## General Fertility Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>England</th>
<th>Scotland</th>
<th>Shetland</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>72.6</td>
<td>74.0</td>
<td>75.5</td>
</tr>
<tr>
<td>2006</td>
<td>73.2</td>
<td>74.7</td>
<td>76.0</td>
</tr>
<tr>
<td>2007</td>
<td>73.8</td>
<td>75.3</td>
<td>76.5</td>
</tr>
<tr>
<td>2008</td>
<td>74.4</td>
<td>75.9</td>
<td>77.0</td>
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<tr>
<td>2009</td>
<td>75.0</td>
<td>76.5</td>
<td>77.5</td>
</tr>
<tr>
<td>2010</td>
<td>75.6</td>
<td>77.0</td>
<td>78.0</td>
</tr>
</tbody>
</table>

The General Fertility Rate (all live births per 1,000 women aged 15-44) shows a steady increase in Shetland compared to England and Scotland over the years from 2005 to 2010.
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**ANNUAL REPORTS**
1. **MORTALITY**
2. **CONTROL OF INFECTION**
3. **EMERGENCY PLANNING**
4. **IMMUNISATION and VACCINATION** – to follow
5. **SEXUAL HEALTH** – to follow
6. **TOBACCO CONTROL** – to follow
7. **SCREENING**
8. **PUBLIC HEALTH HEAT TARGET PERFORMANCE**
INTRODUCTION

Over the years Public Health Annual Reports in Shetland have aimed to add to our local knowledge and understanding of the health of the people of Shetland. Last year we focused on a number of case studies of issues of inequalities that affect people living in Shetland. This year we are looking more widely at information and information systems, to show in more depth some of the data and statistics that we use to ‘measure’ health and ill-health. But rather than producing a ‘dry’ read of facts and figures, we have tried to explore some of the meaning behind the numbers, and how the statistics available can be interpreted - for better and for worse!

Public Health is concerned with improving the health of the population, rather than treating diseases of individual patients. Management of a patient needs a diagnosis based on a history, examination and investigation. Management of ill health in the community as a whole requires a community diagnosis using epidemiology – rates of illness and investigation of patterns of disease. In the same way that we define health (as opposed to ill-health) as

\[
\text{a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity}\]

so improving health means we need to tackle the wide range of life circumstances that contribute to ill health and to fight the causes of illness as well as illness itself.

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“Politicians use statistics in the same way that a drunk uses lamp-posts – for support rather than illumination”.
Andrew Laing
So, in this report, we look at some of the numbers behind preventable illness, and how we might define health and well-being in the context of mental health. We examine the interpretation of small numbers and how they can mislead, and something of the politics of data – in national policy and in local decision making.

And finally we also publish Annual Reports from the key public health programmes to show activity and progress in the last year.

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*There is no finer investment for any community than putting milk into babies. Healthy citizens are the greatest asset any country can have.*

_Sir Winston Churchill_

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*Statistics :The only science that enables different experts using the same figures to draw different conclusions*. 

_Evan Esar_
1. STATISTICS

Statistics?!!.....

Numbers, percentages, averages, comparisons, trends…. information that is intended to inform “the masses” about various things: alcohol consumption, obesity, smoking etc. We are a society dependent on statistics to tell us what a piece of information really means, and what we should be doing about it. But statistics often trip people up; they are often misunderstood, or difficult to interpret. It is easier to take the statistics at face value, rather than look at how the statistic was arrived at.

Statistics are what drive performance. It is how the health service measures if what it is doing makes a difference. But if some of these figures are misleading and confusing for people, it can have a damaging effect.

Statistics, at first glance, can appear very shocking, e.g. ‘Shetland has the highest obesity rate in the UK’ - but what does this mean – and where does it come from? The Fat Map of Britain was a piece of research published in 2008 by a company called Dr Foster Research and was picked up by many national newspapers who ran the story under various headlines such as “Shetlands head Fat Map of Britain” and including statements such as “Residents of the Shetlands are now the lardiest in the land”.

What does this statistic seem to be telling me?
The actual statistic attached to this headline comes from research funded by the pharmaceutical company Roche, which claimed that 15.5% of Shetlanders were obese, concluding that Shetland was the “fattest” area of the UK.

“There are three kinds of lies: lies, damned lies and statistics”.
Benjamin Disraeli

1 Dr Foster’s ‘fat map’ – http://www.guardian.co.uk/society/2008/aug/28/health.healthandwellbeing
What is this statistic actually telling me?

This statistic claims that Shetland has the highest percentage of obese people in the UK. Other areas in Scotland, like Glasgow, traditionally seen as obesity hotspots, fared much better in this research. What the headline didn’t mention was that this figure, which was taken from national 2007/08 Quality and Outcomes Framework (QOF) data, was based on a sample of only 1000 patients from one GP practice, almost all of whom had recently had their Body Mass Index (BMI) recorded. It is rare for most GP practices to have such complete data recorded about their patients, and as this is a “raw” percentage, calculated using the total practice population, with no adjustment made for how complete the data is, it is not surprising that the Shetland figure is much higher than the rest of Scotland.

So, what does this mean?

Shetland has, in comparison with other areas in Scotland (particularly Glasgow!), a small population. Taking into account that results from only one Shetland GP practice were used in this piece of research, we need to be careful how we interpret this statistic. In urban areas, people with weight problems are far less likely to visit their GP for help. Whereas locally, given high profile campaigns and people being happy to access GP services, it soon becomes apparent how easy it is for a large place like Glasgow’s statistics to be artificially low and Shetland’s much higher in comparison. All the 1,000 patients included in these figures locally see their GP on a regular basis, whereas in more urban areas, people can go much, much longer between appointments.

What we can conclude, with certainty, is that 15.5% of the 1000 patients seen by the one GP practice in Shetland were obese. In fact, this is a good news story, as this figure is actually 11.5% less than the Scottish Health Survey (2008) figure of nearly 27%.

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More recent QOF data (2008/09), covering all 10 GP practices in Shetland, shows Shetland to have an obesity rate of 8.69%, and although this is still above the national QOF figure of 7%, it is almost half the figure quoted in the Dr Foster research and not close to being the highest in Britain or significantly higher than other Scottish Board areas. It may well mean that Shetland GPs are good at being in contact with patients, and at identifying people with weight problems.

**So what’s the conclusion?**

Don’t believe everything you read! Below is a list of questions to ask of any statistics, then you can make up your own mind.

- Is the question relevant in the first place?
- Where does the data come from? Is it from a reliable/unbiased source?
- Is the data presented in context? A million dollars sounds like a lot of money to someone who makes an average salary, but it’s a drop in the ocean to Bill Gates. Presenters often quote statistics without benchmarks, so the audience doesn’t know how to evaluate them.
- Has the data been interpreted correctly?
- How sure are we? Are results statistically significant? Statisticians use standard levels of how unlikely something is to have happened by chance alone. By quoting these, the audience can see how reliable the research is.
- What data is reported? Is it just the best or just the worst to make headlines, for example?
- Is ‘causation’ confused with ‘correlation’? It is important to realise that just because two things occur together (correlation), it does not automatically mean that one caused the other (causation), even if it seems to make sense.

A good example of how the reporting of health related information nationally can be extremely influential, in a negative sense, is the hype that was caused over the reporting of a link between autism and MMR in a research paper. The claim was based
on a study of only 12 children. The study was later proven to be biased and the results of it were not applicable to the general population of children in the UK, but the general public were so taken up with the headline grabbing suspected link between the MMR jab and autism that little attention was paid to the credibility of the research. Since the claim, the research paper has been taken out of publication and the published evidence overwhelmingly shows that there is no proven link between MMR vaccination and autism. Further studies have shown that the rate of MMR vaccination has decreased whilst the rate of measles has increased, due to all the associated worry and controversy that the research caused. There were 54 confirmed cases of measles in Scotland in 2008, which mainly occurred in people who were not immunised\(^3\). This is a relatively high number compared with previous years when between 5 and 15 cases are normally seen. Although the MMR and autism story came out a number of years ago, the knock-on effect that this claim had still reverberates today, with MMR vaccination rates still below the optimum level, though they have been showing a steady increase over recent years.

\(^3\) Health Protection Scotland
Reliable statistics, based on sound research, from reputable sources, are the ones that the public should be made aware of, but often these aren’t the ones that are reported because they don’t make the attention grabbing headlines.Luckily, in medical research, unsubstantiated scare stories very rarely appear in reputable scientific publications, and we hope that those that appear in the general media do not get taken seriously enough, by enough people, to do widespread harm. If in doubt, check with your local Public Health Department!
2. HEALTH IMPROVEMENT – saving lives

How many lives can we save through health improvement?

Intensive care, brain surgery, heart transplants...... high tech, very specialised medical and surgical care and procedures that save lives. But how many lives can we save through health improvement? Compared to medicine and surgery, health improvement looks very low key, low tech. Surely handing out a few leaflets and running poster campaigns can’t really make any difference?

Health improvement is much more than leaflets and posters though, and focuses on trying to help people change behaviour that might affect their health in the future. It can work at an individual level, like other healthcare interventions, but can also work on a population level. It is about prevention and saving lives in the future rather than today.

Smoking is a good example of how health improvement can save lives. Helping people to stop smoking is a key responsibility for the health improvement team in Shetland, working with other agencies. Research has shown that about 17 out of every hundred deaths due to heart disease are due to smoking. That means if no one smoked, then instead of seeing 100 deaths, we would see 83. That is 17 lives saved.

Between 1999 and 2008 almost 500 people in Shetland died of heart disease, about 50 a year. So if we carried on smoking at the same rate, then we could predict that every two years about 100 people would die. But if not one smoked, there would be 17 less deaths. Only 83 people would die every two years. 170 lives saved over a ten year period.

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2 Information and Statistics Division NHSScotland website: [www.isdscotland.org](http://www.isdscotland.org)
Clearly things are not quite as simple as that and lots of other factors come into play. We all know about people who smoked who lived to be 100 and those who never smoked but died at a young age. And of course we all have to die of something – but smoking increases the risk of dying earlier than you should, all other things being equal. Half of all long term smokers die early; one quarter of all long term smokers die before they reach the age of 70 losing on average 21 years of life.\(^3\) When we are thinking about the whole population then these are the sort of numbers that make us believe that it is worthwhile helping people to stop smoking. And of course, the best thing we can do is to prevent folk from starting smoking in the first place.

This is where health improvement comes in. In Shetland the health improvement team work with GP practices, community pharmacies, schools, workplaces and people in other settings to help people stop smoking. We run smoking cessation clinics with both group and one to one sessions. Since April 2008, through these services and work with partners, we have directly helped nearly 200 people in Shetland to stop smoking for at least a month. Of course things do not work perfectly. Many people

stop for a short time, and start again. We know that on average it takes seven or eight attempts to stop smoking. But every time someone quits, even if they relapse, they are moving nearer to the time when they can stop completely and reduce their risk of dying of heart disease, along with cancer, lung disease and other illnesses. We work with a lot of clients who find it extremely difficult to quit – but through perseverance of the client and the smoking cessation team, many have managed to cut down a lot. Even if they have not yet stopped, they are reducing the risk by cutting down and gradually moving towards the day when they can hopefully stop.

That is just one aspect of health improvement work on tackling smoking. We work with schools and youth groups to help children and young people to understand the dangers of smoking and equip them with skills to avoid taking up smoking. We know that many teenagers and young people will try smoking – experimenting is one of the functions of being a teenager. But we can support young people to minimise the risks, help them prevent a one off cigarette at a party become a lifelong addiction.

Weight management and prevention of obesity is another area where health improvement work can prevent illness and ultimately save lives. Like smoking, obesity is a cause of heart problems. Looking at heart attacks, 18% are attributed to obesity.\(^4\) So, if there was no obesity, then instead of 100 heart attacks you would see 82. In Shetland there were over 450 heart attacks between 1999-2008, about 45 each year. So if there was no obesity in Shetland, then instead of 45 heart attacks every year we would see about 37. That is eight less heart attacks annually.

Heart attacks are not the only problem that can be caused by obesity. The table on the next page shows the proportion of all cases of diabetes, high blood pressure, and some cancers that are caused by obesity in Scotland.

\(^4\) Adapted from Grant I, Fischbacher C and Whyte, B. *Obesity in Scotland; an epidemiological briefing.* ScotPHO 2007. Available at: www.scotpho.org.uk/nmsruntime/saveasdialog.asp?lID=4048&sID=3489
The prevalence of obesity and related diseases and the number of people who have each condition as a result of obesity

<table>
<thead>
<tr>
<th>Disease</th>
<th>Estimated number in Scotland annual incidence/prevalence</th>
<th>Estimated proportion attributable to obesity</th>
<th>Estimated number in Scotland attributable to obesity (2003)</th>
<th>Estimated number in Shetland attributable to obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>High blood pressure</td>
<td>1,329,696 (p)</td>
<td>36%</td>
<td>478,691</td>
<td>1232</td>
</tr>
<tr>
<td>Angina</td>
<td>250,344 (p)</td>
<td>15%</td>
<td>37,552</td>
<td>122</td>
</tr>
<tr>
<td>Heart attack</td>
<td>135,432 (p)</td>
<td>18%</td>
<td>24,378</td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>92,340 (p)</td>
<td>6%</td>
<td>5,540</td>
<td>20</td>
</tr>
<tr>
<td>Type 2 diabetes</td>
<td>73,872 (p)</td>
<td>47%</td>
<td>34,720</td>
<td>372</td>
</tr>
<tr>
<td>Colon (bowel) cancer</td>
<td>2,242 (i)</td>
<td>29%</td>
<td>650</td>
<td>3</td>
</tr>
<tr>
<td>Ovarian cancer</td>
<td>616 (i)</td>
<td>13%</td>
<td>80</td>
<td>1</td>
</tr>
<tr>
<td>Cancer of the Uterus (womb)</td>
<td>449 (i)</td>
<td>14%</td>
<td>63</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>118,500 (p)</td>
<td>12%</td>
<td>14,220</td>
<td>61</td>
</tr>
<tr>
<td>Gout</td>
<td>20,150 (p)</td>
<td>47%</td>
<td>9,470</td>
<td>40</td>
</tr>
<tr>
<td>Gallstones</td>
<td>11,350 (p)</td>
<td>15%</td>
<td>1,702</td>
<td>7</td>
</tr>
</tbody>
</table>

(p) = prevalence, or the number of cases at any one point in time
(i) = incidence, or the number of new cases each year

Tackling obesity is a key area for health improvement. So as with smoking we work on helping folk to prevent obesity in the first place (through promoting and supporting

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5 QOF database. Available at: [www.gpcontract.co.uk/pct.php?orgcode=Z&year=9](http://www.gpcontract.co.uk/pct.php?orgcode=Z&year=9)

breastfeeding, healthy eating and physical activity campaigns, work with Active Schools and child healthy weight programmes for example) as well as helping them lose weight (for example the Counterweight programme in primary care).

Health risks: beliefs and behaviours

Looking at these sort of population figures it is quite clear that tackling behaviours that affect health can reduce illness and premature death within a population. However the difficulty in making this work in practice is that for many people, they do not always associate what they are doing now with the risk of future health problems. There is often a belief that it will happen to someone else, not them. And the reality is that of course not everyone who smokes will become ill as a result. We can’t really predict very well, out of those people who do smoke, which ones will become ill and which ones will not. However, for some health behaviours we can make a more sophisticated judgement about the risk to an individual. For example, we know that the risks due to being obese increase the more overweight an individual becomes. For many health risks, it is the combination of different behaviours and factors that increase the risk: for example the risk of heart disease increase with age and with the number of other risk factors that an individual has such as smoking, high cholesterol, high blood pressure, obesity and family history. Some of these factors can be changed and some cannot.

In terms of health, the beliefs that people have about risks, and the risks that people are prepared to take vary between individuals and are influenced by a number of factors. These include the characteristic of the threat or risk itself, an individual's own
risk taking behaviour and their own personal circumstances. The way in which an individual responds to risk is very complex and everyone has a different perception of risk. Some people tend to be ‘risk takers’ in terms of their behaviour. Other people are ‘risk averse’ and tend not to take part in obviously risky behaviour. Threats that are unfamiliar, exotic, involuntary and ‘man made’ are often seen as more of a health risk than those that are familiar, domestic, voluntary and ‘natural’. So people often worry less about the potential health effect of, for example, smoking and excess alcohol (familiar, domestic and a voluntary element) than the potential health effects of terrorism or nuclear accident (unfamiliar, involuntary and man made) or bird flu (unfamiliar, exotic and involuntary). Threats against children tend to be seen as more serious and if an individual has previous experience of a particular threat, then they may see it as more risky.

Behaviour related to vaccinations demonstrates how complex perceptions of risk affect behaviour. At a population level, the risk of any side effects from vaccines is far, far less than the risk from the diseases that they protect against. However, some people believe that it is better to have a ‘natural’ illness such as measles than to have an artificial, man-made vaccine. There are also different beliefs around different vaccines. The uptake of vaccination against a bug called Neisseria meningitides serogroup c (‘Men C’) has been good since it was introduced in 1999. Before then, severe illnesses such as meningitis and septicaemia caused by this bug were not uncommon. Men C tends to attract a lot of media attention and cause great anxiety amongst parents because babies and children can become very sick, very quickly. About 10% of those affected die; many are left with severe disabilities. In the 1990s there were outbreaks in schools and universities. So the public welcomed the introduction of the vaccine to prevent a very serious and frightening illness. This is in contrast to MMR (measles, mumps and rubella vaccine). As described in the chapter on Statistics, public confidence in MMR dropped as a result of misinterpreted research results. Also measles, mumps and rubella are not seen as serious illnesses by many people (in contrast to Men C). This is partly because older people may remember them as mild ‘childhood illnesses’; and partly because we now no longer see many deaths
or complications due to the success of the vaccination campaign when first introduced in the 1980s.

The concept of ‘lay epidemiology’ describes how individuals make a judgement about health risks. \(^7\) People take in information from a wide variety of sources, including the media, health promotion materials, healthcare professionals, family, personal networks and personal experience. They form a judgement about the risk of a particular behaviour or exposure based on all this information, which is not necessarily the same as the ‘official’ or scientific perception. This can mean that the beliefs that individuals (or families or communities) hold, and their behaviours can seem irrational in the face of ‘scientific’ evidence. So people may worry as much about a (less than) one in a

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The recent swine flu pandemic (caused by influenza A H1N1v) is an interesting example of how different people hold different beliefs, and of how difficult it is to communicate information about risk to the public. One of the problems with the pandemic was that initially the scientific information was based on predictions, and as it turned out the predictions overestimated the threat of swine flu for many people and many communities, including Shetland. However for some individuals, groups and communities the risk was very real: people did die, and some were previously healthy young individuals including pregnant women. In terms of communicating with the public, public health professionals had a very difficult job to do: on the one hand we wanted to encourage those individuals who were thought to be at a higher risk of complications from swine flu to take up the offer of a vaccination to protect themselves (including pregnant women). On the other hand we did not want people to overreact. For the majority of people who did catch swine flu, it was much the same as catching seasonal flu in any other year. We had a good uptake of the vaccine, so many people did believe that there was some risk to themselves due to swine flu. This was despite the fact that we had very few cases in Shetland and so most people probably did not have personal experience of the illness. However, what we do not know is to what extent the vaccination programme (and other measures such as promotion of good hygiene) prevented cases of swine flu in Shetland.

than) one in 1000 chance of smoking killing you if you are a smoker.
The ‘prevention paradox’

Public health and health improvement professionals generally work at a population level when interpreting and communicating risk to the general public. We run population wide campaigns, and offer universal advice and health improvement messages. However, it is clear that not only do risks vary between different groups of people and individuals but perception of risk also varies. Does this mean that health improvement should just focus on those individuals with the highest risk? Is this the way to save the most lives?

It would seem that focusing on those individuals most at risk would be the most effective use of resources. And this is often how we do approach behaviour change on an individual level. So for example, the Counterweight programme in primary care is only available to patients who are obese (as defined by a Body Mass index of 30 or more). Patient who are overweight, but not obese cannot access this service.

However if we look at the whole population, then we see that for many conditions there are often a very small number of people who are at high risk, but a very large number who are at a moderate risk and a smaller number at low risk. Even though the large group in the middle only have a moderate risk, because there are so many of them, this is the group where we see the most cases of illness.

For example: if, in a population, 10 people have a 50% chance of developing an illness (a high risk), then it can be predicted that five people will develop it. And if, in the same population 100 people have a moderate risk of 10% then it can be predicted that a further 10 people will develop the illness. So more people in the moderate risk group will develop the illness compared to the high risk group.

If we want to prevent this illness through changing behaviour, then we can concentrate our efforts on the 10 people at high risk, and aim to prevent five cases of illness. Or
we can focus on the 100 people in the moderate risk group, and aim to prevent 10 cases. However, how likely are people in the moderate risk group to change behaviour? For 90 people in that group, changing their behaviour will make no difference to them as individuals. This is the prevention paradox as described by the epidemiologist Rose: for one person to benefit then many have to change behaviour with no benefit to themselves.

So in terms of health improvement programmes, we have to weigh up the advantages and disadvantages of a targeted, high risk, individual approach which can only have a limited effect on reducing overall numbers of illness and deaths; versus a population approach which could potentially yield a greater reduction in overall numbers of illness and death. But this approach relies on many individuals changing behaviour when for most of them it makes no difference to their eventual health outcome.

In reality, we use both approaches. We run population based campaigns aimed at encouraging everyone to change their behaviour alongside programmes to actively support individuals to change their behaviour. So we run healthy eating and physical activity campaigns to encourage everyone to maintain a healthy weight, or lose weight if they need to, alongside weight management programmes for individuals. If we could help the most obese people in Shetland to lose weight then for most of them, their health would be improved and obesity related illness prevented, and it would make a small difference to our overall figures for conditions such as type 2 diabetes. If however, we could move everyone in Shetland nearer to a healthy weight (which for most means losing some weight) then we would prevent a huge number of cases of obesity related disease. If we had no obesity, then we would half the number of cases of type 2 diabetes, from nearly 800 to about 430: reduce bowel cancer by almost a third from about 11 to 7 and reduce the number of people with high blood pressure by a third (from nearly 3500 to 2300). The challenge is in how we persuade people to change behaviour when they do not perceive any risk to themselves. And in fact the figures show that, for most of them, it will make no difference to their future health.
But, on a population level, the effects can be huge and we can save lives through health improvement.
3. DEMOGRAPHICS AND POPULATION CHANGE

Introduction

Demography is the statistical study of human populations. It focuses particularly on the size, structure and distribution of populations and the effects that changing rates of fertility (births), mortality (deaths) and migration have on them.

Encouraging more people to live and work in Shetland is essential for sustaining communities and the economy in the long-term. This is recognised by the Community Planning Board in the target they have set of increasing the population to 25,000 by 2025. Many feel this is unrealistic, as Shetland has not seen numbers this high since the peak of the oil industry, and it is felt unlikely that a development on this scale will be seen in Shetland again in the foreseeable future. Historically the population of Shetland has fluctuated significantly from a high point of around 30,000 to its lowest level of 17,000, but it has remained relatively steady at between 22 and 23,000 over the past 25 years.

Fertility

When making estimates about how a population might change over time, assumptions are made based on past trends. In contrast to the Scottish trend in general, Shetland’s birth (fertility) rate has been consistently higher than the death rate\(^1\). As can be seen from the graph on the next page, since 2005 the fertility rate in Shetland has risen from 54.9 to 69.6 – an increase of over 25% which is much higher than most other Board areas and the national average. The fertility rates used in population projections are based on assumptions about the average family size. It has been assumed that the average completed family size nationally will continue to decline from around 1.85 children per woman for women born in the early 1960s and now reaching the end of their childbearing lives, before leveling off at 1.70 for those born in the 1990s and later.

\(^1\) The general fertility rate is the number of babies born per 1000 women of child bearing age (15 – 44)
Demographics and Population Change

General Register Office for Scotland (GROS)\(^2\)

Mortality and life expectancy

Nationally produced mortality data shows that in recent years, mortality from cancer has reduced steadily for both men and women in Scotland, with Shetland following a very similar trend\(^3\). As the graph below shows, cancer, heart disease and stroke mortality all show a reducing trend, with quite sharp reductions over the past 10 years in cancer and heart disease. Based on these rates, Scottish life expectancy at birth is projected to increase from 74.8 in 2007 to 80.7 in 2033 for males; and from 79.8 in 2007 to 85.3 in 2033 for females. Shetland people are predicted to live even longer than the national average. However it is also predicted that we will have an ageing population, with fewer

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\(^2\) GROS www.gro-scotland.gov.uk

\(^3\) Mortality (deaths) is often reported using standardised mortality rates. This means that the figures are expressed as a rate per 100,000 and that the figures are ‘standardised’ to take into account factors such as the age and sex of the population. Using standardised mortality rates means that the numbers of deaths in different sized and aged populations can be compared.
people of working age, which will be a challenge to local health and care services when trying to provide services.

Information and Statistics Division (ISD)\(^4\)

Migration

The effects of people moving into and out of an area also has a big impact on the population. Shetland has recently been showing a net out-migration, ie more people leaving than moving to the islands, which goes against the national trend. The decrease in the population of those aged between 20 and 44 years in Shetland is mainly being caused by young people leaving Shetland to seek higher education and better job opportunities. Again, this contributes to the projections of an ageing population in the future.

Birth rates and death rates are fairly predictable characteristics of a population in the developed world. But migration is largely driven by economic and social opportunities and is susceptible to broader changes, even over the short-term. In Shetland, short-
Demographics and Population Change

term population growth has been linked to economic factors such as the growth in the fishing industry and Sullom Voe oil terminal development. Similarly, the decreases can be linked to economic downturns.

Trends

The trends which are likely to influence population change in Shetland in the medium term are a continuing flow of people moving to Shetland who are attracted by the natural environment and safe communities. However, there is also likely to be decline in the numbers of Eastern European migrant workers coming to Shetland as government policy is likely to make it more difficult for people from other countries to live and work in the UK.

It is estimated that, in the next 25 years, the number of islanders of pensionable age will almost double (89.8% increase), while the working-age population will decrease by 26.8%\(^6\). This is mainly due to the effects of increasing life expectancy, older people moving to Shetland for an improved quality of life as well as more young people leaving the islands.

\(^5\) bbc.co.uk/news
\(^6\) GROS, 2006-base population projections
The ageing population is a considerable challenge for the area, as communities with a large proportion of people over retirement age tend to generate lower levels of economic activity and, indeed, the confidence of communities and the sustainability of services can be negatively affected. In order to meet the target of an increasing population, these trends need to be reversed by attracting younger, economically active people to the islands. This is difficult to do in sufficient numbers without large scale opportunities which are created by big business. It is also important to think more creatively about how older people might contribute economically and socially to the islands. Encouraging them to participate in volunteer work and other community projects, although not directly creating economic wealth, will contribute to the overall wellbeing of the community. This will also help older people as individuals to stay mentally, socially and physically fit and active and would help meet some of the challenges of caring for an elderly population.

“Life is not just to be alive, but to be well”.

Marcus Valerius Martiahs
Improving mental health and well being is a national priority in Scotland. Mental health is a very complex area that is made up of all sorts of factors and is more than diagnosed mental illness. The idea of mental health and wellbeing includes how we are feeling, how well we cope with problems, our relationships with other people and satisfaction with life in general.

We recognise that our mental state is shaped by both the social, economic, physical and cultural environment; and our own personal strengths and vulnerabilities, lifestyles and health related behaviours.

If we take all these factors into account, it becomes very difficult to define what we mean by ‘mental health’ and different people have different ideas.

However, if it is difficult to define what mental health is, how do we know if it is improving? How can we measure mental health in the Shetland community, and how do we know whether the things that we are doing are making any difference?

To work out whether we are making any progress, we need to look at the individual components which make up, or have an impact on mental health. We have to be able to clearly define /and describe these components in such a way that they can be measured or counted: we then call them indicators. The Scottish Public Health Observatory has come up with 54 indicators which can be used to monitor the state of mental health in Scotland. They have been split up into four groups of similar indicators. They include:

- ‘High level’ indicators (common diagnosed mental health problems, suicide)
- Individual indicators (adult learning, physical activity, healthy eating)
- Community indicators (involvement in local community, home safety)
Mental Health – making sense of the numbers

- Structural indicators (worklessness, education, financial management, financial inclusion, and neighbourhood satisfaction)\(^1\)

The Government aim is to ‘reduce the burden of mental health problems and mental illness and to promote good mental wellbeing’ in Scotland.

This is measured by using the indicators described, and targets are set for each of the different indicators. At a local level, individual NHS Boards have been given local targets which will contribute to the overall goal.

We are asked to meet the following targets:

1. Reduce suicide rate between 2002 and 2013 by 20%.

There are a number of problems with this measure:

- Because we are a small population, the actual number of suicides in Shetland is very small.
- Because the numbers are small, one or two incidents makes a big difference to the rate of suicide, which is measured per 100,000 population.
- With this sort of fluctuation from year to year it is difficult to decide on what the baseline rate should be: there may be a 20% change in the rate just because of expected year to year variation.
- Also because numbers are small, setting a percentage target means you can end up with a target of a ‘fraction’ of a person – one and a half people for example.

Clearly a large place such as Glasgow would expect to see many more suicides than a small place like Shetland. Rates are used because then we can see if there is a

\(^1\) ScotPHO (2009) Scotland’s Mental Health and its context: Adults 2009 - Briefing
difference in the number of suicides regardless of the actual size of the population. But the problem is that with small numbers, even a small increase in actual numbers can make a big difference in the rate. Five extra suicides in Glasgow would make very little difference to the rate there, but five in Shetland would make a huge difference.

The graph below shows that since 2001, our numbers of suicides have varied between two people per year and seven people per year; but the rate per 100,000 has varied between 0.09 and 32.01 per 100,000.

General Register Office for Scotland\(^2\)

With such small numbers, that vary from year to year, it is very difficult to identify what our starting point is, and so what a 20% reduction would look like. If we take the starting point as 2002 when there were 6 suicides and a rate of 27.35, then a 20% reduction would be down to five ‘and a bit’ suicides or a rate of 21.88. So as soon as the number of suicides drops to 5 or under then we have reached the target, even if this was due to

\(^2\) www.gro-scotland.gov.uk
natural variation and nothing to do with actually preventing suicides. Of course, we then have a problem if, due to natural variation again, the number increases back up to six the following year.

We can work with the figures to try and make them more meaningful. One way is to increase the numbers of events that we are looking at by increasing the time periods that we work with. For example we could count up all the suicides over a three year period (say 1999-2002), and then aim for a 20% reduction in the total number for three years for the period 2010-2013.

A problem with this method it that you could only get information every three years, which then makes it difficult to know if we are making progress. This can be overcome by using ‘rolling averages’. If we were to look at the three year rolling average in the rate of suicide for 2002, this would be the average rate per year for the period 2001-2003. The three year rolling average for 2003 would be the average rate per year for the period 2002 – 2004 and so on. Of course the problem with this is that you will always be a year out of date because you have to wait for another year’s worth of figures to calculate a rolling average.

But of course, each number, each suicide, is a real person and even one suicide is a tragedy. Ultimately the aim is to reduce the number of suicides by prevention. Where there are big numbers, then it is possible to look at what sort of common factors might be contributing to this. For example, if it is found in one area that 80% of the people who died through suicide were people who were homeless, then that would give a focus for preventative work.

In Shetland, because our numbers are small it is very difficult to identify these sorts of common themes. However we now have a system in place for audit of all sudden deaths, including suicides, which aims to consider each individual case and identify if there are any local factors and preventable issues that can be targeted.
2. **Reduce the rate of increase in antidepressant prescribing**

Antidepressants are drugs used to treat depression, and occasionally other medical conditions. Over recent years, there has been an increase in the amount of antidepressants being prescribed. This could be due to a number of factors: more people being diagnosed with depression; people staying on the medication for longer or people being prescribed higher doses or combinations of drugs. For many people, antidepressants are entirely appropriate and can be life saving. However, for others it may be more appropriate to be referred for a psychological therapy (‘talking therapies’), or to take a lower dose of tablets, or to take them for a shorter length of time. The aim is now to try to increase the use of other therapies and be less reliant on antidepressants. So the target was designed to encourage GPs and other health professionals not to automatically prescribe antidepressants for depression, but to consider other options – the aim being that usage of antidepressants would reach a high point and level off rather than continue to increase year on year.

There are a number of ways in which the ‘amount’ of antidepressants can be measured. Using the total number of tablets, or weight, or packets is not helpful because there are many types of antidepressant, different tablet strengths, packaging and preparations. However for most drugs there is a usual ‘daily dose’, so we can count the number of daily doses regardless of the type and preparation of the drug. Again, it is not useful to look at total numbers of doses because this will vary with the size of the population, so the measure used is ‘Daily Drug Doses (DDDs) per head of population’.
Prescribing Information Systems Data warehouse (ISD)\(^3\)

Notes:
1. Number of anti-depressant DDDs per capita (aged 15 and over). Based on GRO mid-year population estimates for 2006.
2. Number of anti-depressant DDDs per capita in year ending March 2010 is to be less than or equal to the number of anti-depressant DDDs per capita in year ending December 2009.

Although Shetland continues to have the lowest level of anti-depressant prescribing in Scotland, we do have a steady increase in the amount of drugs being prescribed along with the rest of Scotland.

Whilst Shetland’s figures mirror the Scottish trend, the percentage increase has been above average since June 2008. This means that the amount of antidepressants being prescribed is not only increasing, but increasing more and more each year which is the complete opposite of the target we were set.

There are several potential reasons for this. In Shetland we started at a low level; our baseline prescribing rate was probably too low and the increase in prescribing probably represents more people being appropriately diagnosed with depression; and an

\(^3\) www.isdscotland.org
improvement in appropriate prescribing for both depression and other conditions that antidepressants can be used to treat (such as chronic and neuropathic pain).

Local mental health promotion activities have taken place over recent years which aim to increase awareness of mental health issues and reduce stigma. This in turn can increase the number of people who are seeking help for depression and other mental health problems, and also increase the number who are willing to consider a pharmacological intervention (a drug) for their difficulties. From this perspective, our improvement activities may be contributing to a rise in the detection and appropriate treatment of depression. Therefore it may be difficult to achieve a reduction in our prescribing figures over the next year or so.

We also need to be careful in interpreting the trends in our data – for example the antidepressant prescribing data from two practices in Shetland shows a significant difference from one month to the next – this is a result of the fact that some practices dispense on a 2 monthly cycle rather than a 28 day cycle. In the very small practices, when we are looking at trends using percentages, the addition or discontinuation of one or two patients will have a significant impact.

Contextual community Indicators

We have some well-established tools for measuring some of the indicators e.g. depression, anxiety, alcohol dependency. It is harder to measure those indicators which are described as ‘contextual community’ indicators e.g. social contact, social support, what impact the perception of local crime has on mental health, or people’s ability to influence local decisions. In fact, there are some indicators which we do not yet have any measures for e.g. spirituality, attitudes to violence.

In Shetland, the Community Planning Partnership carries out the Your Voice Survey every year, which aims to capture some of these factors by asking people within the community what they think about opportunities to become involved in the community, access to education, public transport, shops, leisure and recreation, many of the community factors which contribute to good mental health.

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4 Personal Communication, Mental Health Services Manager, NHS Shetland 2010
Overall the indicators suggest that mental health in Scotland has stayed fairly stable over the last decade. Some factors have improved, but these are 'cancelled out' by the others that are getting worse.

What has improved over the last 10 years?

- Common mental health problems
- Physical activity & healthy eating
- Home safety
- Financial inclusion

What has worsened over the last 10 years?

- Alcohol dependency
- House condition
- Overcrowding
- Drug-related deaths

The diagram below is taken from ‘Towards a Mentally Flourishing Scotland’ which is the policy document which currently guides mental health improvement work in Scotland\(^5\). It is designed to link activities with short-term, intermediate and long-term outcomes and help us to focus the work that we do. So, for example, we know that taking regular exercise can help to keep us mentally healthy, so an action that makes it easier to take regular exercise by creating access paths, would play a part in improving the physical and social environment, which in turn would lead to more healthy behaviours, which leads to better mental health in the long term.

\[^5\] http://www.scotland.gov.uk/Publications/2009/05/06154655/5

*The scientific truth may be put quite briefly; eat moderately, having an ordinary mixed diet, and don't worry.*

*Robert Hutchison, 1932*
Mental Health – making sense of the numbers

This diagram illustrates how data, information and indicators need to be as sophisticated as the subject matter. Having a framework such as this helps us to make sense of complex subjects, complex information, inter-relations and information; it helps us to plan interventions which target elements of a complex system and make an impact on specific strands without losing sight of the bigger picture.
5. WELL NORTH and NUMBERS

What is Well North?

Well North is aimed at reducing some of the inequalities that exist in meeting our health needs in Shetland - in other words making sure that everyone is fairly and equally well treated when it comes to health care. Phase 1 of the Well North pilot (2009-10) was in Unst and Fair Isle focusing on the health equality challenges of remote and rural areas. Phase 2 (2010-11) is being applied to areas in Shetland where people can be identified as being more likely to be disadvantaged according to national data.

In very general terms people living in poorer areas tend to have greater health care needs but access health care services less often than people living in better off areas. The aim of Well North is to help people living in disadvantaged areas to improve their general health, by offering health checks along with support and encouragement to attend. And to assist them to get healthy and stay healthy by making a few simple lifestyle choices. By making access to these checks easier the idea is that more people will have their needs met, and early signs of ill health will be identified, and people will be referred more appropriately into existing services.

How do we decide what is a ‘disadvantaged area’ in the first place?

Well North is using information from the Scottish Index of Multiple Deprivation (SIMD) to identify the geographical areas in Shetland which are deprived in a number of key areas for life\(^1\). The SIMD calls these seven key areas **domains**. The domains are: current income, employment, health, education, geographic access, crime and housing. Areas are scored on facts such as, how many people are employed in the area and the quality of housing that is available in the area. This is a way of describing things using numbers to try to help us understand them better.

\(^1\) SIMD website: [http://simd.scotland.gov.uk](http://simd.scotland.gov.uk)
As we know, there are often better off and less well off people living side by side - so this data only gives us a rough guide as to the make-up of the population of the area. There are 6505 data zones in Scotland and 30 in Shetland.

In Shetland the most deprived data zone, according to the SIMD rankings is Lerwick North (data zone S01005507 – see Figure 1 on page 37) with a ranking of 2,084. Other data zone areas in Lerwick are also shown on the map.

According to the overall rankings the SIMD data shows us that Shetland is relatively well off compared to other areas of Scotland. However within Shetland itself there is a range of data zones with some areas more disadvantaged than others. Well North aims to tailor resources and health care support into those data zones that come at the top of the list in order to support those people with unmet health needs. We also know that many people living in these areas access fewer health services and Well North aims to improve this uptake.
The Health Domain

The Health Domain is made up of seven categories which together give an indication of the health of the population in each data zone. These include:

- Standardised Mortality Ratio – number of deaths (from all causes)
- Hospital episodes related to alcohol use - admissions to acute hospitals with a diagnosis of alcohol related conditions
- Hospital episodes related to drug use - admissions to acute hospitals with a diagnosis of drugs misuse conditions
- Comparative Illness Factor - combined count of recipients of the following benefits: Disability Living Allowance (DLA); Attendance Allowance (AA); Incapacity Benefit (IB) (not also receiving DLA); and Severe Disablement Allowance (SDA).
- Emergency admissions to hospital - emergency hospital admissions for patients treated as inpatients or day cases
- Estimated proportion of population being prescribed drugs for anxiety, depression or psychosis - patients being prescribed anxiolytic, antipsychotic or antidepressant drugs
- Proportion of live singleton births of low birth weight - (less than 2,500 grams)
Well North and Numbers

(For more information about data zones throughout Shetland please visit the Scottish Index of Multiple Deprivation website at http://simd.scotland.gov.uk and click on Shetland Islands)

Figure 1: Map showing outlines of data zones in Lerwick
A closer look at the Health Domain – a breakdown of figures for all the data zones in Shetland

- The table on the next page lists the 30 data zones in Shetland and gives relative values of measurements of health. This means these figures are used to compare zones one with another. It can be seen that the zones marked in red, the three areas identified as being the most disadvantaged in Shetland on the overall rankings, show high figures in this health domain breakdown. This is particularly noticeable in the figures for hospital episodes related to alcohol and drug use and the standardized mortality ratio. This suggests evidence of links between preventable death and deprivation and can be used to support the case for more resources to be tailored to these areas to help people live longer.
Figure 2: Table showing figures for the Health Domain throughout Shetland

The first step in trying to reduce inequalities in these areas is to identify the people who have not been accessing existing health services. We are doing that by finding people registered with Lerwick Health centre who do not have complete up to date information in their records e.g. a blood pressure measurement, recording of smoking status. These folk are then invited to attend at the Lerwick Health Centre for a Well North
Health check. These invitations will encourage people to pick a time and date for the appointment that suits them. The check is simple and takes around 30-45 minutes.

What is a Well North Health check and how could it help me? More numbers!

A Well North health check consists of a nurse taking height and weight measurements and using these figures to work out the Body Mass Index (BMI). The Body Mass Index is used to estimate a healthy body weight based on a person's height. This is a way of calculating whether someone might be more at risk of developing long term conditions associated with obesity.

The nurse will also take cholesterol and glucose readings using a drop of blood from the finger dripped onto a small hand held machine. The numbers given on the digital read-out from this machine will help to show whether the person is at risk of coronary heart disease or diabetes.

There will be more numbers when the nurse asks about smoking and drinking and calculates whether the person's health is at risk due to lifestyle choices. Support will be available for anyone who feels they would like to change the way they live and or try to change the habits that have become the norm over the years e.g smoking cessation.

Of the total number of 2036 people in the three SIMD identified areas 655 people have missing data. These are our target group. It is predicted that over 450 will attend a health check when invited. The remaining 200 are our 'hard to reach group'.

In an effort to support the most disadvantaged people and not let them slip through the net completely this hard to reach group will be contacted by an Outreach Worker and encouraged to attend the appointment with their support if necessary.
Success stories from Phase 1:

The following list shows a sample of the kinds of issues which were uncovered and treated, as a result of the 1st phase of Well North:

Patient 1: Young patient referred to lipid clinic as a result of Well North blood tests. Patient has started taking a statin and stopped smoking as a result.

Patient 2: Modifying diet as a result of Well North health check. Lipid ratio within normal limits but not optimum.

Patient 3: Identified as having elevated CHD risk, i.e. elevated blood pressure and elevated lipid ratio. Now having regular blood pressure checks and lipid monitoring as a result, also trying to modify their diet.

Patient 4: Identified as having elevated lipid ratio, has stopped smoking and is modifying their diet.

Patients 5, 6 and 7: Medication and lifestyle advise given for high blood pressure.

Patient 8: Impaired glucose tolerance - further investigation and diet advice (to avoid developing into diabetes in future)

Patient 9: Altered liver function – blood test taken showed abnormal results, further investigation

Patients 10 and 11: Given smoking cessation support and Nicotine Replacement Therapy

Patient 12: Irregular pulse requiring treatment
6. ALCOHOL

Drink Better is a local initiative aimed at changing the alcohol culture from one of drinking for intoxication, to drinking responsibly, and for enjoyment. We want to use social marketing techniques to achieve this.

Social marketing is a method of applying the science of marketing to social policy and behaviour change in the context of health improvement. In a book on social marketing, subtitled ‘Why should the devil have all the best tunes?’, Gerard Hastings argues that the techniques used by big companies to get us to eat big brand beef burgers and smoke particular types of cigarettes can also be used to encourage people to eat healthily, preserve their lungs and walk to work\(^1\). But to do this we need to be cleverer about understanding our target audiences. Social marketing uses techniques such as branding and ‘segmentation’, therefore understanding the very different reasons that people have for drinking alcohol, and the very different ways that different groups of people use alcohol will help us to design interventions which are far more likely to have an impact on them, because they are far more likely to be relevant.

Traditionally, alcohol statistics have tended to focus on the health-related aspects of drinking e.g. alcohol related admissions to hospital; illness rates related to liver disease etc. It might be felt that social information related to alcohol is harder to quantify. In fact there are lots of other things we know about alcohol in Scotland and Shetland, based on statistics and figures\(^2\):

\(^1\) Hastings G. Social Marketing; Why should the devil have all the best tunes? Butterworth-Heinemann, 2007
• Shetland has the highest number of licensed premises per head of population – the equivalent of 91 outlets per 10,000 people aged 18 and over, compared to a Scottish average of 42 outlets per 10,000 people aged 18 or over. For a population of 22,000, Shetland had 154 alcohol sales outlets. This means that alcohol is really easy to access in Shetland, so a policy that made alcohol harder to access would be a sensible move.

• In 2007, in Scotland, 24 litres per capita of pure alcohol was sold, compared to 20.5 litres per capita in England and Wales combined.\(^3\)

• In general, men in Scotland are more likely than women to binge drink, except for 16-24 year olds, of whom 60% of both sexes reported drinking more than twice the recommended daily limits. So we know from this that it would be silly to target a campaign on binge drinking at women aged 50-65.

• For men in Scotland, the proportion drinking more than the weekly recommended limit was highest in the 45 to 54 age group with 38% drinking over 21 units per week. So we need to focus some work on men in this age group.

The Scottish Social Attitudes survey 2007 (SSA 2007) contains some really interesting and useful information on attitudes towards alcohol including where people usually drink (broken down by age), who they usually drink with by age, and whether they feel getting drunk is socially acceptable.\(^4\)

Although alcohol is seen as creating problems for wider Scottish society, this does not necessarily translate into a sense of shared social responsibility as far as individuals with drink problems are concerned – 47% believe that most people with serious drink problems have only themselves to blame, while just 31% disagree. However, over half (53%) agree that they would feel partly responsible if a friend they were with got drunk and ended up in trouble.

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\(^3\) The amount of alcohol purchased is converted to litres of ‘pure’ alcohol to allow total quantities to be calculated. 10ml of pure alcohol is equivalent to 1 unit alcohol (so 1litre = 100 units)

A commonly cited aspect of the role of alcohol in Scottish culture is its function as a 'social lubricant' – as something that helps people to relax and enjoy themselves on social occasions. This is highlighted by the SSA 2007 finding that although 8 in 10 (81%) believe it is possible to enjoy a night out in the pub without drinking, 4 in 10 (39%) still think that it is 'easier to enjoy a social event if you’ve had a drink'. This view is more common among men than women (49% compared with 31%). Moreover, although most people (74%) disagree that they would find it strange if someone who normally drank refused a drink on a particular occasion, concerns about the social acceptability of choosing not to drink are still apparent in the finding that 31% of drinkers agree that a lot of people they know would think it odd if they did not drink at all.

This is what is known as a subjective norm – people thinking that it might be thought socially unacceptable not to drink at all. Subjective norms play a key part in how society 'perceives' the norm to be. An important approach in changing behaviour is highlighting myths and perceived norms. The perceived norms contribute to drinking behaviour. How do we use this information to help make changes to drinking behaviour? If we can adjust people's perceptions of how common and normal a particular behaviour is, we may also be able to influence their inclination to engage with this behaviour. For example, if young people perceive that everyone around them drinks alcohol to get drunk, they are more likely to do so themselves. If we can challenge this perception they may be less likely to drink to excess. If everybody tolerates public drunkenness it is seen as acceptable and becomes the norm; we have seen the process in reverse in terms of smoking in public; as it becomes less frequent, it becomes less acceptable.

Applying social marketing approaches and techniques are one useful way of understanding the motivations of the drinking population. 'One size fits all' will not be the way to change behaviour. The right messages need to reach the right audience. We

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know from the statistics that different sectors of the alcohol consuming population exist. Marketing segmentation involves targeting the right sectors of this population with the right messages. For example:

Demographics: Age & sex influence the type of drinking behaviour to be addressed. Often, young people are characterised as drinking to excess. Drink Better aims to focus on the positives and highlight that unhealthy relationships with alcohol can occur ‘across the board’. Information gathered by Community Alcohol and Drug Services Shetland shows that, in 2009, 25% of Secondary 5 (S5) pupils reported that they didn’t drink alcohol. This figure has been increasing steadily since 2005, which is really positive\textsuperscript{7}. We need to work out how we can take positive statistics like these and use them to influence the drinking behaviour of other young people.

Less positive statistics show S5 pupils reporting that they are drinking an average of 17.6 units on their heaviest drinking days. So the statistics help us to understand that there is a problem; what we then need to understand (and what statistics aren’t so useful for) from a social marketing point of view is why this behaviour happens and what would help it not to happen.

Marrying the statistical influence of what information tells us, with the social approach of marketing and targeting specific pockets of a particular population, ensures that health behaviours and culture change is tackled as well as it can be.

\textsuperscript{7} Gill Hession, CADSS
So far this report has presented numbers about health and about populations. The other data that is commonly used in the NHS is of course financial data, and one of the sciences that public health professionals use in their work is health economics.

It is not the role of a Public Health report to look at the Board’s finances, though some of the information we use to describe local populations and their health is used in financial and policy decisions, for instance as part of the formula government uses to allocate resources to Boards.

The government allocates funding to NHS Boards based on a formula\(^1\) that takes into account four main factors:

- population;
- age-sex weighting (because there are particular costs to the health service associated with age or gender, for instance maternity services for women of child bearing age, or age-related illness which means that older people in general make more demands on the service);
- additional needs, which reflect relative need due to morbidity (ill health), life circumstances and other factors: the mortality rate among people under 65, the unemployment rate, percentage of elderly people living on income support; and multiple deprived households (i.e. households with two or more measures of deprivation); and
- an adjustment to take account of unavoidable excess costs of supply such as the costs of delivering services in remote and rural areas.
And if we are arguing for more resources, we want to use hard evidence to show either that there are local needs not adequately taken into account by national policy:

although methods of weighted capitation take deprivation into account, the needs of urban deprivation always outweigh the needs of remote and rural areas because within remote and rural areas deprivation tends to be dispersed and whilst identifiable at the level of the individual, geographical methods of categorisation of deprivation (e.g. data zones) are not sufficiently sensitive enough to recognise this.

Or perhaps that the formula has some inherent biases that work against local interests:

There is no minimum level of funding allocated to any NHS Board. This is important because there is a level below which services cannot go without becoming unviable. The formula does not recognise this, as the majority of funds are attributed through a percentage allocation rather than recognising that there are some absolutes in the delivery of care. This is inherently unfair to remote and rural areas where a basic level of service and associated infrastructure must be provided and economies of scale, which can be achieved in larger systems, will never be achieved.
At a local level, Shetland NHS Board (and Shetland Islands Council and other partners) make a range of policy decisions that should be informed by evidence, and public health has a role to play in providing and interpreting information about the population’s health to contribute to that decision making. At a basic level we can describe the population in terms of demography (see Chapter 3), or epidemiology. Figure 1 shows a selection of the actual, average or expected numbers of specific conditions / illnesses / events in the numbers that affect the Shetland population.

**Figure 1: A year of Shetland health statistics**

- 4 suicides
- 10 CABG\(^1\)
- 16 Breast Ca\(^2\)
- 40 new strokes
- 60 schizophrenics\(^3\)
- 80 asthma admissions\(^4\)
- 195 people living with chronic airways disease
- 280 births
- 800 very disabled
- 900 diabetics
- 2,000 mental illness & distress\(^5\)
- 3,000 smokers
- 3,400 hypertensives\(^6\)
- 4500 overweight / obese
- 7000 respiratory illness (primary care\(^7\))

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1. Coronary Artery Bypass Graft – a procedure for treating acute heart disease
2. Breast cancers – the average number diagnosed in one year in Shetland
3. People living with schizophrenia
4. People admitted to hospital with acute asthma
5. Presentations to primary care
6. People living with high blood pressure according to GP data
7. Presentations to primary care
Making Difficult Decisions

This pyramid pattern also demonstrates the model of services that currently exist and that we can build on to plan for the future. So the most common illnesses present most commonly to primary care / general practice, and the more complex problems tend to be rarer and need specialist services. In addition, when we see the numbers of conditions and presentations to services that are potentially preventable, we see the rationale for investing in prevention (both for the good of our health, and for best use of resources). But understanding what it would cost, or what we might save by investing in particular services is more complicated.

The drugs bill in Scotland for 2008/09 was about £1billion, which represents about 10% of NHS Board expenditure, and expenditure on medicines increases year on year in the NHS.

When a new medicine is introduced into use in the NHS, it goes through a rigorous process nationally from research (on average 12 years of research and development) and licensing – which considers whether the medicine has a measurable effect through clinical trials, to assessment of the drug’s clinical and cost-effectiveness for use in the NHS\(^8\). Some decisions have been controversial; sometimes because an individual drug is very expensive though clearly very effective (for instance rheumatoid arthritis disease modifying drugs), and sometimes because the effect is less certain but people living with an otherwise untreatable condition (such as dementia) are understandably looking for every chance of improving their quality of life.

This illustrates two sorts of decision making: decisions about individuals and the best treatment for them at any one time (made by clinicians), and decisions about populations and what treatments are made available within a service (made by the Board at policy level or through planning for service development).

Despite the technical complexities of an individual treatment such as a new medicine (or new technology), it is easier to make decisions when there is clear evidence of cost-

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\(^8\) Done for NHS Scotland by the Scottish Medicines Consortium (SMC), for England & Wales by the National Institute for Health and Clinical Excellence (NICE)
effectiveness. But for most health problems dealt with by current services, treatment is not so simple as one drug or one operation. Often interventions need to be complex and tackle a range of factors such as other complicating illnesses or social issues. Some pathways are very simple – such as stitching a wound, or plastering a broken bone. But increasingly both acute and chronic conditions are part of a more complex set of interactions with the health service – with increasingly sophisticated technologies and a wider range of professionals involved. Maybe a series of investigations to lead to a diagnosis, maybe the support of a range of therapists, or advice on treatment from a specialist based in a mainland centre.

In most cases it is difficult to attribute resources accurately to different services because the NHS does not accurately cost all activity (as opposed to private or insurance based schemes where costing is directly linked to charging and recouping income). Some areas are more easily costed than others, because they are more ‘stand-alone’, for instance maternity services. In Shetland this is a good example to use, because some of the maternity service is provided by Consultant Surgeons who do emergency surgery such as Caesarian Sections, and their costs are difficult to untangle from the general surgery costs, whereas in a mainland Board there would be a direct cost of Consultant Obstetricians who only do maternity care as there is for midwives, that could be included in costing a maternity service.

There is now a movement within health services in England and Wales to go down the road of programme budgeting\(^9\): the analysis of expenditure in health care programmes, a well-established technique for assessing investment in programmes of care rather than services. It allows judgements to be made about what potential shifts in resources or investment will bring the most health gain and increase quality.

\(^9\) [www.dh.gov.uk/programmebudgeting](http://www.dh.gov.uk/programmebudgeting)
It has been used for instance to look at the costs of alcohol related harm, to justify investment in alcohol prevention and treatment services. And to see how things change over time, using measures such as alcohol related admissions and mortality, but also alcohol related crime figures so not only health services but other impacts. Or to look at the costs of complications from chronic conditions such as diabetes and what can be saved by investing in targeted prevention programmes.

We don’t as yet have good enough costings to be able to do this very effectively locally either in Scotland or in Shetland, but we can start to use the principles to understand patterns of disease and future changes. We would call this the public health approach to planning.

We might, for instance, model rates of diabetes (prevalence) in the future assuming that current rates of obesity continue to rise. And then modelling potential prevalence if we reduce obesity levels so we not only predict the impact on mortality, (as we have done in chapter 2) but also what level of service we will need in the future.

Similar approaches have been used to set priorities for the development of services or the introduction of new services. Research to set priorities of locally commissioned services in England\(^\text{10}\) identified the following interventions within the 8 public health

\(^{10}\) Matrix Evidence and Bazian, Department of Health, Prioritising Investments in Public Health. October 2008
areas investigated, that are both effective and cost-effective and which should, therefore, be considered in any prioritisation process:

- Drug therapies for smoking cessation, specifically nicotine replacement therapy (NRT) and bupropion.
- School-based programmes for obesity prevention, specifically interdisciplinary curricula.
- Brief interventions in primary care for high risk drinkers.
- School-based programmes to prevent illicit drug use, specifically life skills training interventions.
- Individual risk counselling to reduce Sexually Transmitted Infections (STIs).
- Screening for STIs coupled with treatment.
- Vaccinations for influenza for the elderly.
- Fall prevention programmes for the elderly.

Investing in prevention and health improvement is a longer term measure to save money (and mortality / morbidity) – ‘investing to save’. Increasingly we are obliged to find savings in the shorter term to live within limited resources. There is a lot of jargon attached to this – we talk about “making efficiencies” or “managing scarcity” rather than cutting costs.

‘The elephant in the room’
But why is cost-cutting such a dirty word? Don’t we all cut costs when we manage the house-keeping, limit our choices / cut our cloth to suit our purse? ... take the bus because it’s cheaper than the car; sometimes trade off time and convenience for expense; choose a holiday instead of a new kitchen; want our children to learn to spend their pocket money wisely, not to think there is “always more where that came from”. Why should Public Sector budgets be any different?

And again, we should use the information available to us to make decisions based on the best possible evidence. Some of the approaches used in funding restrictions are likely to result in destructive deteriorations in services, such as indiscriminate spending cuts where costs are considered over value, preventative service and staff training. The National Institute for Health and Clinical Excellence (NICE) in England established a disinvestment programme with the aim to identify specific healthcare interventions of equal or lesser effectiveness than other interventions for the same condition, but found lack of evidence that made evaluation problematic, and few that would be of material interest for cost saving.

But there are some examples of using public health approaches to make these ‘difficult decisions’. Dr Sheila Scott, DPH in the Western Isles undertook a piece of work to look at areas that might be candidates for disinvestment and found 450 commonly performed surgical, medical and population level interventions that were of questionable benefit. Four sentinel conditions: tonsillectomy, dilatation and curettage (D&C), varicose veins and grommets showed wide variation in practice across Scotland, with an up to nine-fold variation in rates between NHS Boards.

And there is the potential for cost savings in some of the work now primarily being done in the name of quality: reducing medicines waste (medicines prescribed and collected but never taken); reducing unnecessary follow-up hospital appointments (when patients are asked to come back for a check-up rather than only if they had a problem); encouraging resilience and self-help.

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11 QIS Scottish Health Technologies Group Disinvestment and technologies: a discussion paper. Feb 2010
12 http://www.nhsfife.scot.nhs.uk/difficultdecisions
There is a well known public health allegory: preventing deaths by drowning and the costs of rescue for people falling into a river, by building a fence up-stream to stop folk from falling into the river in the first place. Perhaps we should go a step further and teach people to swim, so if they fall in they can clamber out safely themselves. Or even further: encourage wild swimming so that we embrace the environment as well. Then we save the costs of not only the ambulances but also the fences, and we have an independent and healthy population well able to take care of themselves and reach out a helping hand to those who need it.

“The purpose of the NHS is to secure, through the resources available, the greatest possible improvements to the physical and mental health of the people”

Our National health - NHS plan for Scotland

So the science of public health can help to aid ‘good’ decision making – that is to help with some of these “tricky issues”.
Glossary & Abbreviations

GLOSSARY & ABBREVIATIONS

BMI - Body Mass Index (BMI) is calculated by dividing an individual's weight in kilograms by their height in metres squared.

CADSS – Community Alcohol and Drug Services Shetland

Causation – relationship of cause and effect

Comparison – comparing; similarity or equivalence

Correlation – a link between two factors

DDD – Daily Drug Doses

Demography – study of populations statistics, such as births and deaths

Epidemiology – study of rates of illness and patterns of disease

GP – General Practitioner

GRO - General Register Office

MMR – Measles, Mumps and Rubella vaccination

Neuropathic pain – pain that is neurological in origin – coming from the central nervous system

QOF – Quality and Outcomes Framework. A set of measures used to inform funding for GP practices

ScotPHO – Scottish Public Health Observatory

Segmentation – dividing a population into different parts to target interventions

SIMD – Scottish Index of Multiple Deprivation

SSA – Single Shared Assessment

Standardised Mortality Ratio – Deaths adjusted to take account of the age and sex of a population

Subjective norm – what people think or perceive to be usual or common

Trend – general tendency or direction

WHO – World Health Organisation
ACKNOWLEDGEMENTS

We are again this year publishing the report primarily on NHS Shetland’s website:

[link:www.shb.scot.nhs.uk/organisations.shb.htm]

This includes our standard reports on core public health business listed as appendices.

Paper copies of the report and other formats are available, on request, from

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