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 2016, there were 6,697 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 6.7% of men and 4.2% of women are living with CHD (Scottish Health Survey 2016). 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 2016 - 31 March 2017, and mortality up to the period 1st January - 31st December 2016.

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 39.6% between 2007 and 2016. 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 26.7%. 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 (36.1%) over the last ten years was larger than that in the least deprived category (31.7%).

- 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 86.0% to 92.9%.

- The number of prescriptions for drugs to treat diseases of the circulation increased by 3.5% in the last ten years. Despite this, the cost of prescriptions dispensed for these drugs has fallen by 37.7% over the last ten years to £124.0 million in 2016/17, 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, but there has been a small increase in the latest year. Between 2007/08 and 2016/17, the age and sex adjusted discharge rate fell by 10.2% from 1,098 to 986 per 100,000 population. The actual number of discharges remained fairly steady at just over 50,000 discharges per year.

![Figure 1: Discharges from hospital with coronary heart disease; Age and sex adjusted discharge rates per 100,000 population](chart)

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 2016/17 and are subject to change in future analyses.

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

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

3 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 2016/17 and there was a larger percentage decrease for females over the last decade (11.3% for females compared to 9.7% for males).

The percentage decrease in the rate was larger in the under-75 age group (12.5%) than in the over-75 group (5.6%).

Comparing mainland NHS Boards, in 2016/17 the adjusted discharge rate was lowest in NHS Lothian (611 per 100,000 population) and highest in NHS Lanarkshire (1,438 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 351 per 100,000 population in 2007/08 to 523 per 100,000 population in 2016/17, an increase of 48.8%.

There was 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**

- **Age and sex adjusted discharge 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  
P. Data are provisional for 2016/17 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 320 per 100,000 population in 2007/08 compared to 126 in 2016/17, a decrease of 60.7% (Figure 3).

Figure 3: Discharges from hospital with a diagnosis of angina; Age and sex adjusted discharge rates per 100,000 population

Notes: 1. Analysis includes ICD-10 code I20.
2. Rates are directly standardised to the 2013 European standard population
P. Data are provisional for 2016/17 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 slightly smaller in the under 75 age group (60.2%) compared to the over 75 age group (61.5%) - 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 29.9%, from 266 per 100,000 population in 2007/08 to 346 in 2016/17. (Figure 4 and Table AC1).

![Figure 4: Discharges from hospital with a diagnosis of heart failure; Age and sex adjusted discharge rates per 100,000 population](image)

Notes: 1. Analysis includes ICD-10 codes I50.
2. Rates are directly standardised to the 2013 European standard population.
3. Data are provisional for 2016/17 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 772 per 100,000 population in 2007/08 to 626 in 2016/17, a decrease of 18.9% (Figure 5 and Table AC1).

The discharge rate decreased over the last decade by 12.7% for females and by 23.7% for males. There was a larger decrease in the under-75 age group (21.1%) than in the over-75 age group (11.0%).
Figure 5: Discharges from hospital with a diagnosis of chest pain; Age and sex adjusted discharge rates per 100,000 population

Notes:
1. Analysis includes ICD-10 codes R07.
2. Rates are directly standardised to the 2013 European standard population.
P. Data are provisional for 2016/17 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 26.7% from 481 per 100,000 population in 2007/08 to 353 in 2016/17 (Figure 6).

Figure 6: Coronary Heart Disease<sup>1</sup>

Age and sex adjusted incidence rates per 100,000 population<sup>2</sup>

The incidence of CHD increases sharply with age. The age and sex adjusted incidence rate for the under 75 age group in 2016/17 was 227 per 100,000 population but for the over-75 age group, it was 1,633 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 for females (29.8%) over the last ten years than for males (25.0%) (Table IC1).
Comparing mainland NHS Boards, in 2016/17 the adjusted incidence rate was lowest in NHS Lothian (288 per 100,000 population) and highest in NHS Ayrshire & Arran (419 per 100,000 population) (Table IC1).

**Heart Attacks**

The age and sex adjusted incidence rate for heart attacks decreased by 8.1% from 242 per 100,000 population in 2007/08 to 223 in 2016/17. 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**

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.
P. Data are provisional for 2016/17 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 55 per 100,000 population in 2007/08 to 27 per 100,000 population in 2016/17, a reduction of 51.0% (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  P. Data are provisional for 2016/17 and are subject to change in future analyses.

Data Source: ISD SMR01 - discharges; National Records Scotland – Population
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 128 per 100,000 population in 2007/08 to 163 in 2016/17, an increase of 27.1% (Table OC1 and figure 9).

Figure 9: Angioplasty¹
Age and sex adjusted discharge rates per 100,000 population²

Notes: 1. Analysis includes OPCS codes K49, K50, K75 (any A position)
2. Rates are directly standardised to the 2013 European standard population
   P data are provisional for 2016/17 and are subject to change in future analyses.
   Data Source: ISD SMR01 - discharges; National Records Scotland – Population

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 183 per 100,000 population in 2007/08 to 190 in 2016/17, an increase of 3.7% (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.
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 with a small increase for the latest year. The age and sex adjusted hospital discharge rate dropped from 282 per 100,000 population in 2007/08 to 201 in 2016/17, a reduction of 28.9% (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 94 per 100,000 population in 2007/08 to 137 in 2016/17, an increase of 45.5%. This reflects the increased use of angioplasties in the treatment of CHD (Table OC1 and figure 12).
Figure 11: Diagnostic angiography with no associated angioplasty
Age and sex adjusted discharge rates per 100,000 population

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
P. Data are provisional for 2016/17 and are subject to change in future analyses.
Data Source: ISD SMR01 - discharges; National Records Scotland – Population

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

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
P. Data are provisional for 2016/17 and are subject to change in future analyses.
Data Source: ISD SMR01 - discharges; National Records Scotland – Population
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 2007/08 to 2016/17 (Figure 13). The percentage who survived 30 days for both sexes combined increased from 86.0% in 2007/08 to 92.9% in 2016/17 (Table S1 and Figure 13). Over the same period, there was a narrowing of the gap in the survival between males and females from 5.9 to 3.2 percentage points.

For those aged 75 and over, 30 day survival increased from 73.1% in 2007/08 to 85.9% in 2016/17.

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

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.
P. Data are provisional for 2016/17 and are subject to change in future analyses.
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 84.5% to 87.0% during that time (Table S3 and figure 14). For those aged 75 and over, the percentage surviving 30 days increased from 81.3% to 84.3% 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 80% to enable clearer comparison between sexes.
P. Data are provisional for 2016/17 and are subject to change in future analyses.
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.

The overall trend in the last 10 years in Scotland shows a decrease in the rate of mortality, from 289 per 100,000 population in 2007 to 202 per 100,000 population in 2016, or a 30.1% decrease (Table MC1 and Figure 15). There was a small increase in the age and sex adjusted mortality rate from heart disease (including CHD) from 2014 to 2015 but decreased again in 2016. 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.

Figure 15: All heart disease\(^1\): all ages by sex
Age and sex adjusted mortality rates per 100,000 population\(^2\)

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 (29.1%) (Table MC1).

\(^4\) The figures included in the Mortality 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
The age and sex adjusted mortality rate for CHD fell from 226 per 100,000 population in 2007 to 136 in 2016, a reduction of 39.6% over the last 10 years (Table MC1 and figure 17).

Figure 17: Coronary heart disease\(^1\): all ages by sex
Age and sex adjusted mortality rates per 100,000 population\(^2\)

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 2007 and 2016 the reduction in age and sex adjusted mortality rates for CHD was similar for the two sexes, for females (39.6%) and for males (39.7%). The difference in rates between men and women narrowed from 150 deaths per 100,000 population in 2007 to 90 deaths per 100,000 population in 2016.

Of the mainland NHS Health Boards, NHS Ayrshire & Arran had the highest age and sex adjusted mortality rate in 2016 (156 per 100,000 population) while NHS Borders had the lowest rate (114 per 100,000 population). NHS Forth Valley had the highest percentage reduction in the mortality rate among the mainland Health Boards between 2007 and 2016 (48.3%), while NHS Dumfries & Galloway had the lowest percentage reduction in the mortality rate between 2007 and 2016 (31.0%).
Heart Attacks

The age and sex adjusted mortality rate for heart attacks decreased substantially over the last ten years, falling by 42.5% from 129 per 100,000 population in 2007 to 74 in 2016 (Table MC1 and figure 18).

Figure 18: Heart attacks¹: all ages by sex
Age and sex adjusted mortality rates per 100,000 population²

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 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 2007-2016. The reduction in the age and sex adjusted CHD mortality rate among the most deprived quintile (quintile 1) was 36.1% compared with 31.7% in the least deprived quintile (quintile 5) - see Table DC7 and Figure 19.

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 160 to 95 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\(^1\) by broad age grouping and SIMD decile; 2012-2016

Notes: 1. Scotland is used as the ‘standard population’.
Data Source: National Records Scotland (NRS) deaths data 2012-2016
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 2.4%. The rate in the most deprived quintile increased by 12.1% over the same period.

The absolute difference in the rate between the most deprived and least deprived quintiles increased from 52 to 82 per 100,000 population (Table DC3 and figure 21).

Figure 21: Revascularisation1 by Deprivation (SIMD) Quintile2
Age and sex adjusted discharge rates per 100,000 population3

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
P. Data are provisional for 2016/17 and are subject to change in future analyses.
Data Source: ISD SMR01 - discharges; National Records Scotland – Population
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, with the exception of the most deprived quintile, in which the rate has increased by 4.9%. The rate in the least deprived quintile decreased by 12.0%.

The absolute difference in the rate between the most deprived and least deprived quintiles increased from 574 to 741 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

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. The number of prescriptions has been relatively stable, although there has been an increase over the last few years. 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 2007/08 - 2016/17, the numbers of prescriptions dispensed for cardiovascular related drugs rose from 23.7 million items to 24.5 million items prescribed, an increase of 3.5%. However since 2009/10 the numbers have remained fairly constant (Table G1 and figure 23).
Gross Ingredient Costs

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 37.7%.

Cardiovascular related drugs form approximately 10.9% of the total gross ingredient cost in Scotland (see Prescription Cost Analysis 2016/17).

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

Previous publications included information from the Quality & Outcomes Framework (QOF) data. Up till 2015/16 this was the main source of data relating to primary care activity for heart disease. This was an estimate of the prevalence of heart-related conditions recorded by practices in the form of disease registers. ISD no longer publish this information as the QOF was decommissioned.

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 eight 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 eight years, the number of incidents more than doubled, increasing from 3,273 to 7,055. The percentage increase in the number of conveyances was smaller – 99.8% from 3,024 to 6,041 (Table SC1 and Figure 24).
**Figure 24: Scottish Ambulance Service Activity**

**Number of incidents and conveyances with a heart problem diagnosis**

Data Source: SAS Data Warehouse

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**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 eight 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 28.2% from 34,313 in 2009/10 to 43,975 in 2016/17. The percentage increase in the number of conveyances for the same period was smaller – 22.3% from 31,237 to 38,192 ([Table SC2](#) and Figure 25).
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.

Data Source: SAS Data Warehouse
## Glossary

**ACS**
Acute Coronary Syndrome - an inclusive term referring to AMI (see below) and unstable angina.

**Acute Hospital**
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.

**AICD**
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.

**AMI (also referred to as Heart Attack)**
Acute myocardial infarction (heart attack): the result of sudden complete blockage of the blood supply to part of the heart.

**Angina pectoris**
Chest pain on exertion as a result of coronary heart disease.

**Angiography**
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.

**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. The full name of the procedure is percutaneous transluminal coronary angioplasty (PTCA).
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<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>
<tr>
<td>Cardiovascular disease (CVD)</td>
<td>Cardiovascular disease describes disease of the heart or blood vessels, including strokes and other related conditions.</td>
</tr>
<tr>
<td>CHD (also referred to as Ischaemic Heart Disease)</td>
<td>Coronary heart disease. 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>Conveyance</td>
<td>A SAS resource has recorded an at hospital time, indicating the patient was conveyed to hospital.</td>
</tr>
<tr>
<td>Datazone</td>
<td>A small geographical area with a population between 500-1,000 household residents. They are based on groups of 2001 Census output areas.</td>
</tr>
<tr>
<td>Day case</td>
<td>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.</td>
</tr>
<tr>
<td>Discharge</td>
<td>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.</td>
</tr>
<tr>
<td>Emergency</td>
<td>An emergency admission occurs when, for clinical reasons, a patient is admitted at the earliest possible time after seeing a doctor.</td>
</tr>
<tr>
<td>ePRF</td>
<td>Electronic patient record form used by ambulance crews to record important patient information, including diagnostic data and</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>European age-standardised rate</td>
<td>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.</td>
</tr>
<tr>
<td>Final diagnostic code (SAS)</td>
<td>Diagnosis codes recorded by SAS resource after treating the patient.</td>
</tr>
<tr>
<td>Generic drugs</td>
<td>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.</td>
</tr>
<tr>
<td>Gross Ingredient Cost (GIC)</td>
<td>Cost of drugs and appliances reimbursed before deduction of any dispenser discount (note: this definition differs from other parts of the UK).</td>
</tr>
<tr>
<td>Heart attack</td>
<td>The result of sudden complete blockage of the blood supply to part of the heart. Also known as acute myocardial infarction (AMI).</td>
</tr>
<tr>
<td>Heart failure</td>
<td>Failure of the heart as a pump, the commonest cause being coronary heart disease.</td>
</tr>
<tr>
<td>Heart problems/AICD</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Ischaemic Heart Disease (IHD)</strong> – also referred to as CHD</td>
<td>Disease that involves inadequate blood supply to the heart and in practice is synonymous with coronary heart disease.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Incidence</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Incident</strong></td>
<td>An incident where a SAS resource attends and record an at scene time.</td>
</tr>
<tr>
<td><strong>Inpatient</strong></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><strong>Items prescribed</strong></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><strong>Mainland Health Boards</strong></td>
<td>Health Boards in Scotland excluding the three Island Health Boards (Orkney, Shetland and Western Isles)</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</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. 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.</td>
</tr>
</tbody>
</table>
| 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).
<table>
<thead>
<tr>
<th>Table No.</th>
<th>Name</th>
<th>Time period</th>
<th>File &amp; size</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC1</td>
<td>Heart disease discharges by diagnosis, health board, admission type, age group and sex</td>
<td>2007/08-2016/17</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>2007/08-2016/17</td>
<td>Excel [9,008kb]</td>
</tr>
<tr>
<td>IC1</td>
<td>Coronary heart disease incidence by health board, age group and sex</td>
<td>2007/08-2016/17</td>
<td>Excel [156kb]</td>
</tr>
<tr>
<td>IC2</td>
<td>Heart attack incidence by health board, age group and sex</td>
<td>2007/08-2016/17</td>
<td>Excel [156kb]</td>
</tr>
<tr>
<td>OC1</td>
<td>Numbers of Procedures by health board, age group and sex</td>
<td>2007/08-2016/17</td>
<td>Excel [5,555kb]</td>
</tr>
<tr>
<td>S1</td>
<td>30-day survival following first emergency admission for heart attack and unstable angina</td>
<td>2007/08-2016/17</td>
<td>Excel [64kb]</td>
</tr>
<tr>
<td>S3</td>
<td>30-day survival following first emergency admission for heart failure</td>
<td>2007/08-2016/17</td>
<td>Excel [55kb]</td>
</tr>
<tr>
<td>MC1</td>
<td>Heart disease mortality by cause, health board, age group and sex</td>
<td>2007-2016</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>2007-2016</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>2012-2016 Combined</td>
<td>Excel [79kb]</td>
</tr>
<tr>
<td>DC3</td>
<td>Trends in revascularisation activity by SIMD quintile</td>
<td>2007/08-2016/17</td>
<td>Excel [37kb]</td>
</tr>
<tr>
<td>DC4</td>
<td>Trends in heart disease hospital activity by SIMD quintile</td>
<td>2007/08-2016/17</td>
<td>Excel [36kb]</td>
</tr>
<tr>
<td>DC7</td>
<td>Trends in coronary heart disease mortality by SIMD quintile</td>
<td>2007-2016</td>
<td>Excel [60kb]</td>
</tr>
<tr>
<td>G1</td>
<td>Cardiovascular prescribing - costs and number of prescriptions</td>
<td>2007/08-2016/17</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>2016/17</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>2009/10-2016/17</td>
<td>Excel [58kb]</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------------------</td>
<td>------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>SC2</td>
<td>Chest pains – number of SAS incidents and conveyances by health board and sex</td>
<td>2009/10-2016/17</td>
<td>Excel [60kb]</td>
</tr>
</tbody>
</table>
Contact
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Further Information
Further Information can be found on the ISD website.
For more information on heart disease see the heart disease area of our website. For related information on stroke, please see the stroke pages.
The next release of this publication will be in January 2019.

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

Appendix 1 – 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 (99% 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)](http://www.who.int/classifications/icd/en/) [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](http://www.who.int/classifications/icd/en/) 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
Northern Ireland: Hospital Statistics & Research

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.
# Appendix 2 – Publication Metadata

<table>
<thead>
<tr>
<th>Metadata Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication title</td>
<td>Scottish Heart Disease Statistics</td>
</tr>
<tr>
<td>Description</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>Theme</td>
<td>Health and Social Care</td>
</tr>
<tr>
<td>Topic</td>
<td>Conditions and Diseases</td>
</tr>
<tr>
<td>Format</td>
<td>Excel workbooks</td>
</tr>
<tr>
<td>Data source(s)</td>
<td>Scottish Morbidity Record 01 (SMR01)</td>
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<td></td>
<td>National Records of Scotland (NRS) Death Registrations and Population Estimates</td>
</tr>
<tr>
<td></td>
<td>Prescribing Information System (PIS)</td>
</tr>
<tr>
<td></td>
<td>Scottish Index of Multiple Deprivation (Scottish Government)</td>
</tr>
<tr>
<td></td>
<td>SAS Data Warehouse</td>
</tr>
<tr>
<td></td>
<td>Quality Outcomes Framework (QOF).</td>
</tr>
<tr>
<td>Date that data are acquired</td>
<td>November 2017</td>
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<td>Release date</td>
<td>30 January 2018</td>
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<tr>
<td>Frequency</td>
<td>Annual</td>
</tr>
<tr>
<td>Timeframe of data and timeliness</td>
<td>10 years annual data up to 31-Mar-2017 (hospital activity, operations, prescribing, incidence, survival), 31-Dec-2016 (mortality). 8 years annual data up to 31-Mar-2017 (ambulance service).</td>
</tr>
<tr>
<td>Continuity of data</td>
<td>Mortality data: Reports data since 2007. 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 <a href="https://www.nrscotland.gov.uk/">NRS website</a>.</td>
</tr>
<tr>
<td></td>
<td>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 <a href="https://www.nrscotland.gov.uk/">NRS website</a>.</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
</tbody>
</table>
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**.

### Revisions statement
This publication contains planned revisions. More details below.

### Revisions relevant to this publication
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.

### Concepts and definitions
See **Glossary** and **Appendix A1** contained within this report.

### Relevance and key uses of the statistics
Uses of the data include:

- To allow NHS Boards and the Scottish Government to compare activity levels nationally;
- To provide health intelligence and performance information for NHS Boards and the Scottish Government;
- To provide information to support answers to Parliamentary Questions;
- To support the information requirements of voluntary sector organisations such as British Heart Foundation (BHF), including research and media activity;
- To allow members of the public to readily access information on heart disease;
- To respond to information requests for a variety of customers e.g. researchers, charities, public companies, Freedom of Information requests;
<table>
<thead>
<tr>
<th>Information Services Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>To assist students and universities conducting studies on topics such as heart disease;</td>
</tr>
<tr>
<td>To assist private companies interested in heart disease information in Scotland, such as pharmaceutical companies and consultancy companies.</td>
</tr>
</tbody>
</table>

### Accuracy

- **Mortality:** For coding of deaths see the website of the [National Records of Scotland](#). 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](https://www.ons.gov.uk).

### Accessibility

It is the policy of ISD Scotland to make its web sites and products accessible according to [published guidelines](https://www.isdscotland.org).

### Coherence and clarity

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 section.
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.

Disclosure

The ISD protocol on Statistical Disclosure Protocol is followed.

Official Statistics designation

National Statistics

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Help email

nss.isdHDstroke@nhs.net

Date form completed

19 December 2017
Appendix 3 – Early access details

Pre-Release Access
Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", ISD is 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
Appendix 4 – 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](#).