Scottish Heart Disease Statistics
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Introduction

Despite a substantial reduction in the rate of death from coronary heart disease (CHD) over the last decade, it remains one of the leading causes of death in Scotland (Health of Scotland’s population - Mortality Rates). In 2015, there were 7,142 deaths in Scotland where CHD was the underlying cause. The disease is caused when the heart’s blood vessels, the coronary arteries, become narrowed or blocked and cannot supply enough blood to the heart.

Scotland has a high prevalence of the risk factors associated with heart disease, such as smoking, poor diet and physical inactivity. Overall, it is estimated that around 7.5% of men and 4.6% of women are living with CHD (Scottish Health Survey 2015). Treating and preventing heart disease is a national clinical priority for Scotland. 1

The Scottish Heart Disease Statistics publication is produced annually to provide information on a range of different heart conditions in Scotland including:

- All heart disease
- Acute myocardial infarction (a medical term for a heart attack)
- Angina
- Heart failure
- Coronary heart disease (also referred to as ischaemic heart disease, a collective term that includes angina, heart attack and heart failure)

and the different types of procedures used to diagnose and treat heart disease, including:

- Angiography: a procedure to examine the coronary arteries
- Angioplasty: or percutaneous transluminal coronary angioplasty, a procedure to widen narrowed coronary arteries
- Coronary artery bypass graft: a procedure to replace narrowed coronary arteries with grafts.

This update contains information on hospital activity, incidence, operations, 30 day survival following first emergency admission, GP prescribing and ambulance service activity up to the period 1 April 2015 - 31 March 2016, and mortality up to the period 1st January - 31st December 2015. The update also includes Quality Outcomes Framework (QOF) data from general practices.

Information is presented at NHS Board level with some tables (activity and mortality) also available at Local Council Area level.

1 Heart Disease Improvement Plan, August 2014
Main points

- There has been a steady downward trend in deaths from coronary heart disease in Scotland and the rest of the UK over the last ten years. In Scotland, the mortality rate fell by 37.6% between 2006 and 2015. However, coronary heart disease is still a leading cause of death and a national clinical priority for Scotland.

- The incidence rate for coronary heart disease decreased over the past decade by 27.3%. Incidence rates for coronary heart disease remain consistently higher in males than females.

- The reduction in all-age mortality rates for coronary heart disease was seen in both the most and least deprived communities. The percentage reduction in deaths in the most deprived category (31.3%) over the last ten years was smaller than that in the least deprived category (38.5%).

- For an individual admitted to hospital as an emergency with their first heart attack, their chances of surviving at least 30 days improved over the last ten years from 84.9% to 92.9%.

- The number of prescriptions for drugs to treat diseases of the circulation increased by 6.6% in the last ten years. Despite this, the cost of prescriptions dispensed for these drugs has fallen by 44.6% over the last ten years to £116.8 million in 2015/16, reflecting falls in drug prices for these conditions.
Results and Commentary

Hospital Activity

Discharges

This section of the report examines the number of discharges from hospital with a specific heart disease condition.

Figures on discharges provide an indication of hospital usage for the diagnosis and treatment of heart disease in either an inpatient or day case setting but exclude activity relating to outpatients. Age and sex adjusted discharge rates are presented here. Further information is available in Appendix A1.

Coronary Heart Disease (CHD)

In the last decade, there was a decreasing trend in the number of discharges from hospital with CHD. Between 2006/07 and 2015/16, the age and sex adjusted discharge rate fell by 13.5% from 1,118 to 968 per 100,000 population. The actual number of discharges remained fairly steady at just under 50,000 discharges per year.

Figure 1: Discharges from hospital with coronary heart disease; Age and sex adjusted discharge rates per 100,000 population

Notes: 1. Analysis includes ICD-10 codes I20-I25.
2. Rates are directly standardised to the 2013 European standard population.
3. Data are provisional for 2015/16 and are subject to change in future analyses.
Data Source: ISD SMR01 - discharges; National Records Scotland – population estimates.

See Appendix A1 for details of completeness of hospital activity figures derived from SMR01 records.

Note that a patient can have more than one discharge from hospital within a given time period.
The adjusted discharge rate for females was less than half that for males in 2015/16 and there was a larger percentage decrease for females over the last decade (16.2% for females compared to 12.1% for males).

The percentage decrease in the rate was larger in the under-75 age group (16.7%) than in the over-75 group (7.2%).

Comparing mainland NHS Boards, in 2015/16 the adjusted discharge rate was lowest in NHS Lothian (618 per 100,000 population) and highest in NHS Lanarkshire (1,347 per 100,000 population).

Tables AC1 and AC4 provide more detail at NHS Board and Council level.

**Heart Attacks**

The age and sex adjusted rate for a diagnosis of heart attack (myocardial infarction) increased from 375 per 100,000 population in 2006/07 to 518 per 100,000 population in 2015/16, an increase of 37.9%.

As noted in previous publications, there was a decrease in the number of discharges from hospital with a diagnosis of heart attack up to 2007/08. There was then a large increase in the number of discharges with a diagnosis of heart attack between 2007/08 and 2010/11. Since 2010/11, the number of discharges remained relatively stable (Table AC1 and Figure 2).

![Figure 2: Discharges from hospital with a diagnosis of heart attack](image)

**Notes:**
1. Analysis includes ICD-10 codes I21-I22.
2. Rates are directly standardised to the 2013 European standard population.
3. Data are provisional for 2015/16 and are subject to change in future analyses.

Data Source: ISD SMR01 - discharges; National Records Scotland – population estimates.
The increase in the number of discharges from hospital with a diagnosis of heart attack since 2007/08 was likely to be due to a change in the way that heart attacks are diagnosed. The more sensitive troponin blood test is now routinely used to diagnose heart attacks. This means that some cases that might previously have been diagnosed as angina or another similar condition may now be classified as a heart attack. It is not possible to calculate the number of additional cases diagnosed because of the use of the troponin test. More information on this test is provided in the background information in Appendix A1.

**Angina**

Angina is chest pain on exertion as a result of CHD. In the period 2007/08 to 2011/12, there was a general downward trend in the adjusted discharge rate for angina. Since 2011/12 the rate has remained fairly stable. The age and sex adjusted discharge rate was 266 per 100,000 population in 2006/07 compared to 156 in 2015/16, a decrease of 41.6% (Figure 3).

![Figure 3: Discharges from hospital with a diagnosis of angina; Age and sex adjusted discharge rates per 100,000 population](image)

Notes:  
1. Analysis includes ICD-10 codes I20 and I24.9.  
2. Rates are directly standardised to the 2013 European standard population.  
Data are provisional for 2015/16 and are subject to change in future analyses.

Data Source: ISD SMR01 - discharges; National Records Scotland – population estimates.

The percentage decrease in the standardised rate was larger in the under 75 age group (45.3%) compared to the over 75 age group (34.6%) - Table AC1 and Table AC4.
**Heart Failure**

Heart failure occurs when the heart cannot provide sufficient pump action to meet demand. The age and sex adjusted discharge rate increased by 24.7%, from 265 per 100,000 population in 2006/07 to 330 in 2015/16. (Figure 4 and Table AC1).

**Figure 4: Discharges from hospital with a diagnosis of heart failure¹; Age and sex adjusted discharge rates per 100,000 population²**

![Graph showing heart failure discharge rates over time]

Notes: 1. Analysis includes ICD-10 codes I50.
2. Rates are directly standardised to the 2013 European standard population. Data are provisional for 2015/16 and are subject to change in future analyses.

Data Source: ISD SMR01 - discharges; National Records Scotland – population estimates.

**Chest Pain**

Chest pain can be symptomatic of other heart conditions. In the last ten years, the age and sex adjusted discharge rate for chest pain decreased from 752 per 100,000 population in 2006/07 to 713 in 2015/16, a decrease of 5.2% (Figure 5 and Table AC1).

The discharge rate increased slightly over the last decade by 1.2% for females but decreased in males by 10.4%. There was a larger decrease in the under-75 age group (6.6%) than in the over-75 age group (0.4%).
Figure 5: Discharges from hospital with a diagnosis of chest pain\(^1\); Age and sex adjusted discharge rates per 100,000 population\(^2\)

Notes:
1. Analysis includes ICD-10 codes R07.
2. Rates are directly standardised to the 2013 European standard population.
   \(^p\) data are provisional for 2015/16 and are subject to change in future analyses.

Data Source: ISD SMR01 - discharges; National Records Scotland – population estimates.

Details of hospital activity for all heart disease, angina, chest pain, CHD, heart attacks and heart failure by age, gender, type of admission and NHS board area are given in Table AC1. Corresponding information by council area can be found in Table AC4.
Incidence

Incidence is the number of new cases of a specific condition in a population during a defined time-period. It is presented here as the number of people with a first hospital admission for CHD (or death from CHD without a prior admission to hospital). Information has been provided for CHD and heart attacks as it is likely that people with these conditions would be admitted to hospital. Further information is available in the glossary.

Coronary Heart Disease (CHD)

The number of new cases of CHD decreased over the past decade. The age and sex adjusted incidence rate decreased by 27.3% from 498 per 100,000 population in 2006/07 to 362 in 2015/16 (Figure 6).

Figure 6: Coronary Heart Disease
Age and sex adjusted incidence rates per 100,000 population

Notes:
1. Analysis includes ICD-10 codes I20-I25
2. Rates are directly standardised to the 2013 European standard population.
   Data are provisional for 2015/16 and are subject to change in future analyses.
Data Source: ISD SMR01 - discharges; National Records Scotland – Population

The incidence of CHD increases sharply with age. The age and sex adjusted incidence rate for the under 75 age group in 2015/16 was 230 per 100,000 population but for the over-75 age group, it was 1,694 per 100,000 population (see Table IC1).

Across all age groups presented in this publication, males were more likely than females to have a new diagnosis of CHD. The adjusted incidence rate has fallen more steeply for females (32.8%) over the last ten years than for males (24.2%) (Table IC1).

Comparing mainland NHS Boards, in 2015/16 the adjusted incidence rate was lowest in NHS Lothian (315 per 100,000 population) and highest in NHS Ayrshire & Arran (426 per 100,000 population) (Table IC1).
**Heart Attacks**

The age and sex adjusted incidence rate for heart attacks decreased by 16.8% from 262 per 100,000 population in 2006/07 to 218 in 2015/16. The incidence rate increased between 2007/08 and 2010/11. As previously noted, this was likely to be due to the introduction of more sensitive tests for diagnosis (see Appendix A1 for more information).

![Figure 7: Heart attack](image)

**Figure 7: Heart attack**

*Age and sex adjusted incidence rates per 100,000 population*

Notes: 1. Analysis includes ICD-10 codes I21-I22
2. Rates are directly standardised to the 2013 European standard population.
3. Data are provisional for 2015/16 and are subject to change in future analyses.

Data Source: ISD SMR01 - discharges; National Records Scotland – Population

Details of incidence of CHD and heart attacks for Scotland by age and gender are given in Table IC1 and Table IC2.
Operations

In CHD, the blood supply to the heart is reduced or blocked. Two types of operation are used to improve the flow of blood to the heart. These are Coronary Artery Bypass Grafts (CABG) and angioplasties (Percutaneous Transluminal Coronary Angioplasty - PTCA).

A CABG is an operation in which a blood vessel from another part of the body is grafted to the coronary artery or arteries, to bypass narrowed sections and restore blood flow to the heart muscle. This involves a general anaesthetic and major open surgery.

An angioplasty involves passing a thin, hollow tube into the coronary arteries from an artery in the groin or arm. A device on the tube is then used to unblock the artery, and stretch the artery walls so that blood and oxygen can flow to the heart muscle. A small tube (or stent) may be left inside the vessel to ensure that it stays open. An angioplasty has the advantage that it is generally regarded as a less major procedure than a CABG.

Details of hospital activity for CABG, angioplasty, angiography and valve surgery by age, gender, type of admission and NHS board are given in Table OC1.

Coronary Artery Bypass Grafts

Over the last decade there was a decrease in the number of CABG operations. The age and sex adjusted hospital discharge rate decreased from 53 per 100,000 population in 2006/07 to 25 per 100,000 population in 2015/16, a reduction of 52.1% (Table OC1 and figure 8).

Figure 8: Coronary Artery Bypass Grafts

*Age and sex adjusted discharge rates per 100,000 population*

Notes:  1. Analysis includes OPCS codes K40-K46 (main A position only)
       2. Rates are directly standardised to the 2013 European standard population

Data Source: ISD SMR01 - discharges; National Records Scotland – Population

p = Provisional
Angioplasties

The general downward trend in the number of CABG operations reflects the increasing use of angioplasties in the treatment of CHD. The age and sex adjusted hospital discharge rate for angioplasties increased from 127 per 100,000 population in 2006/07 to 160 in 2015/16, an increase of 26.2% (Table OC1 and figure 9).

Figure 9: Angioplasty
Age and sex adjusted discharge rates per 100,000 population

Notes: 1. Analysis includes OPCS codes K49, K50, K75 (any A position)
2. Rates are directly standardised to the 2013 European standard population
Data Source: ISD SMR01 - discharges; National Records Scotland – Population
p = Provisional

CABG and angioplasty are collectively known as revascularisation procedures. The age and sex adjusted hospital discharge rate for revascularisation procedures increased slightly over the last 10 years from 180 per 100,000 population in 2006/07 to 186 in 2015/16, an increase of 3.2% (Table OC1 and figure 10). However, this slight increase should be set in the context of the marked fall in CHD incidence shown in figure 6.
Figure 10: Revascularisation
Age and sex adjusted discharge rates per 100,000 population

Notes: 1. Analysis includes OPCS codes K40-K46 (main A position only); K49, K50, K75 (any A position)
2. Rates are directly standardised to the 2013 European standard population
Data Source: ISD SMR01 - discharges; National Records Scotland – Population
p = Provisional

Coronary Angiography

Coronary angiography is carried out to diagnose coronary artery disease and also as part of its treatment, for example when angioplasty is carried out.

For diagnostic angiographies (angiography with no associated angioplasty), there was a general downward trend in the last decade. The age and sex adjusted hospital discharge rate dropped from 286 per 100,000 population in 2006/07 to 196 in 2015/16, a reduction of 31.5% (Table OC1 and figure 11).

For diagnostic angiographies used to assist in treatment (angiographies done in association with angioplasty), the adjusted hospital discharge rate increased from 83 per 100,000 population in 2006/07 to 139 in 2015/16, an increase of 67.6%. This reflects the increased use of angioplasties in the treatment of CHD (Table OC1 and figure 12).
Figure 11: Diagnostic angiography with no associated angioplasty¹
Age and sex adjusted discharge rates per 100,000 population²

![Graph showing diagnostic angiography with no associated angioplasty](image)

Notes: 1. Analysis includes OPCS codes K63, K65, U10.2, U10.5 (any A position)
2. Rates are directly standardised to the 2013 European standard population
Data Source: ISD SMR01 - discharges; National Records Scotland – Population
p = Provisional

Figure 12: Diagnostic angiography in association with angioplasty¹
Age and sex adjusted discharge rates per 100,000 population²

![Graph showing diagnostic angiography with angioplasty](image)

Notes: 1. Analysis includes OPCS codes K49, K50.1, K75, K63, K65, U10.2, U10.5 (any A position)
2. Rates are directly standardised to the 2013 European standard population
Data Source: ISD SMR01 - discharges; National Records Scotland – Population
p = Provisional
Survival

Thirty day survival is widely used as a measure of the outcome of hospital admission and reflects the severity of disease as well as the quality of care.

Heart Attacks

The percentage of people who survived 30 days or more following their first emergency admission to hospital with a heart attack improved over the period 2006/07 to 2015/16 (Figure 13). The percentage who survived 30 days for both sexes combined increased from 84.9% in 2006/07 to 92.9% in 2015/16 (Table S1 and Figure 13). Over the same period, there was a narrowing of the gap in the survival between males and females from 9.3 to 5.1 percentage points.

For those aged 75 and over, 30 day survival increased from 71.3% in 2006/07 to 85.5% in 2015/16.

Figure 13: Heart attack¹;  
Percentage of patients surviving 30 days or more after first emergency admission²

Notes: 1. Analysis includes ICD-10 codes I21-I22  
2. y-axis (percentage surviving 30 days) starts at 70% to enable clear comparison between sexes.  
Data Source: ISD SMR01 - discharges; National Records Scotland – Population
Heart Failure

In the last ten years, there was a small increase in the number of people surviving 30 days following a first emergency admission to hospital for heart failure. The percentage surviving 30 days increased from 83.6% to 86.0% during that time (Table S3 and figure 14). For those aged 75 and over, the percentage surviving 30 days increased from 80.1% to 83.4% over the same period.

Figure 14: Heart failure\(^1\);
Percentage of patients surviving 30 days or more after first emergency admission\(^2\)

Notes:  
1. Analysis includes ICD-10 codes I50  
2. y-axis (percentage surviving 30 days) starts at 74% to enable clearer comparison between sexes.  
Data Source: ISD SMR01 - discharges; National Records Scotland – Population
Mortality

All Heart Disease

This section provides information for all heart diseases combined. As well as CHD, this includes disease of the heart valves and high blood pressure as well as other less common conditions like infections of the heart.

There was a small increase in the age and sex adjusted mortality rate from heart disease (including CHD) from 2014 to 2015. The rate rose from 206 per 100,000 population in 2014 to 214 per 100,000 population in 2015 – a 3.9% increase. It should be noted that overall mortality was unusually high in 2015. More details are available in the winter mortality report 2014/15, which was published by NRS. However, the overall trend in the last 10 years in Scotland still shows a decrease in the rate of mortality, from 302 per 100,000 population in 2006 to 214 per 100,000 population in 2015, or a 29.0% decrease (Table MC1 and Figure 15).

Figure 15: All heart disease: all ages by sex 2006-2015
Age and sex adjusted mortality rates per 100,000 population

Notes: 1. Analysis includes ICD-10 codes I00-I52
2. Rates are directly standardised to the 2013 European standard population
Data Source: National Records Scotland - Deaths and Population

The reduction in mortality for all types of heart disease was slightly larger for people under the age of 75 (32.3%) than for people aged 75 and over (25.8%) (Table MC1).

4 The figures included in this section refer to calendar years.
Coronary Heart Disease (CHD)

The British Heart Foundation publishes comparisons of CHD mortality rates within the UK (figure 16). The mortality rates in Scotland have been higher than England, Wales and Northern Ireland over the last 30 years but the absolute gap in mortality rates has narrowed over this time.

Figure 16: Coronary heart disease mortality in United Kingdom, England, Wales, Scotland and Northern Ireland
Age-adjusted mortality rates per 100,000 population

Notes: 1. Rates are directly standardised to the 2013 European standard population

Previous editions of this publication have included comparisons of CHD mortality rates between Scotland, the United Kingdom and the European Union. The source of these comparisons, the Scotland and European Health for All Database, is due to be updated during 2017. The next edition of this publication will include these more up to date comparisons.5

The age and sex adjusted mortality rate for CHD fell from 239 per 100,000 population in 2006 to 149 in 2015, a reduction of 37.6% over the last 10 years (Table MC1 and figure 17).

**Figure 17: Coronary heart disease\(^1\): all ages by sex 2006-2015**

**Age and sex adjusted mortality rates per 100,000 population\(^2\)**

![Graph showing age and sex adjusted mortality rates per 100,000 population for Coronary Heart Disease (CHD) from 2006 to 2015 by sex (males, females, both sexes).](image)

**Notes:**
1. Analysis includes ICD-10 codes I20-I25
2. Rates are directly standardised to the 2013 European standard population

**Data Source:** National Records Scotland - Deaths and Population

Between 2006 and 2015 the reduction in age and sex adjusted mortality rates for CHD was higher for females (40.3%) than males (33.6%). The difference in rates between men and women narrowed from 134 deaths per 100,000 population in 2006 to 101 deaths per 100,000 population in 2015.

Of the mainland NHS Health Boards, NHS Borders had the highest age and sex adjusted mortality rate in 2015 (175 per 100,000 population) while NHS Grampian had the lowest rate (130 per 100,000 population). NHS Fife had the highest percentage reduction in the mortality rate among the mainland Health Boards between 2006 and 2015 (41.4%), while NHS Dumfries & Galloway had the lowest percentage reduction in the mortality rate between 2005 and 2014 (25.7%).
**Heart Attacks**

The age and sex adjusted mortality rate for heart attacks decreased substantially over the last ten years, falling by 46.1% from 137 per 100,000 population in 2006 to 74 in 2015 (Table MC1 and figure 18).

**Figure 18: Heart attacks\(^1\): all ages by sex 2005-2014**

**Age and sex adjusted mortality rates per 100,000 population\(^2\)**

![Graph showing heart attack mortality rates](image)

Notes:  
1. Analysis includes ICD-10 codes I21-I22  
2. Rates are directly standardised to the 2013 European standard population  
Data Source: National Records Scotland - Deaths and Population

Details of mortality from all heart disease, CHD, heart attacks and heart failure by age, gender and health board area are given in Table MC1. Corresponding information by council area can be found in Table MC4.
Deprivation

Heart disease varies greatly between areas of greater or less material deprivation. In Scotland the Scottish Index of Multiple Deprivation (SIMD) is used to measure area deprivation. It is a measurement of multiple deprivation which combines information on income, employment, education, housing, health, crime and geographical access. More information is provided in the glossary and on the Scottish Government website. For this publication, areas in Scotland were divided into five equal groups (quintiles) with decreasing levels of deprivation.

Age and sex adjusted mortality rates for CHD are presented here, along with adjusted discharge rates for revascularisation.

**Coronary Heart Disease Mortality by Deprivation Quintiles**

There was a reduction in mortality in all the deprivation quintiles over the decade 2006-2015. The reduction in the age and sex adjusted CHD mortality rate among the most deprived quintile (quintile 1) was 31.3% compared with 38.5% in the least deprived quintile (quintile 5) - see Table DC7 and Figure 19. This implies a slight widening of relative inequalities.

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**Figure 19: Coronary Heart Disease Deaths by Deprivation (SIMD) Quintile**

Age and sex adjusted mortality rates per 100,000 population

Notes:
1. Analysis includes ICD-10 codes I20-I25
2. Uses 2012 version of SIMD
3. Rates are directly standardised to the 2013 European standard population.

Data Source: National Records Scotland - Deaths and Population
However, the absolute difference in the age and sex standardised mortality rate between the most deprived (quintile 1) and least deprived (quintile 5) quintiles decreased over the last decade from 126 to 100 per 100,000 population.

**Coronary Heart Disease Mortality by Deprivation Deciles**

For this section, areas in Scotland were divided into 10 equal groups (deciles) where decile 1 is most deprived and decile 10 is least deprived. The information is presented using age standardised mortality ratios (SMRs). SMRs are the ratio of actual deaths to expected deaths (calculated using the average Scottish mortality rate). It adjusts for the age and sex of the population being examined. If the actual mortality rate was the same as the expected mortality rate, the SMR would have a value of 100.

Figure 20 shows that the association between mortality and deprivation was stronger in the under 65 age category than in the over 65 category. In the under 65s there was a clear pattern between SMR and deprivation decile. The SMR in the under-65 age group was more than twice that of the Scottish average in the most deprived 10% of the population, whereas the SMR in the under-65 age group in the least deprived 10% of the population was more than 60% below the Scottish average (see Table DC1 and Figure 20).

**Figure 20: Coronary Heart Disease Standardised Mortality Ratios**

by broad age grouping and SIMD decile; 2011-2015

Notes: 1. Scotland is used as the ‘standard population’.

Data Source: National Records Scotland (NRS) deaths data 2011-2015
**Revascularisation by Deprivation Quintiles**

Over the last ten years, there was an increase in the age and sex adjusted discharge rate for revascularisation in all deprivation quintiles, with the exception of the least deprived quintile, in which the rate has decreased slightly by 0.8%. The rate in the most deprived quintile increased by 8.7% over the same period.

The absolute difference in the rate between the most deprived and least deprived quintiles increased from 41 to 60 per 100,000 population (Table DC3 and figure 21).

![Figure 21: Revascularisation by Deprivation (SIMD) Quintile](image)

**Notes:**
1. Analysis includes OPCS codes K40-K46 (main A position only); K49, K50, K75 (any A position)
2. Uses 2012 version of SIMD
3. Rates are directly standardised to the 2013 European standard population

**Data Source:** ISD SMR01 - discharges; National Records Scotland – Population

**p = Provisional**
Coronary Heart Disease Hospital Activity by Deprivation Quintiles

There was a reduction in the age and sex adjusted discharge rate for CHD for all deprivation quintiles over the last ten years. The rate in the most deprived quintile decreased by 1.0% compared to 14.6% in the least deprived quintile.

The absolute difference in the rate between the most deprived and least deprived quintiles increased from 531 to 643 per 100,000 population (Table DC4 and figure 22).

Figure 22: Coronary Heart Disease Hospital Activity\(^1\) by Deprivation (SIMD) Quintile\(^2\)
Age and sex adjusted discharge rates per 100,000 population\(^3\)

Notes: 1. Analysis includes ICD10 codes I20-I25
2. Uses 2012 version of SIMD
3. Rates are directly standardised to the 2013 European standard population
Data Source: ISD SMR01 - discharges; National Records Scotland – Population
p = Provisional

The Deprivation topic area of the Heart Disease web pages provides links to detailed data tables relating to deprivation.
Cardiovascular Prescribing

Cardiovascular disease covers a range of conditions including heart disease, strokes and diseases of the arteries and veins. This section describes statistics on drugs prescribed for the treatment of cardiovascular disease.

Of the prescriptions dispensed in the community, GPs write the vast majority. The remainder are written by nurses, dentists or are written in hospital to be dispensed in the community. Information on those NHS prescriptions is compiled by ISD's Prescribing Team from data provided by Practitioner Services Division (PSD) of NHS National Services Scotland. PSD is responsible for the processing and pricing of all prescriptions dispensed in the community in Scotland. Note that these data exclude drugs dispensed within hospitals.

The overall cost of cardiovascular drugs reduced over the last ten years, whilst the number of prescriptions gradually increased up to 2009/10 before levelling off. The changing price of statin drugs (used to prevent heart disease) partly explains this. Simvastatin, pravastatin and atorvastatin, three of the most widely used drugs, have come out of patent during this time, allowing equivalent lower cost non-branded (generic) drugs to be made available. Since then, the prices of these drugs have continued to decline, resulting in reduced overall costs, despite growth in the total volume prescribed. The increase in cost from 2014/15 is mainly due to the increased use of direct oral anti-coagulant drugs (DOACs).

In addition, lower prices have now been set for the non-branded drugs, resulting in further reduction in costs. The introduction of targets for quality improvement in General Practice, as part of the Quality and Outcomes Framework (QOF), is likely to have added to the growth in prescribing volume of statins by providing incentives to identify and treat those at high risk of cardiovascular disease.

The data presented here are identical to those in the prescribing section of the Stroke Statistics publication. This is because many drugs can be used for the treatment of both stroke and heart disease and it is not possible from available data to distinguish whether a drug was used to treat stroke or heart disease.

Prescriptions Dispensed

Over the decade 2006/07 - 2015/16, the numbers of prescriptions dispensed for cardiovascular related drugs rose from 23.1 million items to 24.6 million items prescribed, an increase of 6.6%. However since 2009/10 the numbers have remained fairly constant (Table G1 and figure 23).
GrossIngredientCosts

Gross ingredient cost indicates the total cost of a prescription drug. The overall cost of prescriptions dispensed for cardiovascular-related drugs increased from 2014/15, following a reduction over the rest of the last ten years. As mentioned before, this increase in cost is mainly due to the increased use of direct oral anti-coagulant drugs (DOACs). Over the last ten years, the gross ingredient cost has reduced by 44.6%.

Cardiovascular related drugs form approximately 10.6% of the total gross ingredient cost in Scotland (see Prescription Cost Analysis 2015/16).

The GP Prescribing topic area of the Heart Disease web pages provides links to detailed tables relating to cardiovascular prescribing.
Primary Care Activity

At present, there is one main source of data relating to primary care activity for heart disease. This is an estimate of the prevalence of heart-related conditions taken from Quality & Outcomes Framework (QOF) data recorded by practices in the form of disease registers.

The QOF measures a general practice’s achievement against a set of evidence-based indicators designed to promote good practice. Payments are made to each general practice on the basis of their level of achievement against those indicators. One of the features of QOF is the collection of prevalence data in the form of practice “registers”. A QOF register may count patients with one specific disease or condition, or it may include multiple conditions. There may also be other criteria for inclusion on a QOF register, such as age or date of diagnosis. More details are available on the ISD website.

Prevalence data is recorded as part of QOF for CHD, heart failure and atrial fibrillation. The prevalence estimates are available for Scotland, NHS Board, CHP and practice. Table 1 shows the number of patients on each register for Scotland and the raw prevalence rate per 100 patients in 2015/16. There were 230,949 patients on the CHD QOF register in 2015/16 (4.1% of the patients registered with a practice in Scotland). There were smaller numbers of patients on the atrial fibrillation and heart failure QOF registers (96,367 and 47,806 patients respectively). A more detailed table can be found on the ISD website.

Table 1. Estimated Scottish prevalence of heart-related conditions reported from QOF registers¹; 2015/16.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Patients on QOF register</th>
<th>Raw prevalence rate (per 100 patients)²³</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD</td>
<td>230,949</td>
<td>4.1</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>96,367</td>
<td>1.7</td>
</tr>
<tr>
<td>Heart failure</td>
<td>47,806</td>
<td>0.8</td>
</tr>
</tbody>
</table>

¹ Although the QOF is part of the new General Medical Services (GMS), practices with other contract types (17C or 2C) may also choose to use the QOF. These figures include data from practices of any contract type, and are therefore based on larger numbers of practices than tables based on GMS practices alone.
² Prevalence = number of patients on the specified QOF register, divided by list size, multiplied by 100.
³ List size is the total number of patients registered to the practice. This information is as at 1st January in the given financial year.

A further table in the QOF webpages of the ISD website provides trends in the raw prevalence rates.

The prevalence of CHD fell slightly over the last ten years from 4.5% in 2006/07 to 4.1% in 2015/16. The prevalence of atrial fibrillation rose slightly from 1.3% in 2006/07 to 1.7% in 2015/16. The prevalence of heart failure remained relatively unchanged over this period - 0.9% in 2006/07 compared to 0.8% in 2015/16.

In future, it is anticipated that further detailed information on heart disease will be available from the Scottish Primary Care Information Resource (SPIRE). This will supersede the Practice Team Information programme which collected data up to 2012/13. SPIRE is presently in development and will build on the data collected for PTI by including richer data from a greater number of practices and will help to inform public health surveillance, research and data linkage.
Ambulance Service Activity

Information on Scottish Ambulance Service (SAS) activity is collected for (a) incidents where a SAS resource attended and (b) conveyances where a patient was conveyed to hospital. More details are included in the glossary and in the definitions for tables SC1 and SC2. The SAS activity data gives an indication of demand on unscheduled care services (also including NHS24 and A&E) for people with suspected heart disease problems.

SAS records two main groupings of conditions which could indicate heart disease – heart problems and chest pain. The data presented in tables SC1 and SC2 are for the last seven years and by health board of the location of the incident.

**SAS Diagnosis - Heart Problems**

The full list of conditions included in the heart problems diagnosis group is given in Table SC1. They include cardiac history, abnormal breathing, chest pains, severe respiratory distress, firing of an automatic implantable cardioverter defibrillator (or AICD, a device that monitors a person’s heart rate) and abnormal heart rate. Note that the final diagnosis codes used here are not compatible with ICD10 diagnosis codes used elsewhere in this publication.

In the last seven years, the number of incidents increased by 85.3% from 3,273 to 6,065. The percentage increase in the number of conveyances was smaller – 72.5% from 3,024 to 5,217 (Table SC1 and Figure 24).

**Figure 24: Scottish Ambulance Service Activity**

Number of incidents and conveyances with a heart problem diagnosis

![Graph showing increase in number of incidents and conveyances with heart problem diagnosis from 2009/10 to 2015/16](image)

Data Source: SAS Data Warehouse
SAS Diagnosis - Chest Pains

The full list of conditions included in the chest pain diagnosis group is given in Table SC2. They include cardiac history, abnormal breathing, changing colour, nausea/vomiting, difficulty speaking between breaths and history of heart attack/angina. Note that the final diagnosis codes used here are not compatible with ICD10 diagnosis codes used elsewhere in this publication.

In the last seven years, the numbers of incidents and conveyances increased from 2009/10 to 2012/13 but then decreased slightly in the last three years. The overall percentage increase in the number of incidents was 26.2% from 34,313 in 2009/10 to 43,309 in 2015/16. The percentage increase in the number of conveyances for the same period was smaller – 20.9% from 31,237 to 37,771 (Table SC2 and Figure 25).

Figure 25: Scottish Ambulance Service Activity

Number of incidents and conveyances with a chest pain diagnosis

Data Source: SAS Data Warehouse

The increase in numbers reflects the increased overall demand experienced by the Scottish Ambulance Service. However, it should be noted that better recording of the diagnosis over time may also be responsible for some of the increase.
### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS</td>
<td>Acute Coronary Syndrome - an inclusive term referring to AMI (see below) and unstable angina.</td>
</tr>
<tr>
<td>Acute Hospital</td>
<td>Acute Hospital Care/Activity includes services such as: consultation with specialist clinicians; emergency treatment; routine, complex and life saving surgery; specialist diagnostic procedures; close observation and short-term care of patients. 'Acute' hospital care includes activity occurring in major teaching hospitals, district general hospitals and community hospitals but excludes obstetric and psychiatric services.</td>
</tr>
<tr>
<td>AICD</td>
<td>Automatic implantable cardioverter defibrillator, a device that monitors a person’s heart rate. It is generally implanted into heart failure patients to speed or slow down their heart rate.</td>
</tr>
<tr>
<td>AMI (also referred to as Heart Attack)</td>
<td>Acute myocardial infarction (heart attack): the result of sudden complete blockage of the blood supply to part of the heart.</td>
</tr>
<tr>
<td>Angina pectoris</td>
<td>Chest pain on exertion as a result of coronary heart disease.</td>
</tr>
<tr>
<td>Angiography</td>
<td>A procedure in which under X-ray guidance a long, thin tube is threaded into the coronary arteries via a blood vessel in the groin or arm. A dye, which can be seen on the X-ray screen, is injected, showing the pattern of the coronary arteries, and demonstrating where the artery is narrowed.</td>
</tr>
<tr>
<td>Angioplasty</td>
<td>A procedure performed to treat coronary heart disease that involves passing a thin, hollow tube into the coronary arteries under X-ray guidance, from an artery in the groin or arm (under local anaesthetic). A device on the tube is then used to unblock the artery, and stretch the artery walls so that more blood and oxygen can flow to the heart muscle. The full name of the procedure is percutaneous transluminal coronary angioplasty (PTCA).</td>
</tr>
<tr>
<td>Atrial Fibrillation</td>
<td>A heart condition where the upper chambers of the heart (atria) contract randomly, causing an irregular and abnormally fast heart rate.</td>
</tr>
<tr>
<td>CABG</td>
<td>Coronary artery bypass graft. An operation in which a blood vessel from another part of the body is grafted to the coronary artery or arteries, to bypass narrowed sections and restore blood flow to the heart muscle.</td>
</tr>
</tbody>
</table>
Cardiovascular disease (CVD)  
Cardiovascular disease describes disease of the heart or blood vessels, including strokes and other related conditions.

CHD (also referred to as Ischaemic Heart Disease)  
Coronary heart disease. Disease of the coronary arteries that supply the heart. This includes acute myocardial infarction, angina and most cases of heart failure.

Conveyance  
A SAS resource has recorded an at hospital time, indicating the patient was conveyed to hospital.

Datazone  
A small geographical area with a population between 500-1,000 household residents. They are based on groups of 2001 Census output areas.

Day case  
This is when a patient makes a planned attendance to a specialty for clinical care, and requires the use of a bed or trolley in lieu of a bed.

Discharge  
Discharges include transfers to other specialties/significant facilities and hospitals as well as routine discharges home or deaths in hospital. A patient could have more than one discharge in a year.

Emergency  
An emergency admission occurs when, for clinical reasons, a patient is admitted at the earliest possible time after seeing a doctor.

ePRF  
Electronic patient record form used by ambulance crews to record important patient information, including diagnostic data and treatment provided. This information can be accessed electronically by hospital staff.

European age-standardised rate  
The rate that would have been found if the population in Scotland had the same age-composition as the hypothetical standard European population. The 2013 European Standard Population (ESP2013) has been used to calculate EASRs within this publication. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Reports published before 2015 used ESP1976 to calculate EASRs. Figures using ESP1976 and ESP2013 are not comparable.

Final diagnostic code (SAS)  
Diagnosis codes recorded by SAS resource after treating the patient.

Generic drugs  
When the patent expires on a branded drug, the manufacturer loses exclusive rights to produce it. Generic drugs are non-branded.
versions produced by different manufacturers that produce equivalent clinical effects. Normally, the differences in formulation, and the small variation in the amount of drugs absorbed, make no difference clinically. Generic drugs are generally cheaper than their branded equivalents.

**Gross Ingredient Cost (GIC)**

Cost of drugs and appliances reimbursed before deduction of any dispenser discount (note: this definition differs from other parts of the UK).

**Heart attack**

The result of sudden complete blockage of the blood supply to part of the heart. Also known as acute myocardial infarction (AMI).

**Heart failure**

Failure of the heart as a pump, the commonest cause being coronary heart disease.

**Heart problems/AICD**

A final diagnostic code group used by SAS. This includes abnormal breathing, cardiac history, changing colour, chest pain, clammy, cocaine taken, difficulty speaking between breaths, firing of AICD, low/high heart rate, just resuscitated or defibrillated, not alert, severe respiratory distress.

**Ischaemic Heart Disease (IHD) – also referred to as CHD**

Disease that involves inadequate blood supply to the heart and in practice is synonymous with coronary heart disease.

**Incidence**

Incidence refers to the number of new cases of a condition in a defined population during a defined period and is typically expressed as the number of new cases per 100,000 population per year (or other suitable units). In this publication, an incident case is defined as the first admission to hospital (or death without a hospital admission). A first admission is defined as an admission where there has been no admission for the same condition in the previous 10 years. For example, a patient might be admitted with coronary heart disease in 2004 and again in 2005 for the same diagnosis. For the purpose of counting incidence, only the hospital admission in 2004 would be counted. The 2005 admission would not be counted because the previous admission occurred less than 10 years previously. First hospital admission is a reasonable measure of incidence for AMI and most forms of acute CHD since most cases are treated in hospital.

**Incident**

An incident where a SAS resource attends and record an at scene time.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient</td>
<td>This is when a patient occupies an available staffed bed in a hospital and either remains overnight whatever the original intention or is expected to remain overnight but is discharged earlier.</td>
</tr>
<tr>
<td>Items prescribed</td>
<td>Prescription items are prescribed and dispensed in the community. GPs write the vast majority of these prescriptions, with the remainder written mainly by nurses and dentists. The totals for items prescribed include prescriptions written in hospitals and dispensed in the community, but exclude drugs dispensed within hospitals themselves.</td>
</tr>
<tr>
<td>Mainland Health Boards</td>
<td>Health Boards in Scotland excluding the three Island Health Boards (Orkney, Shetland and Western Isles)</td>
</tr>
<tr>
<td>Mortality rate</td>
<td>The number of deaths as a rate per 100,000 population per year.</td>
</tr>
<tr>
<td>Outpatient</td>
<td>A patient who attends (outpatient attendance) a consultant or other medical clinic or has an arranged meeting with a consultant or a senior member of their team out with a clinic session.</td>
</tr>
<tr>
<td>Prevalence rate</td>
<td>The proportion of people with a given condition over a period of time (e.g. a year).</td>
</tr>
<tr>
<td>PTCA</td>
<td>Percutaneous Transluminal Coronary Angioplasty. The full name for an angioplasty. A procedure performed to treat coronary heart disease that involves passing a thin, hollow tube into the coronary arteries under X-ray guidance, from an artery in the groin or arm (under local anaesthetic). A device on the tube is then used to unblock the artery, and stretch the artery walls so that more blood and oxygen can flow to the heart muscle.</td>
</tr>
<tr>
<td>PTI</td>
<td>Practice Team Information (PTI) collects information from a 6% sample of Scottish general practices (60 practices in 2012/13). The population in the sample is a reasonable reflection of the Scottish population with regard to age, gender and deprivation. The information collected is on face-to-face consultations between patients and a GP or practice nurse. 2012/13 was the last year PTI data was collected since it is being superseded by SPIRE (see below).</td>
</tr>
<tr>
<td>QOF</td>
<td>The Quality &amp; Outcomes Framework (QOF) represents one of the main sources of potential income for general practices (GP surgeries) across the UK. It is a major part of the new General Medical Services (GMS) contract, introduced on 1st April 2004.</td>
</tr>
</tbody>
</table>
Participation by general practices in the QOF is voluntary. For those that do participate, the QOF measures achievement against a range of evidence-based indicators, with points and payments awarded according to the level of achievement.

Quintiles  Deprivation quintiles each contain 20% of the total population in Scotland. Deprivation quintile 1 contains the 20% of the population living in the most deprived datazones, while quintile 5 contains the 20% of the population living in the least deprived datazones.

Revascularisation  An inclusive term referring to CABG and angioplasty procedures.

SAS  The Scottish Ambulance Service.

SIMD  Deprivation for individuals is estimated from aggregate data derived from the census and other routine sources. These are used to estimate the deprivation of small geographical areas. The Scottish Index of Multiple Deprivation (SIMD) has seven domains (income, employment, education, housing, health, crime, and geographical access) at datazone level, which have been combined into an overall index to pick out area concentrations of multiple deprivation. See notes in tables as to which version of SIMD is used.

SMR01  An SMR01 is generated when a patient is discharged from hospital but also when a patient is transferred between hospitals, significant facilities, specialties or to the care of a different consultant.

SPIRE  Scottish Primary Care Information Resource (SPIRE) is a national GP information service being developed. It is open to all consenting GP practices in Scotland and will create a potential source of data for analysis.

Standardisation  See European age standardised rates.

30 day survival  Percentage of people who survive 30 days following a first emergency admission to hospital for a specific condition.

Unstable angina  Unstable angina is a form of acute coronary syndrome (ACS).
## List of Tables

<table>
<thead>
<tr>
<th>Table No.</th>
<th>Name</th>
<th>Time period</th>
<th>File &amp; size</th>
</tr>
</thead>
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<tr>
<td>AC1</td>
<td>Heart disease discharges by diagnosis, health board, admission type, age group and sex</td>
<td>2006/07-2015/16</td>
<td>Excel [3,067kb]</td>
</tr>
<tr>
<td>AC4</td>
<td>Heart disease discharges by diagnosis, council area, admission type, age group and sex</td>
<td>2006/07-2015/16</td>
<td>Excel [11,002kb]</td>
</tr>
<tr>
<td>IC1</td>
<td>Coronary heart disease incidence by health board, age group and sex</td>
<td>2006/07-2015/16</td>
<td>Excel [156kb]</td>
</tr>
<tr>
<td>IC2</td>
<td>Heart attack incidence by health board, age group and sex</td>
<td>2006/07-2015/16</td>
<td>Excel [156kb]</td>
</tr>
<tr>
<td>OC1</td>
<td>CHD operations by type, health board, admission type, age group and sex</td>
<td>2006/07-2015/16</td>
<td>Excel [2,621kb]</td>
</tr>
<tr>
<td>S1</td>
<td>30-day survival following first emergency admission for heart attack and unstable angina</td>
<td>2006/07-2015/16</td>
<td>Excel [64kb]</td>
</tr>
<tr>
<td>S3</td>
<td>30-day survival following first emergency admission for heart failure</td>
<td>2006/07-2015/16</td>
<td>Excel [55kb]</td>
</tr>
<tr>
<td>MC1</td>
<td>Heart disease mortality by cause, health board, age group and sex</td>
<td>2006-2015</td>
<td>Excel [1,544kb]</td>
</tr>
<tr>
<td>MC4</td>
<td>Heart disease mortality by cause, council area, age group and sex</td>
<td>2006-2015</td>
<td>Excel [1,109kb]</td>
</tr>
<tr>
<td>DC1</td>
<td>Coronary heart disease and deprivation; standardised mortality ratios (SMR) by age group and SIMD deciles</td>
<td>2011-2015 Combined</td>
<td>Excel [79kb]</td>
</tr>
<tr>
<td>DC3</td>
<td>Trends in revascularisation activity by SIMD quintile</td>
<td>2006/07-2015/16</td>
<td>Excel [37kb]</td>
</tr>
<tr>
<td>DC4</td>
<td>Trends in heart disease hospital activity by SIMD quintile</td>
<td>2006/07-2015/16</td>
<td>Excel [36kb]</td>
</tr>
<tr>
<td>DC7</td>
<td>Trends in coronary heart disease mortality by SIMD quintile</td>
<td>2006-2015</td>
<td>Excel [60kb]</td>
</tr>
<tr>
<td>G1</td>
<td>Cardiovascular prescribing - costs and number of prescriptions</td>
<td>2006/07-2015/16</td>
<td>Excel [78kb]</td>
</tr>
<tr>
<td>G2</td>
<td>Cardiovascular prescribing- costs, defined daily doses and numbers per 1000 population by drug group and health board</td>
<td>2015/16</td>
<td>Excel [146kb]</td>
</tr>
<tr>
<td>SC1</td>
<td>Heart problems – number of SAS incidents and conveyances by health board and sex</td>
<td>2009/10-2015/16</td>
<td>Excel [58kb]</td>
</tr>
<tr>
<td>SC2</td>
<td>Chest pains – number of SAS incidents and conveyances by health board and sex</td>
<td>2009/10-2015/16</td>
<td>Excel [60kb]</td>
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</tbody>
</table>
Contact

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Further Information

The Information Services Division publishes a range of heart disease-related information. You can find all our information on heart disease area of the website.

Corresponding information on stroke can be found on the stroke area of the ISD website.

The Scottish Public Health Observatory also provides further information on heart disease on their website.

Rate this publication

Please provide feedback on this publication to help us improve our services.
Appendix

A1 – Background Information

Clarification of Terminology

Different terms can be used when talking about heart disease conditions and operations and sometimes these are interchangeable. For consistency the following terms are used throughout this report.

<table>
<thead>
<tr>
<th>Term used in report</th>
<th>Also known as</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angioplasty</td>
<td>Percutaneous transluminal coronary angioplasty (PTCA)</td>
<td>A procedure performed to treat coronary heart disease that involves passing a thin, hollow tube into the coronary arteries under X-ray guidance, from an artery in the groin or arm (under local anaesthetic). A device on the tube is then used to unblock the artery, and stretch the artery walls so that more blood and oxygen can flow to the heart muscle.</td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td>Ischaemic heart disease</td>
<td>Disease of the coronary arteries that supply the heart. This includes acute myocardial infarction, angina and most cases of heart failure.</td>
</tr>
<tr>
<td>Heart attack</td>
<td>Acute myocardial infarction</td>
<td>The result of sudden complete blockage of the blood supply to part of the heart.</td>
</tr>
<tr>
<td>Heart failure</td>
<td>Cardiac failure</td>
<td>The failure of the heart to function properly as a pump.</td>
</tr>
</tbody>
</table>

Standardisation

Apparent differences in disease rates between areas or deprivation groups may be partially or entirely due to the fact that one population is different from the other in age structure. For example, areas with a larger proportion of younger people are unlikely to have as high levels of mortality as areas with larger proportions of older people. Therefore, if we don’t adjust for these differences, we may draw the wrong conclusion about the health of an area simply because of the age-structure of the population.

Information in this publication has been 'standardised' using the 2013 European standard population to calculate the European Age Standardised Rates (EASRs). EASRs make allowances for differences in the age and sex structure of the population between areas or time periods and allow fairer comparisons to be made.
Risk factors associated with CHD

The main preventable risk factors for CHD are smoking, high blood pressure, low levels of physical activity and a poor diet. There is also a strong relationship between social deprivation and these risk factors.

Detailed information on the prevalence of these risk factors is available from the Scottish Health Survey. The results of the Scottish Health survey can be found on the Scottish Government website.

Policy Context

NHS Scotland service provision for patients with CHD operates within the framework of Scottish Government policy. A chronology of policy documents that steer service provision for CHD and stroke patients is outlined below.

Coronary heart disease & stroke task force (2001)

Coronary heart disease & stroke strategy for Scotland (2002)


Delivering for Health (2005) (Scottish Government response to the "Kerr" report "Building a health service fit for the future")

Better health, better care - action plan. (2007)


Better heart disease & stroke care action plan (2009)

Heart disease improvement plan (2014)

Data Collection

Hospital Activity data

Hospital activity data are collected across NHS Scotland and are based on nationally available information routinely drawn from hospital administrative systems across the country. Hospital activity data includes inpatient and day case activity occurring in major teaching hospitals, district general hospitals and community hospitals but excludes obstetric and psychiatric services. This data collection is known as SMR01.

Tests for Heart Attacks (AMI)

The introduction of more sensitive tests such as troponin for the diagnosis of CHD - and the incorporation of troponin (and other biomarker) levels in definitions of heart attacks, has affected the diagnosis of heart attack over recent years. Since it is likely that cases previously undiagnosed would now be correctly determined as heart attack, variations in the definition, recording and coding of heart attack may affect inter-Health Board comparisons of heart attack incidence, and post-heart attack survival. ISD issued coding guidance in June 2007 covering
the recording of troponin levels in acute coronary syndromes - see Coding Guidelines Number 20.

Troponin

Troponin is a protein that is produced by the body when heart muscle is damaged. During a heart attack, the levels of certain types of troponin increase in the bloodstream. Troponin levels in the blood can therefore be used to determine whether a heart attack has taken place. Prior to the introduction of troponin testing, less severe heart attacks may have been diagnosed as unstable angina.

Prescribing data

Practitioner Services (PSD), a division of NHS National Services Scotland, processes all NHS prescriptions for payment of pharmacists, dispensing doctors and appliance suppliers. Hospital dispensed prescriptions are NOT included in the figures.

Information on NHS prescriptions dispensed in the community in Scotland is compiled by ISD’s Prescribing Team from data provided by Practitioner Services Division (PSD). PSD are responsible for the processing and pricing of all prescriptions dispensed in Scotland.

Deaths data

Information on the quality of National Records of Data on Deaths can be found on the National Records of Scotland website.

Data Completeness

The hospital activity figures in this publication are sourced from SMR01 records and the levels of completeness of the SMR01 data are deemed to be fit for publication (98% of the expected figure at the time of extraction).

Information on SMR01 data completeness can be found on the Hospital Records Data Monitoring SMR Completeness web page, while information on the timeliness of SMR01 data submissions can be found on the SMR Timeliness web page. Details on completeness can also be found within the excel data files.

Data Quality

The ISD Data Quality Assurance (DQA) team is responsible for evaluating and ensuring SMR datasets are accurate, consistent and comparable across time and between sources. Details of the quality assurance process for SMRs can be found are published on the DQA web page.

The DQA team’s previous projects web page contains details of past Data Quality Assurance Assessments, including final reports and findings.

The most recent report “Assessment of SMR01 Data 2010-2011” [350kb] was published in May 2012. This report includes feedback on clinical coding accuracy, sensitivity and completeness within defined groups and includes commonly encountered conditions including Ischaemic Heart Disease, Cerebrovascular Disease and Myocardial Infarction.

An earlier report, “Towards Better Data from Scottish Hospitals: An Assessment of SMR01 and Associated Data 2004-2006” [1.77Mb], contains sub-sections on specific conditions and interventions, including some related to CHD.
In hospital discharge data, clinical information for diagnoses and operations/interventions is currently recorded using ICD10 (the International Classification of Diseases 10th Revision maintained by the World Health Organization) and OPCS4 (the Office of Population Censuses & Surveys 4th Revision Classification of Surgical Operations and Procedures maintained by NHS Connecting for Health (CfH)).


For an extract of OPCS4 codes related to the heart see the file OPCS4 Classification of Surgical Operations and Procedures (Heart) [91kb] for details of the heart operations and procedures in its Chapter K. This document should be read in conjunction with the Information Standards Board document Summary of Changes from OPCS-4.6 to OPCS-4.7 for details of the latest updates to the coding classification.

Supporting information from ISD Scotland

Further information relating to heart disease and stroke is published by ISD Scotland:

1. ScotPHO – the Health and Well Being Profiles produce charts at NHS Board and Local Authority on premature mortality from CHD and CVD and patients hospitalised with CHD and CVD.

2. The Hospital Standardised Mortality Ratios updated quarterly produce information on deaths in hospitals participating in the Scottish Patient Safety Programme. Deaths will include those dying from heart disease and stroke.

3. Detailed tables on number/incidence of hospital episodes by diagnosis, including diseases of the circulatory system and number of procedures in main hospitals, including those associated with heart disease. This is available as part of the Hospital Care topic on the ISD website.

Independent and voluntary sector

Although there are a number of independent and voluntary sector organisations involved in the provision of information and services to CHD patients, two of the main ones, with links to NHSScotland, are the British Heart Foundation (BHF) and Chest, Heart & Stroke Scotland (CHSS). Both organisations are involved in the funding of research and provide extensive information for patients and carers on their respective web sites at http://www.bhf.org.uk/ and http://www.chss.org.uk/

Comparisons

**UK comparisons**

Hospital activity data relating to CHD in England, Wales and Northern Ireland are available separately. Please note that these figures are sometimes not directly comparable with published data from Scotland due to differences in recording and definitions. Prior to making comparisons, please check the definitions carefully for each of the sources.

England: NHS Hospital Episode Statistics (HES)

Wales: Health and care statistics
Mortality from specific causes, including heart disease, in England and Wales is available from the Office for National Statistics.

**International comparisons**

The Scotland and European Health for All database allows users to make comparisons of trends in CHD mortality in Scotland with countries in the rest of Europe. These include standardised death rates and hospital discharges for coronary heart disease and cerebrovascular disease. European comparisons indicate that while CHD mortality rates have fallen, Scotland still compares unfavourably with most other European countries.

**Further Information**

Our "Links to other sources" section offers a few examples of other information sources.
## Metadata Indicator Description

<table>
<thead>
<tr>
<th>Metadata Indicator</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Publication title</strong></td>
<td>Scottish Heart Disease Statistics</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>Annual update of heart disease statistics. Update including hospital activity, incidence, operations, 30 days survival, mortality, deprivation, prescribing, primary care and ambulance service activity.</td>
</tr>
<tr>
<td><strong>Theme</strong></td>
<td>Health and Social Care</td>
</tr>
<tr>
<td><strong>Topic</strong></td>
<td>Conditions and Diseases</td>
</tr>
<tr>
<td><strong>Format</strong></td>
<td>Excel workbooks</td>
</tr>
</tbody>
</table>
| **Data source(s)** | Scottish Morbidity Record 01 (SMR01)  
National Records of Scotland (NRS) Death Registrations and Population Estimates  
Prescribing Information System (PIS)  
Scottish Index of Multiple Deprivation (Scottish Government)  
SAS Data Warehouse  
Quality Outcomes Framework (QOF). |
| **Date that data are acquired** | November 2016 |
| **Release date** | 21 February 2017 |
| **Frequency** | Annual |
| **Timeframe of data and timeliness** | 10 years annual data up to 31-Mar-2016 (hospital activity, operations, prescribing, incidence, survival), 31-Dec-2015 (mortality). 7 years annual data up to 31-Mar-2016 (ambulance service). |
| **Continuity of data** | Mortality data: Reports data since 2005. There was a change to the coding of causes of death by National Records of Scotland between 2010 and 2011. The overall scale of change was small. For full details, please consult the [NRS website](#).  
Population estimates: Small corrections were made to the 2012-2014 mid-year population estimates by NRS. The errors had no effect on the population for Scotland and a very small effect on health board and council area populations. For full details, please consult the [NRS website](#).  
Prescribing data: The definition of the main measures such as gross ingredient cost and number of items are unchanged over this period. Types and value of dispensing fees are agreed the Scottish Government and set annually. Details can be found in the [Scottish Drug Tariff](#) and in... |
Primary Care circulars issued by the Government. Drug products are first licensed as proprietary medicines but generic versions often appear once the original patent expires. This can affect the price and uptake of these drugs. The Scottish Government sets the reimbursement price of generic drug products via the Scottish Drug Tariff which is updated and issued quarterly.

Hospital admissions: The introduction of more sensitive tests for the diagnosis of acute coronary ischaemia - e.g. troponin - and the incorporation of troponin (and other biomarker) levels in definitions of acute myocardial infarction (AMI), may have affected the recording of AMI over recent years. Variations in the definition, recording and coding of AMI may affect inter-hospital and inter-Health Board comparisons of AMI incidence, prevalence and post-AMI survival. ISD issued coding guidance in June 2007 covering the recording of troponin levels in acute coronary syndromes - see Coding Guidelines Number 20.

<table>
<thead>
<tr>
<th>Revisions statement</th>
<th>This publication contains planned revisions. More details below.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revisions relevant to this publication</td>
<td>Historical mortality figures at health board level have been updated. The changes are minor and relate to a small number of death registrations that had not previously been assigned to a health board. Figures at Scotland and council area level are unaffected.</td>
</tr>
<tr>
<td>Concepts and definitions</td>
<td>See Glossary and Appendix A1 contained within this report.</td>
</tr>
<tr>
<td>Relevance and key uses of the statistics</td>
<td>Uses of the data include:</td>
</tr>
<tr>
<td></td>
<td>To allow NHS Boards and the Scottish Government to compare activity levels nationally;</td>
</tr>
<tr>
<td></td>
<td>To provide health intelligence and performance information for NHS Boards and the Scottish Government;</td>
</tr>
<tr>
<td></td>
<td>To provide information to support answers to Parliamentary Questions;</td>
</tr>
<tr>
<td></td>
<td>To support the information requirements of voluntary sector organisations such as British Heart Foundation (BHF), including research and media activity;</td>
</tr>
<tr>
<td></td>
<td>To allow members of the public to readily access information on heart disease;</td>
</tr>
<tr>
<td></td>
<td>To respond to information requests for a variety of customers e.g. researchers, charities, public companies, Freedom of Information requests;</td>
</tr>
<tr>
<td></td>
<td>To assist students and universities conducting studies on topics such as heart disease;</td>
</tr>
<tr>
<td></td>
<td>To assist private companies interested in heart disease information in Scotland, such as pharmaceutical companies and consultancy companies.</td>
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</tbody>
</table>
| Accuracy       | Mortality: For coding of deaths see the website of the [National Records of Scotland](https://www.nrscotland.gov.uk). Reported data are compared to previous years’ figures and to expected trends.

Prescribing: The data is sourced from a payment system and routine monthly checks are carried out by PSD on a random sample of approximately 5% of prescription payments. These check all data captured for payment and the accuracy of the payment calculation and have a target accuracy of 98% which is routinely met. Data that is captured but is not mandatory for payment purposes can be of lower quality; principally this includes the prescriber code which links a prescription back to the individual prescriber e.g. GP and their organisation including NHS Board. Routine monitoring of unallocated prescriptions is carried out and correct codes are applied before publication. This ensures that unallocated prescriptions account for under 2% of all prescriptions. For remaining unallocated prescriptions, the prescribing NHS Board is assumed to be the same as the dispensing NHS Board.

Hospital Activity: SMR01 data are subjected to validation on submission. The figures are compared to previous years’ figures and to expected trends. The SMR01 data are also assessed for accuracy by ISD’s Data Quality Assurance team – see Appendix A1.

| Completeness   | Mortality: Death registrations are deemed to be complete and finalised.

Prescribing: The Prescribing Information System holds information on 100% of NHS Scotland prescriptions dispensed within the community and claimed for payment by a pharmacy contractor (i.e. pharmacy, dispensing doctor or appliance supplier). It does not include data on prescriptions dispensed but not claimed (likely to be very small) or prescriptions prescribed but not submitted for dispensing by a patient. Some research has estimated these latter prescriptions to account for around 6% of all prescriptions issued to patients. It is not possible to determine from payment data how much of the medicine dispensed to patients is actually taken in accordance with dosage instructions.

Hospital Activity: Levels of SMR01 submission are deemed to be 98% complete compared to expected levels of submission at time of extraction.

| Comparability  | Prescribing: The main measures of drug ingredient cost and volumes of items dispensed in the community are comparable across the UK countries. However it should be noted that the Gross Ingredient Cost (GIC) within Scotland is equivalent to the Net Ingredient Cost (NIC) in England,
i.e. the reimbursement cost of drugs before any pharmacy discounts are applied. Also each country determines its own dispensing fees based on separate contractual arrangements with dispensing contractors in each country. A common formulary called the British National Formulary (BNF) is used to classify drugs based on therapeutic use.

Hospital activity data relating to coronary heart disease in England, Wales and Northern Ireland are available separately. Please note that these figures are sometimes not directly comparable with published data from Scotland due to differences in recording and definitions. Prior to making comparisons, please check the definitions carefully for each of the sources.

England: NHS Hospital Episode Statistics (HES)
Wales: Health and care statistics
Northern Ireland: Hospital Statistics & Research

Mortality: Deaths from specific causes, including heart disease, in England and Wales is available from the Office for National Statistics.

<table>
<thead>
<tr>
<th>Accessibility</th>
<th>It is the policy of ISD Scotland to make its web sites and products accessible according to published guidelines.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coherence and clarity</td>
<td>Relevant key statistics are presented on each Topic Area page. Statistics are presented within Excel spreadsheets. Geographical areas and national figures are presented using drop down menus. Further features to aid clarity: 1. Tables use drop down menus to display data by Age Band, Diagnostic and other Groupings. 2. Key data presented graphically. 3. Each Excel workbook contains a notes page.</td>
</tr>
</tbody>
</table>
| Value type and unit of measurement | The number of deaths in a given year is based on the date of registration. Rates are expressed as both a crude rate per 100,000 population and directly standardised for age only or both age and sex as detailed on the notes pages of the relevant Excel table. The main units of measure of drug reimbursement costs are Gross Ingredient Cost (GIC) and Net ingredient cost (NIC) quantity. The latter takes account of pharmacy discounts, the rates for which are set by the Scottish Government in the Scottish Drug Tariff. There are a large number of individual dispensing remuneration fees paid to dispensing contractors details of which can be found in the Scottish Drug Tariff. The main measures of drug volume are items (the number of individual drug items on a prescription form), quantity (the total number of tablets, capsules etc), and defined daily doses (DDDs - estimated
average daily maintenance doses for a total quantity of prescribed).

Hospital activity is based on hospital episodes, which if based on the date of discharge. Rates are expressed as both a crude rate per 100,000 population and directly standardised for age only or both age and sex as detailed on the notes page of the relevant Excel tables.

<table>
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<tr>
<th>Disclosure</th>
<th>The ISD protocol on Statistical Disclosure Protocol is followed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Official Statistics designation</td>
<td>National Statistics</td>
</tr>
<tr>
<td>UK Statistics Authority Assessment</td>
<td>April 2013</td>
</tr>
<tr>
<td>Last published</td>
<td>26 January 2016</td>
</tr>
<tr>
<td>Next published</td>
<td>30 January 2018</td>
</tr>
<tr>
<td>Date of first publication</td>
<td>22 February 2011 (in current format)</td>
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<tr>
<td>Help email</td>
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<td>Date form completed</td>
<td>08 February 2017</td>
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A3 – Early Access details (including Pre-Release Access)

Pre-Release Access
Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", ISD are obliged to publish information on those receiving Pre-Release Access ("Pre-Release Access" refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

Standard Pre-Release Access:
- Scottish Government Health Department
- NHS Board Chief Executives
- NHS Board Communication leads
A4 – ISD and Official Statistics

About ISD
Scotland has some of the best health service data in the world combining high quality, consistency, national coverage and the ability to link data to allow patient based analysis and follow up.

Information Services Division (ISD) is a business operating unit of NHS National Services Scotland and has been in existence for over 40 years. We are an essential support service to NHSScotland and the Scottish Government and others, responsive to the needs of NHSScotland as the delivery of health and social care evolves.

Purpose: To deliver effective national and specialist intelligence services to improve the health and wellbeing of people in Scotland.

Mission: Better Information, Better Decisions, Better Health

Vision: To be a valued partner in improving health and wellbeing in Scotland by providing a world class intelligence service.

Official Statistics
Information Services Division (ISD) is the principal and authoritative source of statistics on health and care services in Scotland. ISD is designated by legislation as a producer of ‘Official Statistics’. Our official statistics publications are produced to a high professional standard and comply with the Code of Practice for Official Statistics. The Code of Practice is produced and monitored by the UK Statistics Authority which is independent of Government. Under the Code of Practice, the format, content and timing of statistics publications are the responsibility of professional staff working within ISD.

ISD’s statistical publications are currently classified as one of the following:
- National Statistics (ie assessed by the UK Statistics Authority as complying with the Code of Practice)
- National Statistics (ie legacy, still to be assessed by the UK Statistics Authority)
- Official Statistics (ie still to be assessed by the UK Statistics Authority)
- other (not Official Statistics)

Further information on ISD’s statistics, including compliance with the Code of Practice for Official Statistics, and on the UK Statistics Authority, is available on the ISD website.

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics. Designation can be broadly interpreted to mean that the statistics:
- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.