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INTRODUCTION

Last year, this report discussed the creation of health as well as the burden of disease. This year, I will continue with the same theme. If we are to make a significant impact on the incidence of ill health in Scotland, we need to pay attention to the ways in which we create health.

A number of programmes and policies have been introduced in Scotland in recent years aimed at improving health and wellbeing in Scotland. Some have proved effective. Smoking related illnesses, for example, are declining and the gap in incidence between rich and poor is narrowing. This outcome has been achieved by a combination of legislation and action across communities to highlight the dangers of smoking and to support smokers in their attempts to quit. In other areas, improvements have yet to be realised. Obesity, poor diet and excessive alcohol consumption continue to be a cause of unacceptable levels of ill health which are inequitably distributed across society.

The late Campbell Christie chaired a Commission on the Future Delivery of Public Services which reported earlier this year. The Commission discussed the need to do things differently. It talked of the need to involve people more in shaping and running public services in the future. In the 2009 Annual Report of the Chief Medical Officer, I suggested that it may be time to change the methods we currently use to improve health and to move to more asset based approaches to improve outcomes. I proposed that asset based approaches may provide the necessary step change in health creation which Scotland needs to accelerate gains in healthy life expectancy across the population. The past year has seen further development in thinking and action on an assets approach to health. The coming year will be important in turning theory into more concerted action.

There is willingness in Scotland to embrace new thinking in our efforts to narrow health inequalities, and make Scotland a better place to grow and develop. If we can capitalise on this positive mind set, we can make changes which may result in significant improvements to the health and wellbeing of all Scots.

Sir Harry Burns
The Chief Medical Officer for Scotland
Mortality rates from Scotland’s big three killers, cancer, coronary heart disease (CHD) and stroke, continue to decline. The premature mortality rate – that is, the rate of death from all causes in those under 75 – has fallen by 28%, from 507 per 100,000 in 1995 to 365 per 100,000 in 2009. This reduction is the result of significant reductions in premature death rates from cancer (22%), CHD (60%) and stroke (54%) between 1995-2009. The death rate from other causes of death has fallen slightly but the major reductions have been from vascular disorders.

It is likely that these reductions in premature mortality are due to several factors. Management of illness has undoubtedly improved in the past 15 years. Early detection, better treatment and better organisation of care together account for much of the improvement. The trends are favourable. However, not all sections of society are benefiting at the same rate and, overall, Scotland continues to have a higher level of ill health than most of our immediate neighbours in Europe. In Scotland, we have high quality and effective health care. Our challenge continues to be that of improving health and wellbeing and, in the process, risk of premature death will reduce. Attempts to improve health have usually involved programmes to change those behaviours which lead to ill health.

The problem which health promoters usually encounter is that some sections of society are more likely to adopt healthy behaviour than others. Unless the factors which make some people resistant to changing behaviour are considered and dealt with, attempts to improve health will be ineffective. Patterns of health related behaviour have been assessed for a number of years through the Scottish Health Survey. The 2010 Survey is available at:

http://scotland.gov.uk/Topics/Statistics/Browse/Health/scottish-health-survey/Publications
CHAPTER 2
Behaviours associated with ill health

Trends in the behaviours associated with increased risk of ill health are assessed in Scotland by the Scottish Health Survey which was first commissioned in 1995 and is now produced for the Scottish Government by a collaboration between the Scottish Centre for Social Research, the MRC/CSO Social and Public Health Sciences Unit at the University of Glasgow and the Department of Epidemiology and Public Health at University College London. The sixth survey reports the results of interviews with over 9,000 adults and children in 2010 and provides information on a number of risk factors, including smoking, alcohol, diet, physical activity and obesity.

The report also includes important analysis of how multiple risk factors interact. Five risk factors have been examined: alcohol consumption, smoking, low fruit and vegetable consumption, physical inactivity and obesity. It highlights the importance of taking an integrated approach to improving health and joining up services in order to improve Scotland’s public health.

1. Alcohol consumption

Scotland’s consumption of alcohol over the past decades has been a source of enormous concern. It has been estimated that per head of population, Scotland drank nearly 50 million litres of pure alcohol in 2007 equivalent to 11.8 litres per capita for every person aged over 16. This was significantly higher than England and Wales, which had an average consumption figure of 9.9 litres per capita. It has been suggested that Scotland has the eighth highest per capita consumption of alcohol in the world.

The responses to the 2010 Scottish Health Survey suggested that the mean weekly alcohol consumption among adults aged 16 and over declined by 18% between 2003 and 2010. Men reported that the mean number of units they consumed per week fell from 19.8 to 16.0, a fall of 19% over the same period. Among women, the reported mean weekly consumption fell from 9.0 to 7.6 units, a fall of 16%. The proportions of adults reporting that they drank in excess of recommended weekly limits also declined between 2003 and 2010, from 28% to 22% (33% to 27% for men and from 23% to 18% for women).

These reported levels of alcohol consumption are inconsistent with a recent report from NHS Health Scotland which based its estimate on sales data. Alcohol sales in Scotland in 2010 were equivalent to 22.8 units per person per week, almost double the Scottish Health Survey 2009 estimates (12.4 units) (http://www.healthscotland.com/documents/5435.aspx). The reason that sales data and reported data from the Health Survey seem in such conflict may be a reflection of the tendency for people to underestimate their alcohol consumption.

The proportion of men who reported their alcohol consumption exceeded the recommended daily limits rose slightly from 43% to 45% between 2003 and 2010 and the proportion of women exceeding their recommended limits declined from 37% in 2003 to 33% in 2010.

Although the reported volume of alcohol consumed may have reduced slightly over the past year or two, there is evidence that present levels of drinking are continuing to
cause problems. The Health Survey asked participants questions designed to detect problems in their daily life caused by their drinking. Among all adults aged 16-74, the proportion reporting two or more problems rose from 9% in 1998 to 13% in 2008, and was 12% in both 2009 and 2010. The proportion reporting no problem indicators declined from 77% in 1998 to 70% in 2010. This observation suggests that alcohol consumption as determined by the sales data may be more reliable than self reported levels of drinking.

However, in association with the reported decline in consumption, there has been a small decline in the number of alcohol-related discharges from general acute hospitals in Scotland between 2008/09 and 2009/10. The number of alcohol-related discharges declined from 41,977 to 39,278. Over the past five years, mortality directly due to alcohol has fluctuated from year to year.

Consumption of alcohol in the population is determined mainly by price and availability. It would not be a surprise if there was an actual reduction in alcohol purchases in response to adverse economic conditions which have increased price relative to earnings. It may also be that the debate about alcohol and the harm it causes to our society has increased public awareness of the hazards of alcohol and will help reduce consumption.

2. Smoking

Over the past 15 years, there has been a decrease in the number of adults smoking in Scotland. The rate of smoking in those between 16 and 65 has fallen from 35% in 1995 to 28% in 2010. Including over 65s, 25% of adults in Scotland smoked in 2010. Men have always smoked more than women but over many years, as rates of smoking in men have declined, the rate in women has increased. The proportion of men and women who are smokers is now the same.

Most smokers would like to quit and the Scottish Health Survey estimates that 69% of Scottish smokers are anxious to give up. Women are more likely than men to have made attempts to stop. The desire to stop smoking is as common in deprived areas as it is in more affluent areas. Between 1995 and 2010, the proportion of adults aged 16-64 who say they have never smoked regularly has increased from 49% in 1995 to 54% in 2010.

The significant decline in the smoking rate over the past decade has made a major contribution to the fall in deaths from heart disease, stroke and cancer. Continued efforts to support smokers in their attempts to quit will bring significant further benefits to the health of the population.

3. Obesity, diet and exercise

Obesity

There has been a steady increase in the proportion of adults who are overweight or obese since the first Scottish Health Survey in 1995. Between 1995 and 2010, the proportion of adults aged 16-64 who were overweight or obese increased from 52.4% to 63.3%. There was an increase amongst men from 55.6% to 66.1% and the increase amongst women was from 47.2% to 60.3%. In addition, the proportion of men and women who are obese, not just overweight, increased from 17.2% to 27.4%. Most of these changes have occurred between 1995 and 2008 and there is the possibility that the rate of increase may be slowing.
Diet

In 2010, 22% of adults (20% of men and 23% of women) met the recommended daily intake of five or more portions of fruit and vegetables. The proportion of adults meeting the recommendation has not changed significantly over time. On average, adults consumed 3.2 portions of fruit and vegetables each day. Mean daily consumption was slightly higher for women (3.3) than for men (3.1). Adults aged 16-24 and those aged 75+ were the least likely to consume five or more portions a day (17% and 19% respectively). For children aged 5-15, the proportions meeting the recommended daily intake (five or more portions a day), were not significantly different in 2010 compared with 2003 and only 12% of children aged 2-15 met the recommended daily intake of five or more portions.

The Scottish Health Survey inquired about how often families ate together and related their eating arrangements to consumption of fruit and vegetables. Only 6% of adults living in households that ate together more than seven times in the previous week had eaten no portions of fruit and vegetables, compared with 15%-16% of adults in households who did not eat together or only did so once or twice each week. The mean number of portions of fruit and vegetables consumed was higher in children in households that had eaten together more than seven times (3.0 portions) than those in households that only ate together once or twice (2.3 portions). This observation is, perhaps, not surprising but it is an important observation to have confirmed.

Physical activity

The recommended levels for physical activity in adults are that they should accumulate at least 30 minutes of moderate activity on at least five days of the week. Children should accumulate at least one hour daily.

In 2010, 39% of adults aged 16 and over met the physical activity recommendations. Men were more likely to meet them than women (45% compared with 33%). There was no significant change in the proportion of the population meeting the recommendations between 2008 and 2010. 44% of adults had accumulated exercise time through participation in sport in the previous four weeks.
Physical activity levels of children outside school have been broadly static for many years. In 1998, 65% of children aged 2-15 were physically active at the recommended level. This estimate excluded school-based activity, which was not measured until 2008. This increased slightly to 69% in 2003, but has been 64%-65% from 2008 onwards. With the inclusion of estimates of physical activity including school based exercise, a more accurate picture emerges. In 2010, 72% of children (75% of boys and 70% of girls) met the physical activity recommendations when school-based activity was included. Boys maintain their activity levels as they get older while the level of exercise amongst teenage girls falls markedly in the 13-15 age group.

4. Multiple risk factors

For the first time, the Scottish Health Survey has considered how these different risk factors coincide in the population. The authors estimated the proportion of the population with one or more of the risks measured in the Survey. Specifically, these were: alcohol consumption outwith the recommended limits, cigarette smoking, not meeting the physical activity recommendations of at least 30 minutes on five or more days week, eating fewer than five portions of fruit and vegetables per day, and having a Body Mass Index of 25 kg/m² or more (overweight or obese).

In 2010, just 2% of adults in Scotland had none of these risks, though only 4% had all five risks. The mean number of risks was 2.7, 59% of adults had three or more risks, while 24% had four or five.

People aged 16-24 were the least likely to have three or more risks, and those aged 16-24 and 75 and over were the least likely to have four or five risks. The most common combination of risks was being overweight, not meeting the physical activity guidelines and not eating recommended quantities of fruit and vegetables (15% of adults in Scotland had these three risks). A further 10% had these three risks and also drank outwith the recommended limits. This pattern of risk is unsurprising. It confirms a picture of poor diet and lack of exercise leading to being overweight and obesity. The calorie content of alcohol probably contributes significantly to obesity in those who drink beyond recommended limits.

When analysed by gender, the survey suggests that young women had a worrying pattern of risk behaviours. They were twice as likely as young men to have four of five risks. When all age groups were considered, similar proportions of men (25%) and women (23%) had four or five risks.

Predictably, people in more socio-economically disadvantaged groups tended to have a higher number of risks than the more affluent. The age-standardised mean number of risks increased from 2.6 in men and 2.4 in women in the least deprived areas, to 2.9 in men and 3.0 in women in the most deprived areas.
Factors that were independently associated with having an increased number of risks were identified. Low levels of educational attainment and being out of work through sickness or unemployment were significant factors for both men and women. The analysis confirmed that women living in areas of high deprivation had a higher number of risks.

5. Mental wellbeing

Mental wellbeing has been assessed in the Scottish Health Survey using three scales. The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS), the GHQ12 scale and a life satisfaction score were all used in the assessment. The average WEMWBS score was 49.9, and was higher among men (50.3) than women (49.6). It was not significantly different from the WEMWBS scores in 2008 or 2009. WEMWBS mean scores were associated with age with younger and older people having a higher score (and a greater sense of wellbeing) than those aged 35-54.

15% of adults had a GHQ12 score of four or more, indicating the presence of a possible psychiatric disorder. Women were more likely than men to have a high GHQ12 score (17% and 13% respectively). In addition, a high score was also associated with age. It was most common among people aged 35-64 (17%), and least common among those aged 65-74 (11%).

The life satisfaction scale runs from zero to ten, where ten indicates 'extremely satisfied'. The most common level of life satisfaction reported was eight which was reported by 31% of adults. 30% of adults had an above average level of life satisfaction (nine or ten), and 40% rated their life satisfaction as zero to seven.

Men and women had similar levels of life satisfaction, but, like the other measures of mental wellbeing, scores varied with age. People aged 65-74 were the most likely to report an above average level of life satisfaction (44%), while those aged 25-54 were the least likely (25%-26%).

The three measures of wellbeing presented in this chapter (WEMWBS, GHQ12 and life satisfaction) were all associated with socio-economic factors. Generally, higher levels of wellbeing were experienced by people in professional occupations and living in higher income households and less deprived areas of Scotland. Lower levels of mental wellbeing were consistently reported by those of working age.

6. Conclusion

The Scottish Health Survey confirms that behaviours associated with risks to health are more common in less affluent areas. The population is becoming more overweight although smoking is becoming less prevalent. Trends in physical activity and diet seem stable. The data on alcohol consumption is conflicting but information on alcohol purchases suggest that it may be increasing. Mental health is poorer in deprived areas and amongst working age people.
CHAPTER 3
Trends in indicators of health inequality

In 2007, a Ministerial Task Force on Health Inequalities was established to monitor trends in health inequalities and to consider action to improve the gap in health between the most affluent and the poorest areas in Scotland. The Task Force recognised that the effect of any action would most likely take some years to become apparent in routine health statistics. It recommended, therefore, that data should be collected to monitor progress in reducing health inequalities. The Task Force was anxious to be able to monitor progress in a number of areas and asked a group of experts to advise which indicators might be most suitable. The Scottish Government, in 2010, published the first report on the recommended indicators (http://www.scotland.gov.uk/Publications/2010/10/25144246/2).

The group’s recommended indicators were:
• Healthy Life Expectancy at birth
• Premature Mortality from all causes aged under 75 years
• Mental Wellbeing of adults aged 16 years and over
• Low birthweight

In addition, the group recommended that markers of inequalities in the effects of a number of conditions should be measured. These include:
• Coronary Heart Disease
• Cancer
• Alcohol
• Deaths from all causes in the 15-44 years age group

The expert group suggested that the information would be most informative if it did three things. Firstly, it should provide an absolute measure of the health indicator. Secondly, it should provide a measure of the gap between the least and most affluent and, thirdly, it should indicate the size of the relative gap between the ends of the social spectrum. The relative gap is related to the mean or average of the population. As the overall level of a particular condition decreases in the population, the gap between each end of the population might be expected to decrease.

The measure of socio-economic deprivation is based on the levels of income and employment in a person’s area of residence. The data is grouped into datazones which are small areas containing around 800 people. They are split into ten groups, or deciles, each containing 10% of the Scottish population.
Healthy Life Expectancy (HLE) - at birth

The Healthy Life Expectancy (HLE) indicator is based on two years of data to ensure large enough sample sizes. Between 1999/2000 and 2007/2008, HLE increased by three years (4.5%) for males and 2.3 years (3.4%) for females. In 2009 the way in which HLE is assessed was changed to fit in with the way in which it is assessed in the European Union. The format of the self-assessed health question has altered and, consequently, the result is not directly comparable to previous years but should be seen as the first point in a new time trend for future years. A technical paper by the Scottish Public Health Observatory (ScotPHO) has more information on this change (http://www.scotpho.org.uk/home/Populationdynamics/hle/hle.refs.asp).

In 2009/2010, HLE at Scotland level for males was 59.9 years (16.3 years less than life expectancy) and HLE for females was 62.1 years (18.6 years less than life expectancy). HLE in deprived areas is lower for both males and females than HLE in areas of greater affluence. In 2009/2010, HLE of those living in the most deprived decile was 22.5 years lower for males. (Figures 2 and 3 show the data for males and females respectively.)

Data not available for 2003/2004. The red bars for each column indicate the uncertainties in each estimate of absolute difference in HLE.
and 22.1 years lower for females than HLE of those living in the least deprived decile. The difference between HLE and life expectancy is the expected years of life which are spent in ‘not good’ health. This is also notably greater in more deprived areas. Males experience 21.3 years in ‘not good’ health in the most deprived decile compared with 12.1 years in the least deprived decile. For females the figures are 24.9 years lived in ‘not good’ health in the most deprived decile compared with 11.6 years in the least deprived decile.

Death rate from all causes, aged under 75 years

Data on vital events in Scotland are available from the General Register Office for Scotland. Death rates are available online from:


In 2010, there were 54,000 deaths in Scotland. The rate of death under the age of 75 is generally taken as an indicator of the premature death rate and about 21,200 people under the age of 75 die in Scotland each year. However, we have seen a highly significant fall in the premature death rate over the past decade. Recently published analysis shows that, between 1997 and 2009, deaths amongst those aged less than 75 years have decreased by 24.9%. Deaths in this age group remain more common in deprived areas than in areas of affluence. In 2009, deaths amongst the most deprived under 75s were 3.7 times more common than amongst the most affluent. Whilst the gap between the most affluent and most deprived areas has been stable over the past few years, the significant fall in overall risk means a relative widening in inequality.
Mental wellbeing of adults aged 16 years and over

Positive mental wellbeing has been measured using the WEMWBS score. The Warwick-Edinburgh Mental Wellbeing Scale is a 14 point scale in which individuals respond to questions about their thoughts and feelings. Researchers are then able to estimate an individual’s mental wellbeing. The scale was only developed in 2006 so there is no long term trend data available yet. However, we can say that those in the most deprived decile reported a lower mean score (indicating lower mental wellbeing) than those in the highest decile. There has been no change in the absolute or relative difference between the groups. Given the short time that the test has been used, this is not surprising.
Low birthweight

Each year about 3,000 babies are born in Scotland with a birthweight of less than 2,500 grams. Between 1998 and 2009 the number and percentage of low birthweight babies has been relatively stable although there has been a fall in the percentage of babies born with low birthweight to mothers living in deprived areas. Low birthweight babies are twice as common in deprived areas than in areas of affluence and the percentage in the most deprived areas was 6.9 compared to 3.3 in the most affluent. The fall in the number of low birthweight babies together with a fairly stable level amongst the affluent means that there has been a reduction in relative inequalities.

First admission for heart attack under the age of 75 years

There has been a steady decline in the incidence of heart disease in Scotland for several years and this has been reflected in the number of first admissions for heart attack. Between 1997 and 2009, there was a 40% decrease. There have been reductions in inequalities in both absolute and relative terms during the past decade although there was a slight widening in 2009.
Coronary Heart Disease (CHD) - deaths aged 45-74 years

The decrease in CHD mortality over the past decade reflects the fall in CHD prevalence already mentioned. CHD mortality between 1997 and 2009 fell by 56%. Mortality in this age group in the most deprived areas is five times higher than amongst the most affluent. Although the mortality gap has narrowed in absolute terms, the gap has not narrowed in proportion to the fall in overall mortality so it has not narrowed in relative terms.

Cancer incidence in those under 75 years

The overall incidence of cancer in Scotland has remained broadly stable over the past 15 years. It has decreased by 2% since 1996 but fluctuated year on year with no clear trend since 1997. The gap in incidence between rich and poor is not as wide as that seen for heart disease and again the gap between socio-economic groups has been fairly stable.

Mortality from cancer

Over 15,200 people died of cancer in Scotland in 2010. Lung cancer accounted for approximately 27% of cancer deaths in males, and 26% of cancer deaths in females. It remains the principal cause of cancer death in both sexes. For the past few decades, there has been a falling incidence of lung cancer in men while the incidence has been rising in women. The probable explanation of these trends is that smoking rates amongst men have been falling steadily for many years while women have continued to smoke. There has been an expectation that the number of lung cancer cases in women would overtake the number in men. It remains to be seen if the incidence in women has levelled off and might start to decline as it did in men many years ago. Colorectal, breast and prostate cancer were the other major causes of cancer death.
Overall cancer mortality rates have decreased by 15% in males and 7% in females in the last ten years. In men, the largest falls in mortality among the top ten causes of death from cancer have been in stomach, lung and colorectal cancer (31%, 21% and 21% respectively). Death rates from prostate cancer, the most frequently diagnosed cancer in males in 2008, have decreased by 16% over the ten years to 2010. The death rate from cancer of the liver has increased by 48% in men over the last ten years, a statistically significant trend. This may be contributed to by increasing alcohol consumption over that period.

For women, the largest falls in mortality rate among the top ten causes of death from cancer were observed in stomach cancer and Non-Hodgkin’s lymphoma (40% and 26% respectively). The death rate from breast cancer, the most frequently diagnosed cancer in females, has decreased by over 18% over the last ten years, in spite of the increase in incidence of female breast cancer.

Survival from cancer

Simply describing the number of cases of cancer and the number of deaths which occur does not give the complete picture for cancer. Data on trends in incidence, mortality and survival from cancer in Scotland is produced by a wide range of statistical analyses based on data from the Scottish Cancer Registry and the General Register Office for Scotland. It is available at:

http://www.isdscotland.org/Health-Topics/Cancer/

Survival from cancer can be influenced by a number of factors. Obviously, obtaining a better survival rate as a result of more effective treatment is the most desirable way of increasing survival. However, better survival can be observed for two other reasons. Firstly, cancers may be diagnosed earlier. An early diagnosis may allow more effective treatment to be offered and the average survival improves because more people are cured. However, since survival time is calculated between diagnosis and death, early diagnosis produces an apparent increase in survival even if treatment is ineffective.

The past two decades have seen significant improvements in survival from cancer. Five-year survival for cancer patients, relative to the life expectancy of the population in general, increased from 26% for males diagnosed in 1983-1987 to 44% for males diagnosed 2003-2007, and from 36% to 51% for females. Such improvements are due, mainly, to three factors. Undoubtedly, treatment has improved. Research has produced better, safer surgery. Radiotherapy techniques and equipment are now more effective in controlling tumours and more effective drugs are now available for a range of cancers. In addition, treatment services are now better organised with patients being managed by multidisciplinary teams.

As already described, a third factor contributing to better survival is a change to the way in which some tumours are being diagnosed and, for some cancers, the improvement in survival may be more apparent than real.

For example, survival from prostate cancer has improved significantly over the past two decades from 56% to 85%. Undoubtedly, improvements in techniques of surgery and radiotherapy have contributed to this improved survival.
However, much of it is likely to be due to increasingly widespread use of prostate-specific antigen (PSA) testing. The PSA test enables some invasive prostate cancers to be identified earlier than in the past, leading to an increase in survival even for men whose death is not necessarily postponed by the treatment. Many prostate tumours remain dormant and never spread or cause symptoms and may only be found if the patient has a post mortem examination to investigate some other cause of death. The PSA test also identifies these tumours and the patient is then recorded as having the cancer although his life may never be threatened by it. The uncertainty of the best way to treat patients whose tumour is only detected by PSA testing makes any potential benefit from screening programmes difficult to detect and studies are underway in a number of countries to determine whether population screening programmes based on the PSA test are an effective way to reduce mortality from prostate cancer.

Some cancers are advanced when detected and treatment in these cases is often unable to cure the tumour. Cancers of the lung and some of the digestive organs are often widely spread by the time symptoms are significant. Survival tends to be better for cancers for which patients can be screened or those which are obvious to the patient at an early stage. Breast cancer is a tumour where effective screening has had an impact on survival and melanoma cancer of the skin is often obvious to the patient. For many cancers, there have been significant improvements in chemotherapy and conditions such as testicular cancer and leukaemia have seen enormous improvements in survival as a result.

A large improvement in survival has been seen for cancers of the colon and rectum with around 55% of patients now surviving at least five years after diagnosis, compared to around 38% of those diagnosed between 1983 and 1987. Improvements in perioperative care may have contributed to the increase in survival. Early diagnosis of these cancers is very important in determining options for treatment and increasing the probability of cure for the patient. The continuing rollout of the Scottish Bowel Screening Programme will increase early detection. These positive changes reflect an increase in diagnosis of early stage disease following health education programmes that encourage earlier presentation, attendance for screening and early referral.
Alcohol - first ever hospital admission aged under 75 years

In the decade to 2007, there was an increase of 18% in the rate of new hospital admissions for alcohol-related conditions among those aged under 75 years. Since 2007 the rate has fallen, particularly amongst the most deprived where admissions are five times more common than in affluent areas. Inequality had widened in the middle of the last decade but has narrowed again in the past few years.

Alcohol - deaths aged 45-74 years

During the past decade the number of deaths in this age group increased and then decreased so that, by 2008, it was broadly similar to that seen in the early years of the decade. There are nine times more alcohol related deaths amongst those aged 45-74 years in deprived areas than in affluent areas. The trends suggest that inequalities are similar now to what was observed a decade ago although the data shows fluctuations.
All-cause mortality aged 15-44 years

Between 1997 and 2009, rates of death have been stable amongst those aged 15-44 years. However, the pattern of deaths observed within this age group, has varied. Many of the deaths in this age group are due to causes such as drugs, alcohol, assault and suicide and it has been observed that rates of drug related deaths have doubled over this period. Rates of death from assault have stayed the same while rates of death from suicide have dropped by 14% (to around 430 deaths per year). However, the relatively small numbers involved mean that comparison of numbers for single years should be interpreted cautiously as there will be natural fluctuation from one year to the next.

Deaths amongst those aged 15-44 years are six times more common in deprived areas than in areas of affluence and while inequalities have remained fairly stable in absolute terms over this period, they seem to be increasing in relative terms.
CHAPTER 4
The health of prisoners

Introduction
The prime purpose of prison is not for health, but for public safety, for punishment and as a contributor to reducing re-offending. Nonetheless, health is an important part of a prison’s work, and good quality health care is integral to successful health and justice outcomes. Until now, prison has taken responsibility for the delivery of health care within its walls. Since November 2011, that responsibility has transferred to the NHS, reflecting the fact that offenders move often between prison and community, health inequalities are profound amongst offenders, and the potential for health improvement and long-term quality improvement in health care of prisoners is achievable through the stewardship of the NHS, in close partnership with prisons.

Offenders are people who are sourced predominantly from the most challenged communities in Scotland, with the fewest personal assets, the highest mortality even compared to the communities from which they are drawn and therefore, potentially, the most to gain from interventions that support health and wellbeing. Prison is home to a group of people who, for periods ranging from days to decades, carry the added health risk of loss of liberty and its many consequences. The steady increase in the number of people going to prison means that a rising proportion of the population are no strangers to prison, as detainees or as visitors.

About prisons
In Scotland today, there are 15 prisons holding, on any one day, over 8,000 detainees. 19% are on remand. 2,726 remained in prison for the entire year, but the large majority of the 27,700 individuals imprisoned in 2010 moved in and out of prison within the year.
95% of prisoners are men. Most are young, although the fastest growing sectors of the prison population are women and older men. Unlike in other prison systems around the world, there is a relatively low proportion of people from ethnic minorities, and illegal immigrants.

**Key health issues**

Almost every health problem and risk is over-represented in the prison population, relative to the age and stage of similar groups in the community. Much health-related information is drawn from facts that prisoners give about themselves, consistently over substantial periods. A rising proportion - currently 50% - report that they were drunk at the time of their offence. The number rises to 75%, if that offence was murder. 70% of prisoners report a drug problem on admission to prison. Over 50% report a mental health problem. A recent study shows that the mortality of prisoners is over twice as high for men, and over five times higher for women, compared with people in the communities from which they came. And repeated, short sentences or detention on remand expose prisoners to even higher risks of dying soon after release.

It is therefore no surprise that, in addition to the usual request for information when booking into the health centre on admission to prison, staff routinely ask whether the person is withdrawing from drugs or alcohol, and whether the person has any suicidal thoughts or feelings.

Health services in prison consist of primary medical care, together with an enhanced ability to support people with addiction and mental health problems. Prisons also offer dental and optometry services, pharmacy and some allied health professional services. A specialist psychiatry service consults in each prison and there is an increasing number of in-reach specialist services to reflect common and serious conditions such as infection with Hepatitis C. Visiting specialists, and use of communication technologies to enable tele-health, can provide a more efficient model of care than prisoners attending out-patient clinics, with all the attendant security and privacy issues.

![Figure 13: Estimating mortality of people who have been in prison in Scotland - relative risk for men imprisoned in Scotland for the first time 1996-2007, by number of imprisonments and total time spent in prison.](image-url)
The experience of prison as a patient

When a prisoner arrives for the first time, they lose their choice of health care provider. There are many implications to the loss of liberty that affect health - including social, emotional and mental wellbeing. Chief amongst these are domestic ties including the care of children which, for young women in prison, is a particularly difficult experience.

For prisoners on remand or serving short-term sentences, experience can be mixed. Imprisonment creates a barrier not only from the victims of crime but also, possibly, from someone who is abusing them. Prison is also a place where it is difficult to conduct a risky, health deteriorating lifestyle that misuses alcohol or drugs. Mental wellbeing often worsens although, for those who are vulnerable and familiar with the processes of prison, the routine and orderly nature of the prison day can be a source of relative comfort. Contact with health services is very frequent as people come to terms with their health issues. Prisoners also seek access to services that they have not attended in the community - for instance, 85% of prisoners have never been to the dentist in the community since leaving school.

Long-term prisoners adopt a routine that sustains them through their sentence. During their imprisonment, they engage in programmes that seek to address their offending, but they also may endure long periods of isolation and boredom. Prison also offers the opportunity to address health and lifestyle issues. One example is the development of programmes of recovery from addiction, and to detect and treat Hepatitis C - also to prevent its transmission to other prisoners. Scottish prisons have succeeded in increasing sharply the number of people being tested for the virus and entering treatment with the possibility of cure. Not only does this have a positive effect on their future health and the use of expensive services later on in life, but also they will pose no infection risk to people with whom they come in contact after release from prison. Prison is also a setting of public health importance to the control of Hepatitis B in Scotland. This virus is highly prevalent around the world, particularly amongst intravenous drug users in the Western world. Through the prison Hepatitis B immunisation programme, levels of protection against the virus through vaccination have risen amongst the Glasgow drug using community from 14-18% to over 50% immediately following introduction of the measure ten years ago. It is likely, therefore, that the very low levels of recorded Hepatitis B infection in Scotland are, in part, due to measures taken to immunise prisoners.
During a long prison sentence, prisoners have the opportunity to improve their diet and levels of physical activity and engage on programmes about sexual health and relationships. Women have access to a variety of health programmes tailored to their needs. Across all prisons, 76% of prisoners smoke, and 56% of smokers say they would like the opportunity to give up. Over 500 per year in recent years have taken part in smoking cessation support.

**Rehabilitation, leaving prison**

Prisoners who are approaching release from prison, especially after a long time in prison, need preparation. The total experience of returning to the community, to families and to homes (if they have them) can trigger a fundamental re-appraisal. Commonly, addictions are a continuing challenge and they may need continued and regular contact with drug or alcohol problem clinics. Recent Keep Well programmes for offenders aged over 35 have encouraged prisoners to contact their local health service on release to continue self-management of health conditions and to seek support as a way of sustaining rehabilitation.

Release from prison is a time of particular risk, and the possibility of making fatal mistakes. The incidence of drug-related death and suicide soon after release from prison is extremely high. The Prison Service has responded by seeking to support people through education, mental health and addiction support, mentoring at the time of release from prison, guidance to clinics and agencies soon after release, education on the hazards of drug use and drug overdose, and the offer of Naloxone, an antidote to opiate overdose, in a programme starting in 2011. Following their release, former prisoners face much higher risks of death from accidents, violence or suicide. Inequalities persist, worsened by their past offending and its consequences.

Of the many individuals who come through Scottish prisons each year, only 20-25 per year die in prison custody. This means that the remainder can expect to return to their community having experienced a regime which aims to improve their chances of living a law abiding lifestyle and taking their full part as contributors to their communities in future.
The NHS and prisons

NHS specialist services treat prisoners in hospital as they would any other patient in Scotland. However, provision of health services in prisons is a new development. Prisoners leave their local communities and, until now, have left the NHS behind for its day-to-day care. With the transfer of responsibilities for prisoners’ health care to the NHS, there are now opportunities to continue care into and out of prison, address complex and profound health needs, and to sustain the health and wellbeing of offenders who leave prison in a healthier state than at the time of arrival. Health services cannot do this alone. Many prisoners with complex needs will need joint means of support. This means continued engagement with community justice, housing, social and voluntary services. Public health approaches include prevention of the transmission of disease, and increasingly approaches towards violence reduction and engagement with programmes that reduce the risk of re-offending such as literacy, education and training, supported employment and access to appropriate benefits. Therefore, health services will develop many links across the range of social and health programmes.

Prisons are now turning to consider that young people in their care are not only offenders, but parents, parents-to-be as well as partners with relationships and responsibilities. This may be one of several routes to effective re-integration into society underlining the need for prisons to encourage prisoners to remain engaged with communities and families whilst in prison.

Meanwhile, the Prison Service has embarked on a substantial period of capital investment to replace its old prisons and to expand its capacity to take more prisoners. There is an absolute need to replace prisons in order to ensure humane living conditions for prisoners, and for the staff who work in these places. The Service’s greatest challenge and one that serves to undermine re-integration, is persistent overcrowding of prisons, despite a steady increase in their capacity.

In conclusion, the task of prisons is to create an environment of safe custody and good order, humane care and opportunities for re-integration after periods of detention. It aims to provide an environment of hope and challenge, and the ability to build on personal assets of offenders. Good health services are integral to the task of prisons. Prisons, in turn, can be a prime setting in which to tackle health inequalities, most starkly demonstrated by the high mortality of prisoners who have recently been released. Part of the contribution of prison health services reduces the harm that loss of liberty incurs - harm to the prisoner, the effects on other prisoners, but particularly harm to children, families and communities they leave behind and, usually and inevitably, to whom they return.
Hallowe'en for prison visitors in HMP Perth
The preceding sections report some encouraging trends. Most notable are significant reductions in admission and death from cardiovascular disease, improvements in survival from many cancers and reduction in prevalence of some risk factors. There is even some evidence of reduction in relative inequality in deaths from cardiovascular disease and the prevalence of low birthweight babies. However, in too many areas, the trends are showing no improvement or even signs of moving in the wrong direction.

The Scottish Health Survey seems to indicate that around 25% of Scots eat a poor diet, take insufficient exercise, drink too much alcohol and are overweight or obese. Numerous attempts have been made over the years to encourage individuals to alter their behaviour. Health promotion campaigns usually have a positive effect on some people but often those in most need of changing their behaviour are least likely to take notice of such campaigns. Risky behaviours such as smoking and excess alcohol consumption are often a response to adverse life circumstances and, simply to focus on the behaviour without tackling the underlying circumstances which provoke the behaviour, misses the point. A new approach which allows individuals to feel more in control of their lives and social circumstances is necessary and that is why, in previous reports, I have mentioned the concept of the “assets approach” to improving health and wellbeing. It offers a coherent set of ideas and concepts for identifying and enhancing those protective factors which help individuals and communities maintain and enhance their health even when faced with adverse life circumstances.

The underlying theory

Previous reports have included reference to the work of Aaron Antonovsky, the American sociologist who coined the term “salutogenesis”. This was, he suggested, the process by which individuals and communities created health. The medical profession, he argued, was obsessed with pathogenesis - the causes of disease. They should, he argued, be studying the factors which create health in individuals and communities - salutogenesis. By studying factors which create and support human health rather than those which cause disease, we should be able to identify resources and capacities which impact positively on health and which explain why, in adverse circumstances, some stay healthy and others don’t.

The asset approach to health improvement is based on Antonovisky’s concept of salutogenesis. It is a set of concepts and actions which seem to offer the most coherent and evidence based approach to the creation of health and wellbeing. It does this in several ways. A key aspect of Antonovsky’s theory is the idea that having control of one’s life and circumstances is health enhancing. Central to the assets approach is the idea of helping people to be in control of their lives by developing the capacities and capabilities of individuals and communities. It draws on existing approaches that foster effective and appropriate involvement of the people and the professionals who serve them. In addition it identifies techniques (for example asset mapping) which facilitate collaborative work between individuals, communities and organisations towards securing better health and wellbeing.
Current approaches

The conventional approach to the delivery of public services is based on meeting needs or delivering treatment. Individuals are characterised as “smokers”, “drinkers”, “drug addicts”, “unemployed”. Communities are described in terms of their problems. They are “areas of multiple deprivation” with high levels of crime, single parent families, premature mortality. People and communities are defined by their deficiencies. Public services set out to fix problems for individuals and communities and, in doing so, they take away control from people by making them passive recipients of services. Evidence suggests that a sense of control over one’s life is associated with better health and a greater likelihood of adopting healthy behaviours. Undermining that sense of control, it is argued, increases passive acceptance of risk. It is not particularly surprising if people who are consistently told they are living deprived, hopeless lives tend to respond with passive acceptance. The outcome is an increasing dependence on services provided by others.

Over time, areas of Scotland which have seen collapse of industry and employment have experienced the greatest concentration of social and health problems. Once again, economic problems are threatening the ability of communities to sustain themselves. The economic difficulties facing European countries such as Greece are having an inevitable impact on health with increasing rates of suicide and HIV already apparent. The ability of public services and third sector organisations to continue to meet needs of individuals and communities at times of contraction in the economy is significantly impaired. If we are to avoid health and social inequalities continuing to widen, we need better ways of working.

Alternative ways of working

Every community has assets. Harrison and colleagues (2004) have defined assets as the collective resources which individuals and communities have at their disposal, which protect against negative health outcomes and promote health status. These assets can be social, financial, physical, environmental, or human resources, for example, employment, education, and supportive social networks. The principal assets are those of the individuals living in the community. Those individuals may not be aware they possess many assets and, if they are, they may not use them to any particular purpose. However, everyone has resources at their disposal which can act to protect them against adverse circumstances and which can promote health and wellbeing.

What are health assets?

Many authors have attempted to define assets. A useful review of the literature on assets has been produced by McLean (2011). It is impossible to be comprehensive since anything is an asset which enhances wellbeing. Foot and Hopkins (2010) have suggested that community assets can include:

- the practical skills, capacity and knowledge of local residents
- the passions and interests of local people that give the energy to change
- the networks and connections in a community
- the effectiveness of local community and voluntary associations
- the resources of public, private and third sector organisations that are available to support a community
• the physical and economic resources of a place that enhance wellbeing.

Others have described health assets as being both innate and acquired (Rotegard et al., 2010). They include individuals’ genes, values, beliefs and life experiences. Thus, it is possible to define health promoting or protecting assets very widely. They belong to many domains of life including our individual characteristics, our social circumstances, the environmental conditions in which we live and work, the behavioural choices we make and the health and public services with which we engage.

The asset based approach sets out to work with individuals to make visible their skills and give them confidence that they are valued. Critically, it allows people to become connected with each other and encourages a spirit of cooperation and caring for one another. Communities in which violence, drug addiction and crime are common are often full of suspicion and mistrust. As confidence and self-esteem builds in individuals, neighbours learn to trust each other and community cohesion is built.

The assets approach is not an alternative to public services. It complements them. However, the balance is wrong. If asset based approaches are to be implemented, there needs to be a rebalancing between directly meeting needs of people and communities and nurturing their strengths and resources. If this approach is to become an integral part of mainstream development thinking, it will require a change in individual and organisational attitudes and practice. Instead of doing things to communities, public services need to develop a mind-set which sees them working with individuals and communities to co-create health and wellbeing.

Asset based approaches, however, are not an alternative to investment in service improvement or addressing the structural causes of health inequalities. Individuals trying to build lives for themselves need access to affordable housing. They need access to good education for their children. They need to feel safe in their communities. They need the chance to lead healthy lives through access to opportunities for physical activity and to buy healthy food.
The asset approach in practice

Positive approaches for improving health are not new. The concept has been used extensively over the last few decades and similar approaches have been used by many different communities around the world. In 1986, the World Health Organisation agreed the Ottawa Declaration on Health Promotion. It defined health promotion as:

“...the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realise aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasising social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy life-styles to well-being.”

This is the language of the assets approach. The declaration goes on to assert the importance of a sense of control. “People cannot achieve their fullest health potential unless they are able to take control of those things which determine their health.”

The term ‘health asset’ is used in psychology (Petersen and Seligman, 2004), social sciences (Kolm, 2002) and in public health (Murray and Chen, 1993; Halfon and Hochstein, 2002; Friedl et al. 2005). The community development movement which has grown and spread throughout the world is based on asset principles. The characteristic which distinguishes the assets approach from community development is the focus on the individual as the agent who changes communities. Transformational change begins with individuals coming together to decide how they would like their community to look in future. What happens next usually depends on those individuals and how they grow their network through connecting to others.

Asset mapping

How might communities be best supported in taking forward their vision? Morgan and Ziglio (2007, 2010) emphasise the importance of asset mapping as a starting point. The idea of mapping what resources exist in communities is a way of promoting effective implementation of equity focused policies. Asset mapping, essentially, assesses community capacity to engage in health development activities. It allows individuals to develop policies and activities based on an understanding, or ‘map’, of the community’s resources – individual capacities and abilities, and organisational resources with the potential for promoting personal and community development. Critically, the ‘mapping’ is designed to promote connections or relationships between individuals, between individuals and organisations, and between organisations and organisations (Michigan State University 1998).

A further advantage of asset mapping is that it provides a starting point for taking action in a way which builds trust between professionals and local communities. This is often a difficulty as professionals may be resistant to letting go of power and
the mapping process allows both sides to see opportunities for constructive change. Community asset-mapping illustrates the differences between the traditional approach of needs assessment and the asset approach, which identifies three distinct categorisations of assets:

*Primary building blocks*: which are the assets and capacities located inside the neighbourhood and largely under neighbourhood control (e.g. skills, talents and experience of residents, citizen associations etc).

*Secondary building blocks*: assets located within the community but largely controlled by outsiders (physical resources such as vacant land, energy and waste resources, public institutions and services).

*Potential building blocks*: resources originating outside the neighbourhood and controlled by outsiders (e.g. public capital for regeneration).

Good needs assessment should provide a means of identifying needs of a given population to inform decisions about service delivery. Combined with this more traditional way of measuring need, asset mapping can provide an understanding of how best to create the conditions required to maximise potential in a community.

### Measuring progress

Asset mapping also helps us to conceptualise those things communities want to improve whether they are in the physical, social, emotional, economic or cultural environment. In doing so, mapping begins the process of identifying the most appropriate “asset indicators” to be used in the evaluation of strategies aimed at creating the conditions for health. Measuring the impact of asset based approaches on health outcomes is complex, and evidence of the effectiveness of these approaches at present largely comes from case studies and small scale exploratory research.

### Examples

Asset based approaches can be applied using a number of techniques. Many have not been developed with an assets perspective in mind, however, common features are that these techniques focus on identifying and sharing what individuals and communities have to offer that might enhance health and wellbeing. Different methods are often used in combination with one another and it is not unusual to find many being used in the same community. Two of the best know examples are *Asset Based Community Development (ABCD)* which is, as its name suggests, focused firmly on community utilisation of assets and *coproduction* which was not developed using the language of assets but, on examination clearly uses an assets type of approach.

### Asset Based Community Development (ABCD)

ABCD is an approach to community based development based on the principles of understanding and valuing how the talents, skills and assets of individuals (rather than their problems and needs) can contribute to the realisation of a common vision for a community. It is important to realise that it is a community led development rather than a development driven by external agencies (Cunningham and Mathie, 2002). A number of principles underpin ABCD:

- Appreciative inquiry which identifies and analyses past successes, strengthening confidence and inspiring action
- The recognition of social capital (the connections within and between social networks) and its importance as an asset
• Participatory approaches to development based on the principles of empowerment and ownership of the development process
• Collaborative community development models that place priority on making the best use of the community’s resource base
• Efforts to strengthen civil society by engaging people as citizens in community development, making local services more effective and responsive (Mathie and Cunningham, 2002).

The ABCD process starts with communities making an inventory of assets and capacity. In developing a common vision for the future, enduring relationships are formed and internal and external resources are identified to support actions to achieve the common vision. Building on skills of local people, harnessing the support and power of local associations and by engaging the supportive functions of local institutions and services, asset based community development draws upon existing and, often, unappreciated strengths to build stronger, more sustainable communities. By encouraging pride in achievements and a realisation of what they have to contribute, communities create confidence in their ability to be producers not simply recipients of development (Foot and Hopkins, 2010).

Co-production

Co-production is the process of active dialogue and engagement between people who use services and those who provide them. It is a process which puts service users on the same level as the service provider. It aims to draw on the knowledge and resources of both to develop solutions to problems and improve interaction between citizens and those who serve them (SCDC, 2011), (Needham and Carr, 2009). The key characteristics of co-production exemplify asset based principles (Stephens et al., 2008):

• Recognising people as assets rather than as problems
• Building on people’s existing skills and resources
• Promoting reciprocity, mutual respect and building trust
• Building strong and supportive social networks

• Valuing working differently, facilitating rather than delivering
• Breaking down the divisions between service providers and service users.

Co-production changes the dynamics between individuals and communities, creating more collaborative relationships. Frontline staff are more able and confident in sharing power and are more ready to accept user expertise (Needham and Carr, 2009). Co-produced services work with individuals in a way that treats individuals as people with unique needs, assets and aspirations, but also as people that want support tailored to their needs (Slay and Robinson, 2011). Services learn to work with people and not do things to them.

Asset based approaches are concerned with identifying the protective factors that support health and wellbeing. They offer the potential to enhance both the quality and longevity of life through focusing on the resources that promote the self-esteem and coping abilities of individuals and communities. Society could benefit from a more concerted effort to conduct its activities in this way.
The way ahead for Scotland?

The recently published report of the Commission on the Future Delivery of Public Services in Scotland (Christie, 2011) has also spoken of the need to work differently in Scotland. The Commission is firm in its view that “irrespective of the current economic challenges, a radical change in the design and delivery of public services is necessary to tackle the deep-rooted social problems that persist in communities across the country”. A programme of reform is necessary to ensure that “public services are built around people and communities, their needs, aspirations, capacities and skills, and work to build up their autonomy and resilience” (Christie, 2011). This reform cannot succeed unless individuals, communities and public organisations work together in designing and coproducing the services they use. Both public services and communities will need to find a new balance in their relationship if health and wellbeing is to be enhanced in our society.
CHAPTER 6
Significant trends in the incidence of the communicable diseases of public health importance in 2010

Introduction
Infections continue to be a major public health problem in Scotland. Although significant progress has been made in reducing their impact, much remains to be done to reduce disease further. This chapter summarises significant trends in the incidence of the main communicable diseases of public health importance in 2010, as well as summarising progress in Scotland aimed at the management of two significant conditions namely tuberculosis and E. coli O157.

Gastro-intestinal infections
Trends in gastro-intestinal infections are mixed. Of most concern is the ongoing rise in campylobacter infection which remains the most common of the more severe GI infections. Its control is a Food Standards Agency priority. In 2010 a total of 6,597 isolates of campylobacter were reported to Health Protection Scotland (HPS), which is an increase of 182 (2.8%) compared to the 6,415 reports in 2009. The increase in 2010 was considerably less than in the previous year when reports had increased by 1,537 (31.5%). The total of 6,597 reports in 2010 is higher than the previous peak in the incidence in Scotland in 2000 when there had been 6,482 reports. No obvious reason for this increase has so far been identified.

Trends in E. coli O157 infection show some improvement. In 2010, there was a provisional total of 212 culture positive cases of escherichia coli O157 reported to HPS during 2010, a decrease of 25 (11%) compared to 237 cases in 2009. This was the lowest annual total since 2005. The rate of reports for the whole of Scotland was 4.1 per 100,000 population in 2010, compared to 4.6 per 100,000 in 2009.

The rate of salmonella infection in Scotland was 18.1 per 100,000 population; an increase from that in 2009 (16.4 per 100,000) which had seen a substantial decline. Historically, rates of salmonella infection are low as shown below in Figure 14.

Figure 14: Annual totals of isolates of main GI bacterial pathogens notified to HPS, 2001-2010

Source: Health Protection Scotland
Norovirus (NV) infection is the most common of the less severe GI infections in Scotland. The trend is increasing (see Figure 15). The overall rate of reports of NV in 2010 was 59.9 per 100,000 compared to 43.3 per 100,000 in 2009. During 2010, 344 general outbreaks of NV infection were reported to ObSurv, the surveillance system for all general outbreaks of infectious intestinal disease in Scotland. This was an increase of 101 (41.5%) compared to the 243 general outbreaks of NV reported in 2009. In 2010, 51.2% of the general NV outbreaks were reported during the first quarter of the year.

**Bloodborne virus and sexually transmitted infection**

Trends for hepatitis C infection are difficult to interpret because of recent changes in the testing regime for screening. However, recent figures during 2009 show that 2,013 new cases of hepatitis C antibody-positivity were diagnosed. This figure compares with 1,553 and 1,725 for 2007 and 2008, respectively as shown in Figure 16. Of the 2009 cases, 47% (939) are known to have injected drugs, representing 90% of those with a known risk factor. At the time of diagnosis, 25% (510) were aged 20-29 years, 37% (749) were aged 30-39 years, 25% (498) were aged 40-49 years, 8% (163) were aged 50-59 years and 3% (60) were aged over 60 years. This brings the total to 27,355 cases of hepatitis C antibody-positivity ever diagnosed as at 31 December 2009, of whom 14% are known to have died. Approximately one in 220 of Scotland’s population had been diagnosed hepatitis C antibody-positive. It is estimated that the number of undiagnosed hepatitis C antibody-positive cases in Scotland still exceeds the number of diagnosed cases.

**Figure 15: Laboratory reports of norovirus to HPS, 2001-2010**

![Graph showing laboratory reports of norovirus to HPS, 2001-2010](image)

**Figure 16: Number of persons reported to be hepatitis C antibody positive in Scotland, 1999-2009**

![Graph showing number of persons reported to be hepatitis C antibody positive in Scotland, 1999-2009](image)

Source: Health Protection Scotland
The general trend for HIV infection is also upwards. During 2010, NHSScotland laboratories reported positive HIV-antibody test results for 360 individuals not previously recorded as HIV-positive in Scotland. The cumulative number of HIV-positive individuals ever reported in Scotland is now 6,613, of whom 4,774 (72%) are male and 1,839 (28%) are female. At least 1,783 (27%) are known to have died. Allowing for known and presumed migration of cases, it is estimated that there are currently 3,803 persons living in Scotland who have been diagnosed HIV-positive.

Of the 360 reported HIV-positive individuals in 2010, 251 (70%) are male, and 232 (64%) are aged between 25 and 44 years. The probable route of transmission was men who have had sex with men (MSM) in 130 cases, heterosexual intercourse in 151 cases, and injecting drug use in 19 cases. Of the heterosexual cases, 107 probably acquired their infection abroad. For 53 cases, the transmission category is, as yet, undetermined. Greater Glasgow & Clyde accounted for 118 cases, 92 were from Lothian, 37 from Grampian, 28 from Lanarkshire, and 26 from Tayside.

Of the 360 cases reported during 2010, 174 (48%) are presumed to have acquired their infection outwith Scotland. This compares with 2,690 (41%) of the 6,613 cumulative total of HIV-positive individuals reported in Scotland. The annual trends in reporting of HIV cases are shown in Figure 17 below.

Trends in all the other sexually transmitted infections are on the whole rising although the situation is less clear for syphilis.

**Healthcare Associated Infections**

A reduction in healthcare associated infections has been observed over the last three years. Despite this, such infections continue to place a significant burden on the population both in and out of hospital. They require continuing monitoring, targeted infection prevention and control measures and prudent antimicrobial prescribing to reduce the risk to a minimum.
Progress has been made. During 2010, a total of 1843 new cases of *staphylococcus aureus* (*S. aureus*) bacteraemia were identified. The majority of these bacteraemias were due to meticillin sensitive *S. aureus* (MSSA) (n=1492, 81%) and around one fifth due to meticillin resistant *S. aureus* (MRSA) (n=351, 19%). The annual incidence rate of *S. aureus* bacteraemia in terms of acute occupied bed days (AObDs), showed a decrease of 9% compared with 2009. MRSA bacteraemia and MSSA bacteraemia rates have reduced year on year between 2005 and 2010 by 17.7% and 1.5% respectively.

The proportion of *S. aureus* bacteraemias due to MRSA has significantly reduced from 24% to 19% in the last year (quarterly rates are shown in Figure 18). The majority of MRSA isolates (82%) typed by the Scottish MRSA Reference Laboratory, as part of the snapshot (representative surveillance) programme in 2010, were attributable to the epidemic strain EMRSA-15.

During 2010, good progress was also made in respect of *clostridium difficile* infection (CDI). A total number of 2219 new cases of CDI were identified in patients aged 65 years and over. This is a 33% decrease in comparison with the 3634 cases reported in 2009. The annual incidence rate in patients aged 65 years and over was 0.44 per 1000 total occupied bed days which is a decrease of 38% compared to 2009. Mandatory surveillance in the age group 15 to 64 years was introduced in April 2009. The number of cases reported in 2010, the first full calendar year of surveillance was 692 with an annual incidence rate of 0.45 per 1000 acute occupied bed days. Recent yearly trends are shown in Figure 19.
The total number of new cases of surgical site infection (SSI) following the procedures of hip arthroplasty and caesarean section surgery were 104 and 429 respectively. The incidence of SSI during 2010 was 1.1% for hip arthroplasty and 2.8% for caesarean section procedures and includes cases identified following discharge from hospital. Almost half of all SSI following hip arthroplasty surgery were detected on readmission to hospital in 2010 and the proportion of caesarean section SSI detected by post discharge surveillance to day ten was 88%.

Rates of inpatient infection in the hip arthroplasty and caesarean section surgery categories have significantly reduced since surveillance became mandatory in 2001 but have remained relatively stable over the last three years of reporting, 2008-2010.

Figure 19: Quarterly CDI rates for Scotland (per 1000 total bed days) in patients aged 65 years and over, October 2006 to December 2010

Source: Health Protection Scotland
Vaccine preventable diseases

As measles has become rare in Scotland due to the effectiveness of the childhood immunisation programme, it has become difficult to diagnose individual cases clinically without laboratory tests. There were 86 notifications for measles in Scotland in 2010 and ten laboratory confirmed cases. In every year, the majority of measles cases occur in unimmunised individuals. Numbers of measles cases though remain low especially compared to other parts of the UK and Western Europe.

Since 2004 there has been an ongoing widespread outbreak of mumps which has affected all areas of the UK. Although cases have fallen overall since the peak in 2005, mumps cases continue to occur steadily in Scotland. Mumps mainly affects the young adult age group (aged 15-24 years), who are often under immunised against mumps as they have not routinely been offered two doses of MMR vaccine. In the whole of 2010 as seen in Figure 21, there were 466 laboratory confirmed cases of mumps, down from 709 confirmed cases in 2009.

The median age of cases in 2010 was 21 years (range 0-76 years). 66% of laboratory confirmed cases were in the age band 15-24 years.
There have been no reported cases of meningococcal serogroup C infection since four cases were reported in 2007, continuing to show the effectiveness of the meningitis C vaccine campaign. A total of 99 cases of other types of meningococcal infection were reported to HPS in 2010 (Figure 22). This is a welcome reduction from that reported in 2009 (139 cases) and 2008 (125 cases) and is the lowest number of cases reported since this type of surveillance was introduced in 1999. Meningococcal disease occurs more frequently in younger age groups: 46.0% (64 cases) were aged less than five years.
Pneumococcal conjugate vaccine (PCV-7) has been part of the routine childhood immunisation schedule since September 2006. The PCV-7 vaccine has now been replaced in late spring 2010 with an updated PCV-13 vaccine which offers protection against more subtypes of pneumococcal disease. Of the Invasive Pneumococcal Disease (IPD) cases provisionally reported in 2010, 28 were in children under five years of age and eligible for PCV vaccination. This is slightly lower than the number of cases reported in this age group in 2008 and 2009 (34 and 39 cases respectively) but much less than the number of cases reported before the introduction of PCV in 2005 when 95 cases were reported. A decline is also being seen in incidence for the over 65s (Figure 23).

This decline is very welcome with a large reduction in both invasive and non-invasive disease incidence due to vaccine serotypes in both vaccinated and to a lesser degree in older unvaccinated populations and is thought to be due to ‘herd immunity’ with less organisms circulating overall as protection in children increases.
**Tuberculosis**

In 2010 the HPS surveillance scheme received 506 provisional notifications of tuberculosis, an incidence of 9.7 cases per 100,000 population (95% CI 8.9-10.6). This was an increase of 4.1% in the number of cases and an increase of 3.2% in the incidence rate per 100,000 population when compared with 2009. There has been a continued increase in the number of tuberculosis cases and incidence reported since 2005 (Figure 24). This is in contrast to a decreasing number of cases reported in England (6.7%) and the whole of the UK (6.2%) in 2010.

In recent years Scotland has had a relatively low and stable incidence of tuberculosis. Compared with other parts of the UK and Europe the disease has not been a significant problem. However, the recent epidemiological evidence suggests that the picture may be changing. While tuberculosis is still at lower levels than elsewhere in the UK, the numbers of cases we are now seeing are suggestive of an increasing incidence.

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**Figure 23: Cases of IPD reported to SPIDER by quarter and by age group, 1999-2010***

**Figure 24: Numbers of tuberculosis cases and incidence in Scotland, 2000-2010***

*Data for 2008-2010 are provisional and may be subject to change*
To address this trend in Scotland, work began in 2010 on ‘A TB Action Plan for Scotland’. The intention of this Action Plan is to ensure that Scotland provides the best quality clinical, laboratory and public health services in relation to tuberculosis, and that these are underpinned by the best possible surveillance and epidemiology. The intention is not just to stabilise the incidence of tuberculosis in Scotland but to significantly reduce the burden of ill health caused by this serious disease.

A debt of gratitude is owed to the Working Group and Sub-Groups that developed this Action Plan. It attempts to carry on the model of exemplary work that the late Sir John Crofton took forward in Scotland half a century ago. The recommendations within this Action Plan will be testing and demanding. Determination will be required to ensure progress is maintained and outcomes are achieved. Progress will be reported in future CMO annual reports.

**Zoonoses**

One concerning trend in zoonoses, i.e. diseases that can be transmitted from animals to humans, is that shown by the increase in lyme disease, a tickborne disorder. The rise cannot be accounted for purely by changes in laboratory protocols or in the number or demographics of patients tested. Variations in climatic conditions and alterations in clinical presentations may have contributed to this continuing rise year on year. This is also likely to be impacted by improved recognition and clinical suspicion.

![Figure 25: Number of cases of lyme disease in Scotland, 2001-2010](source: Health Protection Scotland)
**E. coli O157**

*Escherichia coli* O157 (*E. coli* O157) is the most common serogroup of verotoxigenic *E. coli* (VTEC) identified in humans in Scotland and the rest of the UK. Over recent years it has caused a considerable burden of infections due to its tendency to result in complications. VTEC infection can be asymptomatic, or may cause a spectrum of illness from mild non-bloody diarrhoea, through bloody diarrhoea, and haemorrhagic colitis to Haemolytic Uraemic Syndrome (HUS), other presentations of Thrombotic Microangiopathy (TMA), and can even result in death. There have been many infections and some notable outbreaks as a result of VTEC. The Pennington Report was the first major review following the Central Scotland *E. coli* O157 outbreak in 1996. There have been other outbreaks and enquiries into VTEC since then throughout the UK. The Scottish Executive (which became the Scottish Government in 2007) and the Food Standards Agency (Scotland) subsequently formed a joint Task Force on *E. coli* O157.

In 2001, the Task Force reported a number of recommendations to be implemented in Scotland. In 2002, a joint Scottish Executive/Food Standards Agency (Scotland) Action Plan agreed that recommendations should be progressed further, but timescales were not agreed and some were not allocated to specific agencies. Although most recommendations were implemented, the number of *E. coli* O157 infections has remained at approximately 240 cases per year in recent years.

Over the years, there have been a number of reviews to ensure that progress on the Task Force recommendations is maintained. Most recommendations had indeed been progressed but in some, progress was difficult to identify and work was needed to decide if they were still applicable and if they were being actioned. The latest review suggested that a VTEC Action Group be formed to reconsider how VTEC is controlled in Scotland. The remit of the group would be to identify what actions need to be taken forward, who would be responsible for the actions and the agreed timescales in which they should be completed.

2010 saw the establishment of this Action Group which is aiming to produce by the end of March 2012, a definitive VTEC Action Plan for 2012-2015, identifying priorities and recommendations to specified stakeholder groups, to be implemented within agreed timescales. This aims to reduce the risk and consequences of VTEC infection to the Scottish population and involves the welcome assistance of many key stakeholders, e.g. Scottish Government Directorates, Health Protection Scotland, NHSScotland, Food Standards Agency (Scotland), Local Authorities, Drinking Water Quality Regulator (Scotland). We will aim to report progress in subsequent annual reports.

**Conclusion**

Infectious diseases still pose a considerable threat to the population of Scotland with significant numbers of people having to attend their GP or being admitted to hospital as an emergency. 2010 has seen welcome reductions in the levels of some infections especially healthcare associated infections and vaccine preventable diseases. However the rise in the number of new cases of tuberculosis, HIV, hepatitis C, campylobacter infection, gonorrhoea, chlamydia and lyme disease demonstrates the continuing need for action on the underlying reasons as to why people are falling ill with these conditions, our management responses to such threats and on the prevention of onward transmission of infection from them.
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