>st</sup> January 2004, 1<sup>st</sup> January 2009 and 1<sup>st</sup> January 2012 - but these records were found to be incomplete. The further back in time, the more incomplete the data records were in relation to the BMI measurements of patients: 61% of general practice patients in 1999 did not have their BMI recorded compared to 37% in 2012. This discrepancy means that local adult BMI trends determined from the GP data records need to be cautiously viewed and interpreted. One possible effect might be over-estimation of BMI at the earlier time point if BMI recording was more likely among overweight or obese patients at that time.

In addition to this potential problem, fewer general practices submitted BMI data in 2012 compared to 2009. Specifically, 51 out of 59 local practices released patient BMI data in 2009 (covering the period from 1999 to 2009), while only 38 out of 55 practices submitted comparable data in 2012. This variation was due to the recent transfer of practice data records from GPASS to EMiS Web for GPs, with a number of practices (n=8) not using GPASS in 2009, and a number of practices (n=17) not up and running on the EMiS Web at the time of the recent data request in 2012. Again, this variation needs to be taken into account when interpreting any observed trends in the adult BMI data.

The BMI data from 1999 to 2009 covers 341,915 patients, amounting to 88.1% of the total practice lists in Ayrshire & Arran in 2009. The recent BMI data covers 261,326 patients, amounting to 67.6% of the total practice lists in Ayrshire and Arran in 2012.

### Adult trends in overweight and obesity:

Table 11 shows the percentage of adult patients in the GP records who were overweight (BMI on or above 25), obese (BMI 30+) and morbidly obese (BMI 40+). It can be seen that every age group in every CHP area in Ayrshire and Arran experienced increases in adult overweight, obese and morbidly obese levels. The percentage of overweight adults (BMI 25+) steadily increased from 50% in 1999 to 62% in 2012. The level of adult obesity almost doubled from 16% in 1999 to 28% in 2012, and the level of morbid obesity tripled from 1.3% to 3.8%.

Table 12 shows what these percentage increases mean in terms of the projected numbers of adults in the local population. Based on mid-year population estimates, the 13-year increases in overweight, obese and morbidly obese would effectively translate as increases in Ayrshire and Arran of about 40,000, 50,000 and 8,000 adults respectively, with the current number of overweight adults standing at about 190,000, the number of obese adults at 87,000, and the number of morbidly obese adults at 11,600. These figures, and the continuing rising trends, clearly have serious resource and capacity implications for local health services.

Figure 7 shows that all age groups demonstrate marked increases over time in obesity levels. Increases in morbid obesity are also evident in all age groups. It is interesting to note that the age group showing the most rapid increase in morbid obesity levels is the 35 to 64 year age group (increasing from 1.6% in 1999 to 4.7% in 2012), and the knock on effect of that trend appears to be that the age group above (65 to 74 years old) has experienced the most rapid increase in obesity levels (increasing from 18.3% in 1999 to 33.0% in 2012). This appears to represent a domino effect, with ever-increasing levels of overweight and obese among younger generations driving the levels upward in older groups over time.

Further analysis of the data reveals that obesity levels in Ayrshire and Arran have increased at a comparable rate over 13 years for both men and women aged 15 to 64 years old, with an increase of about 12% in BMI $\geq$ 30 for both groups; men from 14.6% in 1999 to 26.9% in 2012, and women from 17.1% in 1999 to 29.1% in 2009.

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Table 11: *Body Mass Index (BMI) of patients in Ayrshire and Arran at 1 Jan 1999, 2004, 2009 and 2012: PERCENTAGES of patients within BMI categories recorded in GP records, by age group and CHP area in Ayrshire and Arran*

BMI category	GP records at 1st Jan	East Ayrshire					North Ayrshire					South Ayrshire					Ayrshire and Arran				
		15-34 yrs	35-64 yrs	65-74 yrs	75+ yrs	ALL (15+)	15-34 yrs	35-64 yrs	65-74 yrs	75+ yrs	ALL (15+)	15-34 yrs	35-64 yrs	65-74 yrs	75+ yrs	ALL (15+)	15-34 yrs	35-64 yrs	65-74 yrs	75+ yrs	ALL (15+)
BMI 25+ (overweight)	1999	34.8%	59.1%	63.4%	55.8%	52.1%	32.3%	55.7%	61.0%	51.7%	49.4%	31.6%	54.7%	57.6%	48.1%	48.6%	32.9%	56.5%	60.6%	51.9%	50.0%
	2004	34.4%	58.5%	67.0%	57.2%	54.4%	34.2%	57.9%	64.7%	54.4%	53.4%	33.7%	56.5%	64.4%	53.6%	53.0%	34.1%	57.7%	65.3%	55.0%	53.6%
	2009	39.0%	64.2%	70.9%	58.2%	59.1%	39.2%	63.6%	69.3%	55.9%	58.5%	38.7%	62.7%	68.3%	56.2%	58.1%	39.0%	63.5%	69.5%	56.7%	58.6%
	2012	41.4%	67.4%	74.7%	63.7%	62.8%	41.4%	66.6%	71.9%	62.4%	61.7%	41.6%	65.8%	71.4%	62.2%	61.7%	41.5%	66.6%	72.5%	62.7%	62.0%
BMI 30+ (obese)	1999	9.8%	20.9%	20.9%	15.8%	17.3%	9.2%	18.9%	17.8%	14.3%	15.8%	8.8%	17.8%	16.2%	12.5%	14.9%	9.3%	19.2%	18.3%	14.2%	16.0%
	2004	11.7%	22.5%	24.8%	18.3%	20.2%	12.5%	22.1%	23.0%	15.8%	19.6%	11.4%	20.5%	22.6%	15.1%	18.5%	12.0%	21.8%	23.4%	16.3%	19.5%
	2009	16.6%	28.6%	30.7%	21.1%	25.6%	16.2%	27.8%	28.2%	18.5%	24.5%	14.8%	26.3%	27.2%	17.6%	23.2%	16.0%	27.7%	28.7%	19.0%	24.5%
	2012	18.3%	32.2%	36.1%	24.5%	29.1%	18.1%	31.8%	32.4%	22.9%	28.1%	17.6%	30.8%	31.3%	21.7%	27.2%	18.0%	31.7%	33.0%	22.9%	28.1%
BMI 40+ (morbidly obese)	1999	0.7%	1.8%	1.3%	0.6%	1.4%	0.8%	1.6%	1.0%	0.8%	1.3%	0.6%	1.4%	1.1%	0.7%	1.1%	0.7%	1.6%	1.1%	0.7%	1.3%
	2004	1.4%	2.4%	1.9%	0.7%	2.0%	1.4%	2.5%	1.6%	0.9%	2.0%	1.3%	2.2%	1.5%	0.7%	1.8%	1.4%	2.4%	1.7%	0.8%	1.9%
	2009	2.4%	4.0%	2.8%	1.4%	3.3%	2.1%	3.5%	2.5%	0.7%	2.8%	1.8%	3.2%	2.5%	1.0%	2.6%	2.2%	3.6%	2.6%	1.0%	2.9%
	2012	2.9%	5.3%	3.5%	1.5%	4.1%	2.9%	4.7%	3.4%	1.4%	3.8%	2.5%	4.3%	2.8%	1.4%	3.4%	2.8%	4.7%	3.3%	1.5%	3.8%

Source: 1999-2009, data submitted by 51 of 59 local general practices and extracted from GPASS; 2012, data submitted by 38 of 55 local general practices and extracted from EMiS Web for GPs

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Table 12: ESTIMATED NUMBERS of overweight and obese adults based on GP BMI data records and mid-year population estimates, \* by age group and CHP area in Ayrshire and Arran

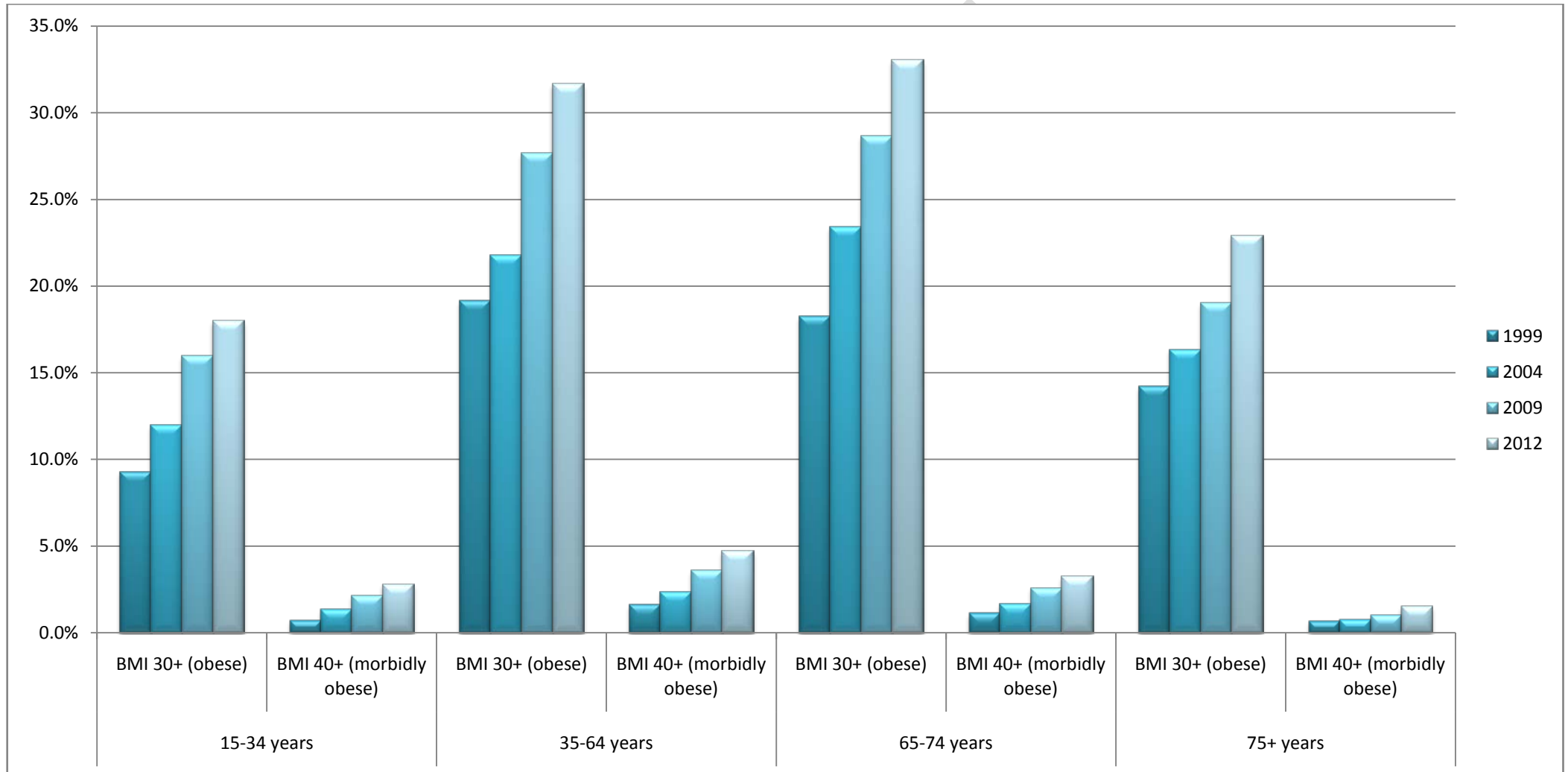
BMI category		East Ayrshire					North Ayrshire					South Ayrshire					Ayrshire and Arran				
		15-34 yrs	35-64 yrs	65-74 yrs	75+ yrs	ALL (15+)	15-34 yrs	35-64 yrs	65-74 yrs	75+ yrs	ALL (15+)	15-34 yrs	35-64 yrs	65-74 yrs	75+ yrs	ALL (15+)	15-34 yrs	35-64 yrs	65-74 yrs	75+ yrs	ALL (15+)
BMI 25+ (overweight)	1999	10,997	27,784	6,911	4,582	50,892	11,650	29,887	7,323	4,826	54,859	8,541	24,885	6,612	4,592	45,407	31,184	82,495	20,850	14,060	151,107
	2004	9,894	29,107	7,400	4,879	53,363	10,971	32,775	8,309	5,386	59,546	8,137	26,737	7,620	5,410	49,454	29,011	88,672	23,335	15,691	162,376
	2009	11,002	32,990	8,126	5,226	59,112	12,139	36,570	9,527	5,951	66,018	9,123	29,955	8,355	6,136	54,859	32,276	99,579	26,029	17,315	180,042
	2012	11,698	34,278	8,898	6,061	63,144	12,736	37,504	10,361	7,077	69,581	9,923	30,740	9,148	7,076	58,413	34,355	102,477	28,367	20,199	190,929
BMI 30+ (obese)	1999	3,107	9,800	2,282	1,294	16,891	3,305	10,116	2,144	1,330	17,492	2,374	8,097	1,860	1,197	13,954	8,787	27,988	6,276	3,847	48,325
	2004	3,378	11,214	2,742	1,561	19,777	4,020	12,517	2,948	1,563	21,842	2,755	9,719	2,674	1,522	17,303	10,189	33,514	8,370	4,661	59,004
	2009	4,667	14,711	3,522	1,890	25,571	5,034	15,966	3,869	1,974	27,614	3,483	12,592	3,320	1,927	21,890	13,224	43,366	10,733	5,814	75,237
	2012	5,157	16,392	4,298	2,332	29,290	5,569	17,917	4,670	2,597	31,759	4,193	14,408	4,006	2,471	25,765	14,918	48,717	12,926	7,385	86,690
BMI 40+ (morbidly obese)	1999	232	866	146	49	1,361	273	878	119	71	1,411	169	651	125	65	1,062	676	2,395	388	184	3,836
	2004	398	1,204	211	60	1,935	450	1,405	208	85	2,213	318	1,041	182	70	1,664	1,168	3,664	602	218	5,831
	2009	689	2,059	323	125	3,255	666	2,036	339	77	3,175	429	1,535	310	114	2,440	1,792	5,653	971	312	8,898
	2012	829	2,672	418	146	4,172	901	2,620	488	162	4,278	585	2,022	365	164	3,177	2,322	7,269	1,273	494	11,588

\* Mid-year population data were taken at 1998, 2003, 2008 and 2011 respectively in accordance with the times of data extraction from the GP records

Source: 1999-2009, data submitted by 51 of 59 local general practices and extracted from GPASS; 2012, data submitted by 38 of 55 local general practices and extracted from EMiS Web for GPs; GROS Scotland (mid-year population estimates)



Figure 7: Obese and morbidly obese adult trends in Ayrshire and Arran from 1999 to 2012 by age group

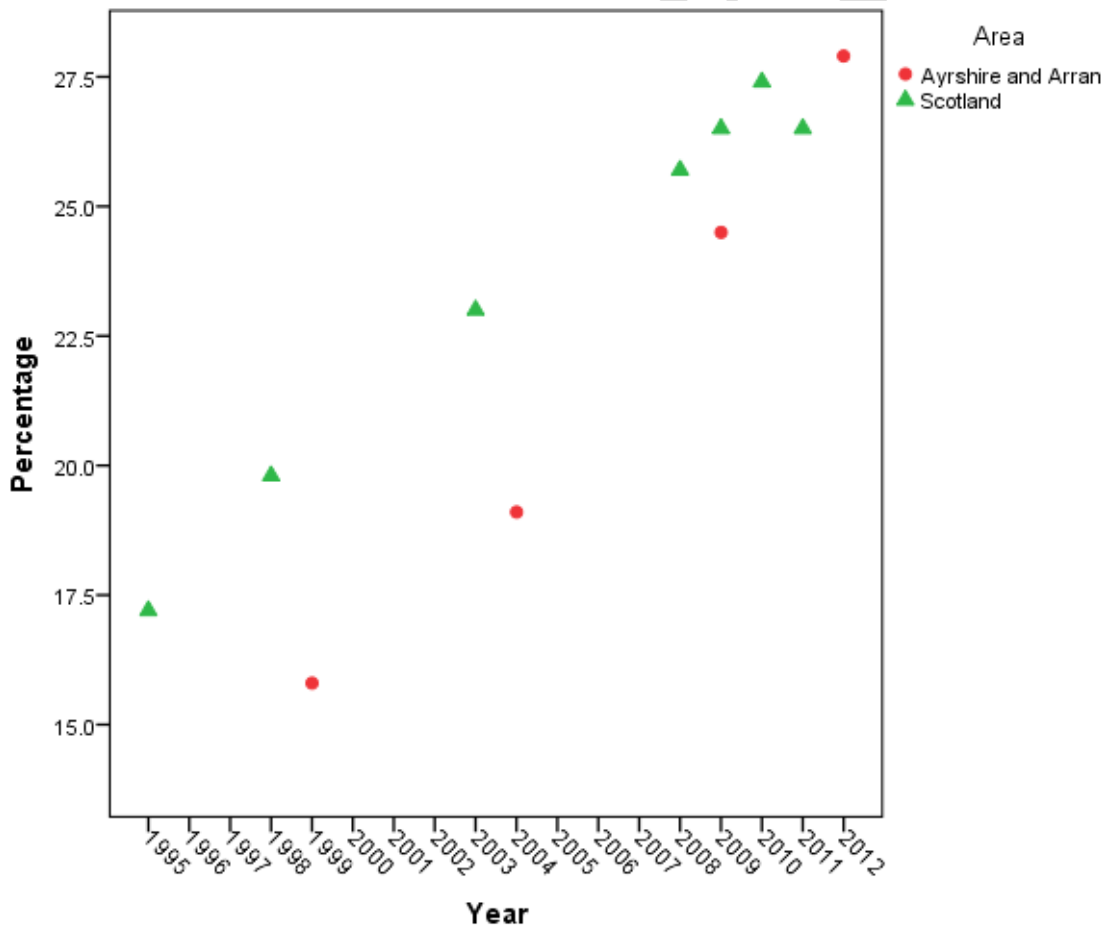


Source: 1999-2009, data submitted by 51 of 59 local general practices and extracted from GPASS;  
2012, data submitted by 38 of 55 local general practices and extracted from EMIS Web for GPs

## 5.5 Comparison of local and national adult obesity

Figure 8 compares the percentages of obese people aged 16-64 in Scotland with those aged 15-64 in Ayrshire and Arran. As can be seen, the prevalence of obesity was much lower locally than nationally in the 1990s and early 2000s. However, local estimates of obesity derived from GP records have now converged in the last few years with national estimates, so that local and national rates of obesity for adults of comparable age now both lie somewhere between 27-28%.

Figure 8: *Estimates of obese adults in Scotland (aged 16-64) and obese adults in Ayrshire and Arran (aged 15-64) from 1999 to 2012*



Source: Scottish data: Scottish Health Survey Annual Report 2011, Volume 1: Adults;  
Local data: GPASS (1999-2009) & EMiS Web for GPs (2012)

However, closer examination shows that there is currently a greater proportion of obese adult females in Ayrshire and Arran compared to Scotland, while the

figures for adult males are more evenly matched (Table 13). The figure for obese adult females is currently about 3% higher locally than nationally.

*Table 13: Comparison between obese in Scotland and Ayrshire and Arran*

	Scotland <sup>1</sup> 2011		Ayrshire and Arran <sup>2</sup> 2011 <sup>3</sup>	
	Men (16-64)	Women (16-64)	(Men 15-64)	Women (15-64)
BMI 30+ (obese)	26.7%	26.3%	26.9%	29.1%

**1 Source:** Scottish Health Survey 2011

**2 Source:** EMIS Web (2012)

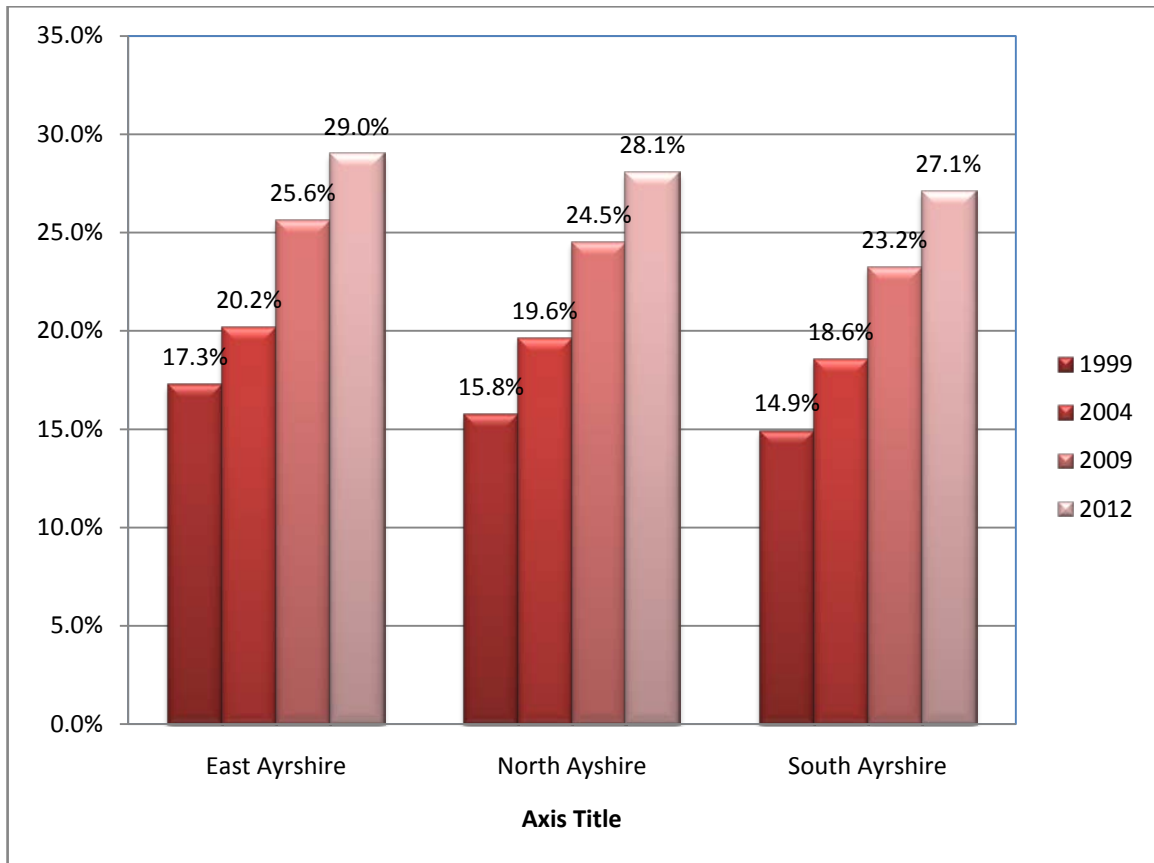
**3 NOTE:** though based on BMI data extracted at 1 Jan 2012, local data may effectively be regarded as year 2011 and therefore comparable to the Scottish figures for 2011

## 5.6 Local CHP area trends in adult obesity

All three CHP areas in Ayrshire and Arran have experienced comparable increases over 13 years in levels of adult obesity (Figure 9). The increase has been about 12% in all areas, in line with the increase observed for Ayrshire and Arran as a whole.

Although East Ayrshire has demonstrated consistently higher and South Ayrshire consistently lower levels of obesity at all time points over the relevant period of time, the differences between the three CHP areas have been relatively marginal.

Figure 9: Percentages of obese patients (BMI 30+) aged 15 years or more appearing in GP records, by CHP area in Ayrshire and Arran



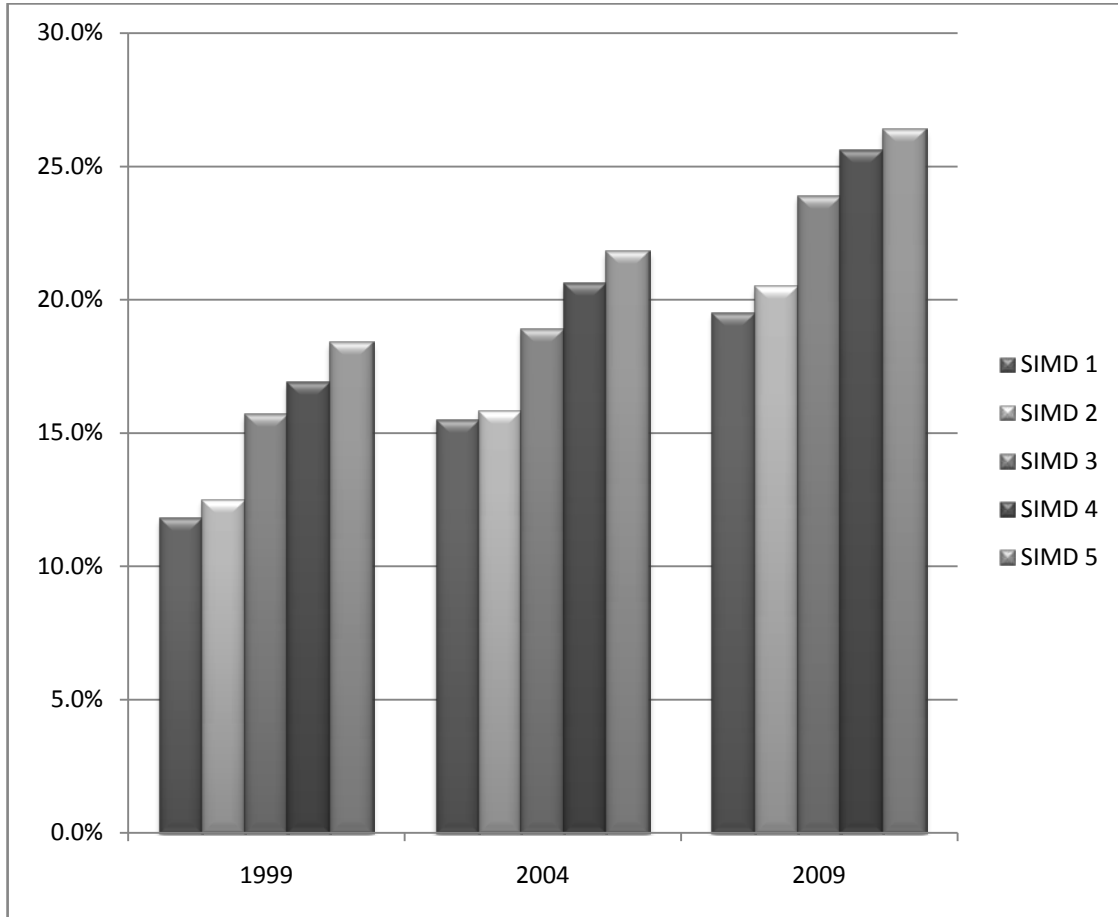
Source: 1999-2009, data submitted by 51 of 59 local general practices and extracted from GPASS; 2012, data submitted by 38 of 55 local general practices and extracted from EMiS Web for GPs

## 5.7 Local link between deprivation and adult obesity

Analysis of the general practice data shows a clear and consistent link between deprivation and obesity. In particular, Figure 10 shows that there were upward and fairly linear patterns in the percentages of obese GP patients across the deprivation quintiles from 1999 to 2009,<sup>9</sup> demonstrating that greater deprivation in Ayrshire and Arran is associated with higher levels of obesity.

<sup>9</sup> SIMD information (or more specifically the postcode information from which SIMD is derived) was available for 2012 but not sought due to technical difficulties arising from new sharing agreements applicable to the new EMiS Web for GPs, which would have required separate data requests to be made to each individual practice. The trends shown from 1999 to 2009 are sufficient to show the clear gradients across the SIMD categories at all time points.

Figure 10: Relationship in local GP patient data between deprivation status and observed levels of obesity (BMI 30+) (SIMD 1 least and SIMD 5 most deprived)



Source: All general practices in Ayrshire and Arran utilising GPASS, representing 51 of 59 local practices

It can be seen that all socio-economic groups of patients – whether affluent or deprived – experienced similar marked increases of around 8-9% in their adult obesity levels over the relevant 10-year period. As a result of this increase across the board, the gap between the most and least deprived categories in adult obesity levels has remained fairly constant at each time point, being around 6-7%.

Combining the observation that adult obesity levels have risen in a constant way across all SIMD categories with the observation that the level in Ayrshire and Arran as a whole has risen by about 12% from 1999 to 2012, it is assumed, reasonably, that obesity levels have likewise increased in relation to all SIMD categories over the same period by about 12% - the adult obesity level for the least deprived patients (SIMD1) being estimated at around 24%, and the level for the most deprived patients (SIMD5) at around 30%, in 2012.

## 6. Local Healthy Weight Services and Activities

We know that there are a range of activities, services and opportunities across Ayrshire which seek to improve healthy weight, either directly or indirectly. The majority of healthy weight services led by NHS Ayrshire and Arran are in direct response to obesity and obesity related problems. Conversely, the majority of activities offered in a community setting by the three local authorities or by third sector partners may look at increasing physical activity levels, improving cooking skills or improving education about healthy eating.

With this in mind, it is useful to consider a tiered approach to healthy weight opportunities and, indeed, weight management services. Figure 11 demonstrates this tiered approach and Figure 25 describes some of the local programmes and services that exist within each of the tiers.

Figure 11: Tiered approach to healthy weight

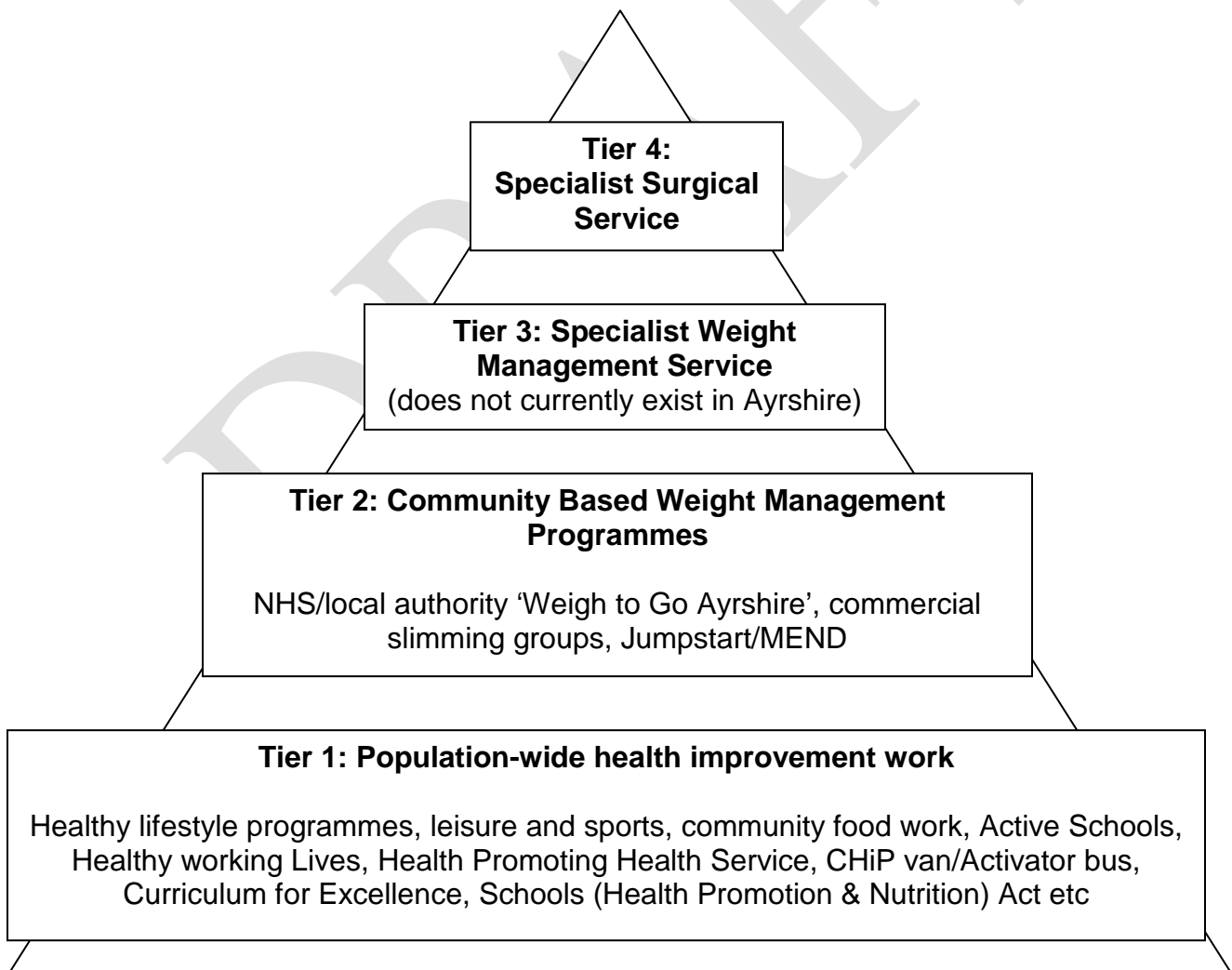


Table 14: Healthy weight initiatives, programmes and services in Ayrshire

Tier 1: Population-wide health improvement work

Programme Title	Description	Area			Age Group			
		North	South	East	Early Years	Children and Young People	Adults	Older Adults
JumpStart Choices	JumpStart is Ayrshire and Arran's child healthy weight programme. It is a group based intervention aimed at children aged 5-15 years who are above the 91 <sup>st</sup> centile. JumpStart Choices is the school based programme and is delivered over eight one-hour sessions. The programme focuses on healthy eating, physical activity and positive health behaviour change.	✓	✓	✓		✓		
Activity for Health	South Ayrshire Council's Exercise on Referral programme. The programme provides activities for clients with risk factors associated with coronary heart disease, including obesity.		✓				✓	✓
Mental Health Services (In-patients)	Cooking groups for in-patients within mental health services. The groups aim to promote healthy food choices, including meal planning, shopping for the food and cooking the food, and eating it at the end of the group, on a weekly basis. The CAN cook toolkit is used as part of the group to promote knowledge on healthy eating and making informed choices regarding healthy eating.		✓				✓	✓

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Community Learning Disability Team (East)	A monthly clinic which provides weigh in opportunities for clients with a learning disability and significant physical problems. The service has access to wheelchair scales for individuals who are wheelchair bound.			✓			✓	✓
CHiP van	The CHIP van is East Ayrshire Council's mobile healthy living centre targeting over 30 local communities during regular programmes of delivery. Free health checks are available for anyone who would like to access the service; blood pressure, height, weight, BMI, etc. Health check results and general lifestyle choices can be discussed and opportunities to make positive changes identified. The team mainly discuss issues around increasing activity levels, improving eating habits, smoking cessation and alcohol consumption. Signposting to local groups and services is provided for additional support and advice.			✓			✓	✓
East Ayrshire Activity on Prescription	East Ayrshire Council's exercise referral scheme is available to those with medical conditions who would benefit from taking part in physical activity sessions suitable for their needs e.g. falls prevention, weight management, cardiac rehab. Health professionals refer suitable patients to this scheme and a member of the team will then discuss suitable local options to help improve or maintain current fitness levels.			✓			✓	✓



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Invigor8	This programme is aimed at those who have had a fall or are at risk of falling. It includes key components which aid improvements in mobility, strength, endurance, balance and confidence. All participants undergo regular assessments and enjoy the social aspect at the end of each class.	✓	✓	✓				✓
Activator Van	KA Leisure's mobile health information unit which delivers health checks within the 15% most deprived communities of North Ayrshire. Health checks include height, weight, body fat, blood pressure, Body Mass Index and waist circumference as well as other functional health and fitness tests. Staff can deliver health talks, dietary workshops and presentations to various audiences including workplaces and schools.	✓			✓	✓	✓	✓
Active North Ayrshire	North's Ayrshire's exercise referral service, run by KA Leisure. The service provides supported physical activity sessions for people at risk of or recovering from serious illness or conditions include stroke, cardiac disease and musculoskeletal problems. Over 80% of all referrals have a weight management problem along with their core illness or condition. All activities and talks are aimed at weight management as well as condition management.	✓				✓	✓	
Community Learning Disability Team (North)	An exercise class for clients with learning disabilities who have difficulty with their weight.	✓				✓	✓	

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Community Food Workers	Cooking workshops delivered to groups of vulnerable families or to those needing support in terms of healthy eating. Staff from a range of services such as nurseries, children & families teams, and youth workers have been trained to deliver practical cooking sessions.	✓	✓	✓	✓	✓	✓	✓	
Keep Well/ Health and Wellbeing Programme	Delivery of anticipatory cardiovascular health checks to determine an individual's risk of developing cardiovascular disease over the next 10 years. Based on the check, lifestyle modifications are advised and signposting to local services offered.	✓	✓	✓				✓	
Fit Ayrshire Babies/ Play@home	Play@home programme is a series of books for different developmental stages (birth to pre-school) which promote play between a child and their caregiver. The books are given out by Health Visitors.	✓	✓	✓	✓				
Nutritional Requirements for Food and Drink in Schools Regulations	These regulations set out the nutritional standards that must be achieved by local authorities for school lunches and all other food and drinks provided within schools.	✓	✓	✓		✓			
Active Schools	The Active Schools programme is a national programme to encourage increased physical activity, primarily through sport, in primary, secondary and special educational needs schools.	✓	✓	✓		✓			

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Childsmile	The national oral health improvement programme for children. Free dental packs and supervised toothbrushing programmes in nursery, P1 and P2 in priority schools. There is a direct link to healthy eating and the impact on dental health.	✓	✓	✓	✓	✓		
Health Promoting Health Service	The health improvement framework for the NHS. The most recent update was received in January 2012 (CEL 01 2012) and contained within this is a requirement for Health Board areas to make provisions to increase opportunities for physical activity and healthy eating for staff, patients and visitors.	✓	✓	✓	✓	✓	✓	✓
Healthy Working Lives	The health improvement framework for Scottish workplaces which includes specific requirements for healthy eating and physical activity provision.	✓	✓	✓			✓	
Baby Friendly Hospital	Joint programme delivered by the World Health Organisation and UNICEF which encourages maternity hospitals to implement the “Ten Steps to Successful Breastfeeding”. It ensures a high standard of care for pregnant women, mothers and babies.			✓	✓		✓	
Breastfeeding Network	Provides independent advice and support to breastfeeding mothers and those involved in their care.	✓	✓	✓	✓		✓	
CAN (Cheap and Nutritious) Toolkit	A healthy eating toolkit developed originally for use within homeless hostels in Ayrshire and Arran. The resource aims to overcome literacy issues that may exist within this client group and has been rolled out to all homeless hostels in Ayrshire. It is now also used by other services such as learning disabilities.	✓	✓	✓			✓	

Tier 2: Community based weight management programmes

Programme Title	Description	Area			Age Group			
		North	South	East	Early Years	Children and Young People	Adults	Older Adults
JumpStart – Child Healthy Weight Programme	JumpStart is NHS Ayrshire & Arran's child healthy weight programme. It is a group based intervention aimed at children aged 5-15 years who are above the 91 <sup>st</sup> centile. Each of the ten sessions lasts two hours and provides information on healthy eating, physical activity and positive health behaviour change.	✓	✓	✓		✓		
Counterweight	Counterweight is a fully evaluated, lifestyle weight management programme originally delivered by dieticians. Sessions can be delivered on a group or individual basis. The programme is now being delivered by a range of professions within NHS Ayrshire and Arran including cardiac and pulmonary rehabilitation staff, physiotherapists and health and wellbeing advisors.	✓	✓	✓			✓	✓
Achieving a healthy weight (Hepatitis C)	Patients are advised on how to gain or lose weight as necessary before and during Hepatitis C treatment. Patients with other blood borne viruses can also be referred for advice.	✓	✓	✓			✓	
MEND	Mind, Exercise, Nutrition...Do It! Programme which aims to increase physical activity levels, improve healthy eating behaviours and increase self-esteem. Programmes can be targeted at different age ranges although only			✓	✓	✓		

	delivered to children in East Ayrshire.								
Dietetics Service	Individual weight management advice and guidance aiming to educate, motivate and empower the individual, family and carers. The service works across all areas and settings.	✓	✓	✓	✓	✓	✓	✓	✓
Practice Nurse-led weight management	A range of weight management programmes and advice are provided within the GP practice setting. Provision varies within areas.	✓	✓	✓			✓	✓	
Maternal obesity	Pregnant women with a BMI>30 as part of routine care are offered a group session with input from midwife, physiotherapist and community food worker	✓	✓	✓			✓		
Private provider weight management groups	A range of private provider weight management services are delivered across Ayrshire. These include Weight Watchers, Slimming World, Scottish Slimmers and Rosemary Conley Diet and Fitness Clubs	✓	✓	✓			✓	✓	

### Tier 3: Specialist Weight Management Service

As highlighted previously, a specialist weight management service does not exist in Ayrshire at present, however, a proposal for such a service is currently in development.

## **Tier 4: Specialist Surgical Service**

A bariatric surgery service is provided in NHS Ayrshire & Arran by a multidisciplinary team. Referral criteria are based on those recommended by the National Planning Forum:

### Priority group 1

Individuals who are aged between 18-44 with a BMI 35-40 kg/m<sup>2</sup> and recent (less than 5 years) onset of Type 2 diabetes

- Completion of Tier 3 intervention of at least 6 months duration with local programme compliance and completion of required activities e.g. food diaries
- Weight maintenance with additional weight loss of 5kg where possible
- Glycaemic control – HBA1c maintained at <9% on completion of Tier 3 and supportive behaviour change compliance including achievement of locally agreed behavioural goals
- No contraindication to surgery identified.

### Priority group 2

Subject to all Priority 1 patients being offered treatment and local Board agreement, individuals who are aged between 18-44 with a BMI of 40-50 kg/m<sup>2</sup> and onset of Type 2 diabetes of less than 5 years

- Completion of Tier 3 intervention of at least 6 months duration with local programme compliance and completion of required activities e.g. food diaries
- Weight maintenance with additional weight loss of 5kg where possible
- Glycaemic control – HBA1c maintained at <9% on completion of Tier 3 and supportive behaviour change compliance including achievement of locally agreed behavioural goals
- No contraindication to surgery identified.

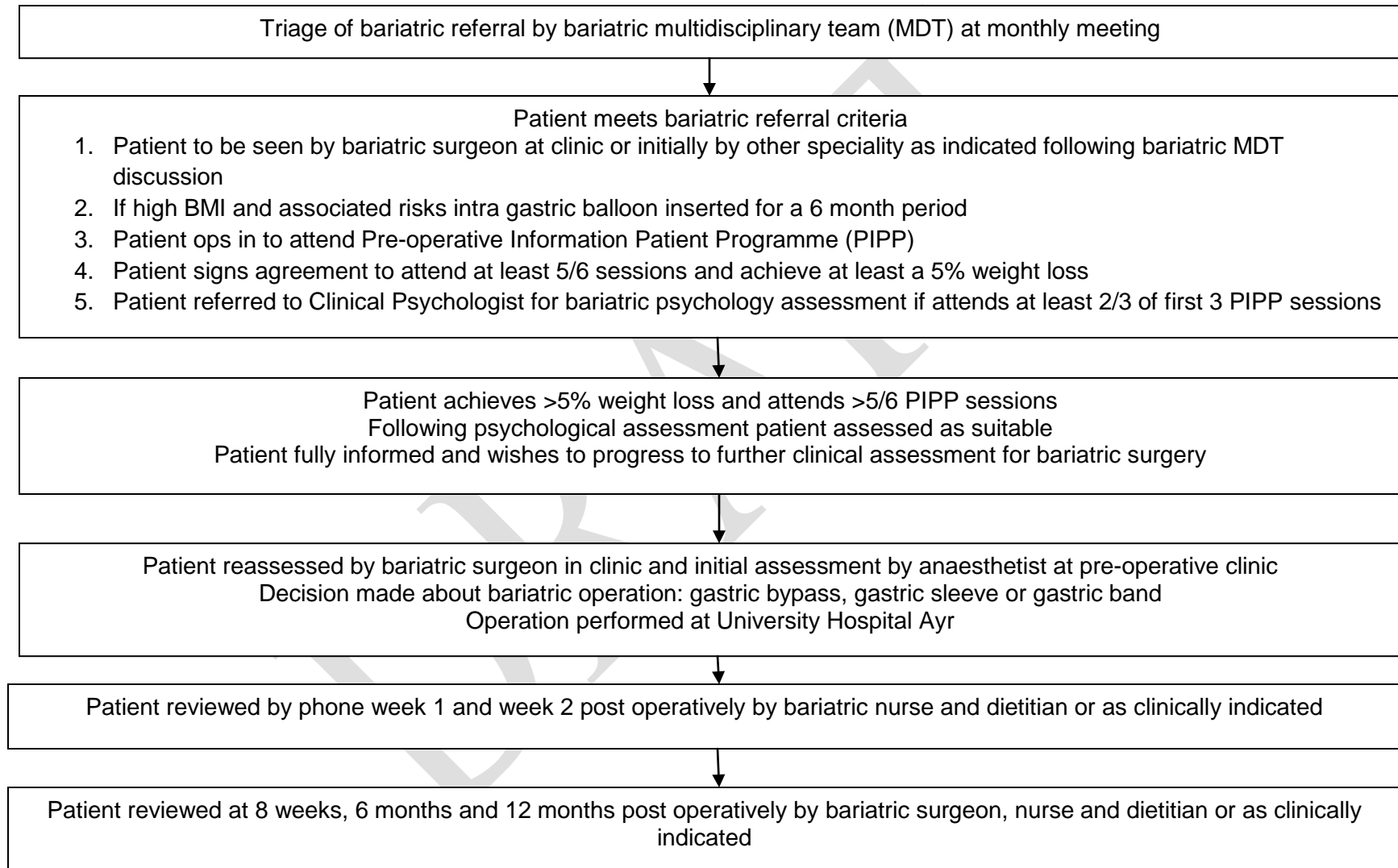
### Individual reviews

Assessment of patients who do not fulfil the criteria agreed by NPF through the use of local Board review panels for individual cases

- Completion of Tier 3 intervention of at least 6 months duration with local programme compliance and completion of required activities e.g. food diaries
- Weight maintenance with additional weight loss of 5kg where possible.

The care pathway for patients referred for bariatric surgery is as follows:

## Bariatric Patient Care Pathway



## **7. Conclusion**

Supporting the population to achieve a healthy weight is a priority, with the health and financial implications of obesity clearly outlined within this document.

Considerable work has been undertaken both nationally and locally in an attempt to stop the current trend in relation to overweight and obesity prevalence; however, there remains a requirement for community planning partners to work together to develop approaches that will achieve the national and local outcomes.

Evidence of the link between deprivation and obesity is considerable. This suggests that to have the biggest impact, strategically there should be a continued focus on providing healthy weight related services for those in the more deprived areas of Ayrshire and Arran.

Promoting healthy weight is a complex challenge: one which requires commitment, expertise, effective practice and strong leadership. These qualities are apparent throughout the partnership agencies. The Ayrshire Healthy Weight Strategy aims to utilise these qualities and work towards reducing levels of overweight and obesity within Ayrshire and supporting maintenance of healthy weight across the population.



## 8. Bibliography

Government Office for Science, 2007. *Foresight – Tackling Obesities: Future Choices – Project report*. Department for Business Innovation & Skills. Available from: <http://www.bis.gov.uk/foresight/our-work/projects/published-projects/tackling-obesities/reports-and-publications>

Information and Statistics Division Scotland, 2013. Primary 1 Body Mass Index (BMI) statistics for school year 2011/12. Edinburgh: NHS National Services Scotland. Available from: <http://www.isdscotland.org/Health-Topics/Child-Health/Child-Weight-and-Growth/>

Modder, J., Fitzsimons, K. J., 2010. *Management of Women with Obesity in Pregnancy. Joint Guideline*. Centre for Maternal and Child Enquiries and the Royal College of Obstetricians and Gynecologists. Available from: <http://www.rcog.org.uk/womens-health/clinical-guidance/management-women-obesity-pregnancy>

Rooney, B. L., Schauburger, C. W., 2002. Excess pregnancy weight gain and long-term obesity: one decade later. *Obstetrics & Gynecology*, 100, 245-252.

Scientific Advisory Committee on Nutrition, 2011. *The Influence of maternal, fetal and child nutrition on the development of chronic disease in later life*. London: The Stationery Office. Available from: [http://www.sacn.gov.uk/reports\\_position\\_statements/reports/the\\_influence\\_of\\_maternal\\_fetal\\_and\\_child\\_nutrition\\_on\\_the\\_development\\_of\\_chronic\\_disease\\_in\\_later\\_life.html](http://www.sacn.gov.uk/reports_position_statements/reports/the_influence_of_maternal_fetal_and_child_nutrition_on_the_development_of_chronic_disease_in_later_life.html)

Scottish Government, 2010. *Preventing Overweight and Obesity in Scotland: A Route Map Towards Healthy Weight*. Edinburgh: Scottish Government. Available from: <http://www.scotland.gov.uk/Topics/Health/Healthy-Living/Healthy-Eating>

Scottish Government, 2012a. *The Scottish Health Survey 2011: Volume 1 – Adults*. Edinburgh: Scottish Government. Available from: <http://www.scotland.gov.uk/Publications/2012/09/7854>

Scottish Government, 2012b. *The Scottish Health Survey 2011: Volume 2 – Children*. Edinburgh: Scottish Government. Available from: <http://www.scotland.gov.uk/Publications/2012/09/3327>

Scottish Intercollegiate Guideline Network, 2010. Guideline 115: Management of Obesity. Edinburgh: SIGN. Available from: <http://www.sign.ac.uk/guidelines/fulltext/115/>