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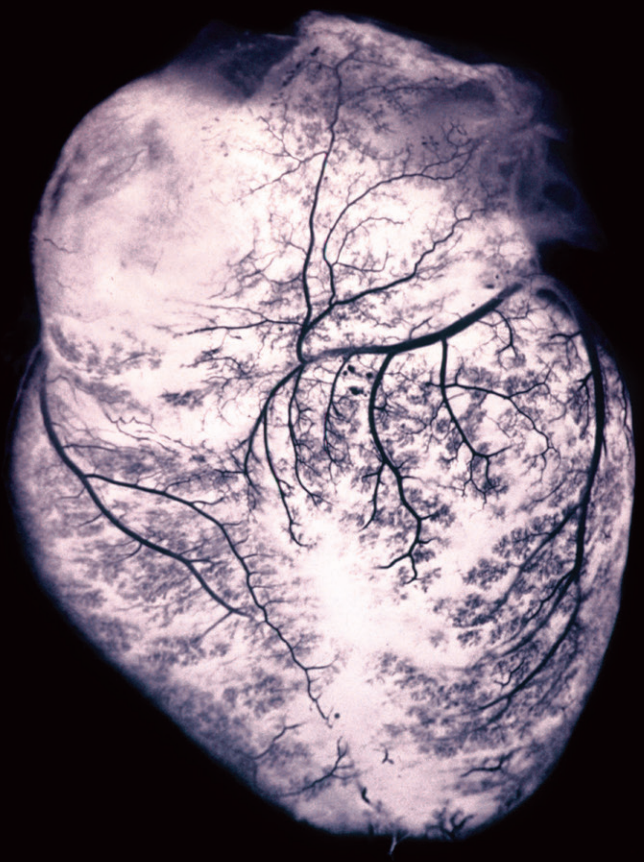
BRITISH SOCIETY FOR HEART FAILURE



NATIONAL HEART FAILURE AUDIT

APRIL 2013 - MARCH 2014

NICOR (National Institute for Cardiovascular Outcomes Research) is a partnership of clinicians, IT experts, statisticians, academics and managers which manages six cardiovascular clinical audits and four clinical registers. NICOR analyses and disseminates information about clinical practice in order to drive up the quality of care and outcomes for patients.

The British Society for Heart Failure (BSH) is a national organisation of healthcare professionals which aims to improve care and outcomes for patients with heart failure by increasing knowledge and promoting research about its diagnosis, causes and management.

The Healthcare Quality Improvement Partnership (HQIP) is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement, and in particular to increase the impact of clinical audit in England and Wales. HQIP hosts the contract to manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP). The programme comprises 40 clinical audits that cover care provided to people with a wide range of medical, surgical and mental health conditions.

Founded in 1826, UCL (University College London) was the first English university established after Oxford and Cambridge, the first to admit students regardless of race, class, religion or gender, and the first to provide systematic teaching of law, architecture and medicine. It is among the world's top universities, as reflected by performance in a range of international rankings and tables. UCL currently has 24,000 students from almost 140 countries, and more than 9,500 employees. Its annual income is over £800 million.

Authors

This report was written and compiled by Polly Mitchell, Damian Marle, Akosua Donkor, Aminat Shote, Theresa McDonagh, Suzanna Hardman, Henry Dargie, John Cleland, with input from the National Heart Failure Audit Steering Group. See Appendix A for current Steering Group membership.

Data cleaning and analysis was carried out by Aminat Shote. Data extraction and linkage was carried out by Marion Standing and Andrew Harrison.

Acknowledgments

The National Heart Failure Audit is managed by the National Institute for Cardiovascular Outcomes Research (NICOR), which is part of the National Centre for Cardiovascular Prevention and Outcomes, based at University College London. The National Heart Failure Audit is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). The Heart Failure Audit is one of the largest and oldest audits within the NICOR portfolio.

The National Heart Failure Audit was established in 2007. The BSH, with Theresa McDonagh, Henry Dargie and John Cleland, drove this initiative including developing the original audit dataset. Specialist clinical knowledge and leadership is provided by the British Society for Heart Failure (BSH) and the audit's clinical lead, Professor Theresa McDonagh. The current strategic direction and development of the audit is determined by the audit Steering Group. This includes major stakeholders in the audit, including cardiologists, the BSH, heart failure specialist nurses, clinical audit and effectiveness managers, cardiac networks, patients, NICOR managers and developers, and HQIP. See Appendix A for current Steering Group membership.

We would especially like to thank the contribution of all NHS Trusts, Welsh Heath Boards and the individual nurses, clinicians and audit teams who collect data and participate in the audit. Without this input the audit could not continue to produce credible analysis, or to effectively monitor and assess the standard of heart failure care in England and Wales.

Published on 20 October 2015. The HF Audit report is usually published ahead of the annual, autumn, meeting of the BSH to ensure maximum impact and dissemination of the findings. This report has been delayed because of difficulties accessing the HES data in a timely fashion for the year 2013-2014.

This report is available online at www.ucl.ac.uk/nicor/audits/heartfailure/reports. Hospital level tables are also published on http://data.gov.uk. Participation analysis is published at http://www.hqip.org.uk/parcar/.

Please contact hf-nicor@ucl.ac.uk for further information about the report.

National Heart Failure Audit
National Institute for Cardiovascular Outcomes Research (NICOR)
Institute of Cardiovascular Science, University College London
2nd Floor, Nomura House, 1 St. Martin's Le Grand, London EC1A 4NP

Tel: 0203 108 3929
Email: hf-nicor@ucl.ac.uk

National Heart Failure Audit

April 2013 - March 2014

The seventh annual report for the National Heart Failure Audit presents findings and recommendations based on patients with an unscheduled admission to hospital, who were discharged or died with a primary diagnosis of heart failure between 1 April 2013 and 31 March 2014. The report covers all NHS Trusts in England and Health Boards in Wales that admit patients with acute heart failure.

The report is aimed at all those involved in collecting data for the National Heart Failure Audit, including those involved in collecting data for the National Heart Failure Audit, as well as clinicians, hospital chief executives, managers, clinical governance leads commissioners, patient groups and many others. The report includes clinical findings at national and local levels and patient outcomes.

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1 Foreword

Of all of the health concerns of the general public, cancer probably ranks the highest. Yet heart failure is more likely to strike them than cancer, untreated heart failure has a worse prognosis than most cancers, heart failure patients do not all enjoy the right to a specialist consultation within two weeks, and heart failure costs the NHS more than cancer. Heart failure outcomes need not be as poor as they are and there is a long way to go before heart failure care matches the quality and consistency of care that cancer patients receive.

In spite of this it is heartening to see the National Heart Failure Audit demonstrating that care has improved steadily in the years since the audit began. Care is better as greater use is made of evidence-based treatments, as prescription of ACE inhibitors, beta blockers & MRAs becomes commonplace and as more people are having their care delivered by a specialist Multi-Disciplinary Team (MDT). However, overall mortality this year is flat and there are challenges ahead.

The ageing population and constrained budgets will continue to increase the pressure on service delivery. As a heart failure patient I see the answer in a more ruthless use of the evidence base, including optimal titration of patients on the key agents; and for every patient to be treated on a cardiology ward under the care of an MDT. The fearless holding of patients in hospital until they are ready to be discharged will reduce the yo-yoing of patients into readmission, and the use of rehabilitation with an educational component will help patients become experts in their own condition and reduce the burden on the health service.

As more care is moved into the community, so a greater integration of GPs and Heart Failure Nurse Specialists into the MDT will further elevate the quality of care. In England, such integration will benefit GPs as the commissioners and deliverers of long-term care.

In summary, I am eternally grateful for the care that I received when I was diagnosed and I want to see clinicians continue their drive for ever-improving heart failure care so that it compares with cancer treatment. I also want to see Chief Executives give clinicians the space to deliver optimal care, with its higher up-front costs but lower long-term costs as patients enjoy their lives with their families rather than coming back into hospital.

Richard Mindham
Patient Representative,
National Heart Failure Audit Steering Group

2 Summary

2.1 National Heart Failure Audit

The National Heart Failure Audit was established in 2007 to understand contemporary practice with the aim of helping clinicians improve the quality of heart failure services and to achieve better outcomes for patients. The audit aims to capture data on clinical indicators which have a proven link to improved outcomes, and to encourage the increased use of clinically recommended diagnostic tools, disease modifying treatments and referral pathways.

The audit is funded and commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of their National Clinical Audit and Patient Outcomes Programme (NCAPOP). IT development, statistical analysis and project management is provided by the National Institute for Cardiovascular Outcomes Research (NICOR), which is based in the Institute of Cardiovascular Science at University College London. The British Society for Heart Failure (BSH) provides clinical direction to the audit, with Professor Theresa McDonagh, Consultant Cardiologist at King's College Hospital, acting as the clinical lead.

The National Heart Failure Audit aims to collect data on every unscheduled admission to hospital due to heart failure, in England and Wales. These patients should all receive a coded primary diagnosis of heart failure, and numbers submitted to the audit are compared with the discharge coded episodes for heart failure. Eligible hospitals are thus those sites with unscheduled heart failure admissions. This report covers all records submitted to the audit where the date of discharge is between 1 April 2013 and 31 March 2014.

2.2 Findings

The National Heart Failure Audit for the year 2013/14 is the most comprehensive yet, with a 25% increase in data submission, yet reports very similar in-hospital and one-year mortality outcomes for people admitted to hospital with acute heart failure during the 2013/14 audit cycle to those previously reported for the 2012/13 cohort. This reflects improved prescribing rates of disease modifying therapies (see below), alongside specialist input. These findings cannot be attributed to any noteworthy difference in the age, co-morbidities or disease severity of patients across the two years but reflect better adherence to NICE and other guidelines.

Mortality rates remain variable, reflecting the diversity of clinical care alongside patient characteristics. Good clinical management by heart failure and cardiology specialists continues to result in significantly better outcomes for patients; mortality is reduced in hospital and in the month following discharge for those patients receiving this care. Furthermore, the cumulative analyses again demonstrate that the quality of care during an index admission continues to confer noticeable mortality benefit for some years following discharge.

Increasing the standard of care depends on healthcare professionals, improvement groups and commissioners using audit data to monitor performance, encourage progress, and ensure adequate provision of acute hospital heart failure care. Hospitals will also find reviewing their own audit data is a powerful tool to change and to improve practice.

The data from the HF audit has been used to model acute HF care and alongside randomised controlled trails has informed the most recent NICE Acute HF Guidance (2014), which we anticipate translating into further improvements in acute HF care in the ensuing years.

2.2.1 Participation and case ascertainment

Between April 2013 and March 2014, all 143 eligible NHS Trusts in England and all six eligible Health Boards in Wales submitted data to the audit. In England 193 out of 195 hospitals submitted data (99%), and in Wales 16 out of 17 hospitals took part (94%).

Table 1: Records submitted and case ascertainment in 2013/14

Region	Records submitted (n)	HES/PEDW primary HF discharges (n)	Case ascertainment (%)
Overall	54654	63941	85
England	51428	59820	86
Wales	3226	4121	76

To date the National Heart Failure Audit has collected and analysed data on 240,710 acute heart failure admissions (from October 2006 to March 2014). The current audit cycle is the most comprehensive to date with 55,040 acute HF admissions leaving hospital between 1 April 2013 and 31 March 2014. After data cleaning and exclusion of invalid records, the total number of records is 54,654. This is an increase of 25% from the 43,894 admissions recorded in 2012/13. This was made up of 51,428 from English hospitals and 3,226 from Welsh hospitals.

The audit represents 85% of all heart failure coded discharges or deaths in England and Wales. This comprises 51,428 heart failure admissions in England, 86% of the 59,820 patients coded as heart failure in Hospital Episode Statistics (HES), and 3,226 admissions in Wales, representing 76% of the 4,121 total recorded by the Patient Episode Database for Wales (PEDW).

2.2.2 Demographics

The patients' median age was 80 years; 67% were over 75 years. The median age at admission was almost 5 years greater in women compared to men, and approximately 5 years lower in the most socio-economically deprived quintile compared to those in the least deprived group.

Many patients had multiple co-morbidities – almost half had ischaemic heart disease, over half had hypertension, and a quarter had both. Myocardial infarction, arrhythmia and diabetes were also very common. Approximately 80% of patients were breathless on minimal exertion or at rest at first admission, and roughly 50% exhibited moderate or severe peripheral oedema.

The demographics of the patients in the 2013/14 audit cycle are very similar to those recorded last year, suggesting the audit is being implemented in a consistent fashion. Given the advanced age, disease burden, complex health issues, and the increased number of patients with these multiple co-morbidities, the reported maintenance in survival this year is particularly remarkable.

2.2.3 Hospitalisation

Half of the patients in the audit were treated on cardiology wards, 40% on general medical wards, and 11% on other wards, which includes care of the elderly (COTE). Men and younger patients were more likely to be treated on a cardiology ward.

60% of patients were seen by a consultant cardiologist, 19% by a heart failure nurse specialist, 5% by any other consultant with specialist skills for heart failure management, and, overall, 78% of patients were seen by one of more of the above heart failure specialists. Of those patients not treated on a cardiology ward, only a quarter were seen by a consultant cardiologist, though about 60% of these patients saw one or more clinicians from the specialist heart failure team.

The mean length of stay was 12 days, and the median stay was 8 days. Patients who received specialist input had longer lengths of stay than those receiving no specialist input into their management. Heart failure specialists appear more rigorous in ensuring patients receive optimal care and are stable prior to discharge, which is expected to translate into better outcomes including fewer early readmissions to hospital and a lower mortality.

2.2.4 Diagnosis

99% of patients received an electrocardiogram (ECG), and 91% had an imaging test of heart function, usually an echocardiogram (echo). Most patients (70%) had left ventricular systolic dysfunction (LVSD); 28% of patients were diagnosed with valve disease, 10% with diastolic dysfunction and 7% with left ventricular hypertrophy. These diagnoses are not mutually exclusive. Women and older patients were less likely to have LVSD to explain their heart failure.

2.2.5 Treatment

Overall prescription rates for disease modifying treatments for those patients with heart failure due to left ventricular systolic dysfunction have improved when compared with those for 2012/13.

Most (85%) patients with LVSD, and without a stated contraindication, were prescribed an ACE inhibitor, or an ARB, which is at a comparable level to the previous year but in a larger cohort of patients, 85% were prescribed a beta blocker at discharge which compares with 82% last year, and 51% were prescribed an MRA compared with just 39% in the previous cohort. However, only 41% (22,408) of patients with LVSD were prescribed all three of these disease modifying drugs. Whilst this is an increase from 39% (17,119) of patients in 2012/13, and translates into a 5% (5,290 patients), relative increase in triple therapy, it is disappointing that the opportunity to modify outcomes in so many acute HF admissions has again been missed.

The patients with HF due to LVSD who leave hospital with a prescription of these drugs have far better outcomes than those who do not. Since the prescribing rates do not include patients for whom the therapies are contraindicated arguably the prescription rates for ACE inhibitor and beta blocker should be at or near 100%, with MRAs close behind. However, prior to publication of the 2014 first NICE Acute HF guidance, there has been scope for cynics to defer these treatments, notwithstanding the clear recommendations from the ESC in the updated 2012 HF guidance.

2.2.6 Monitoring and follow-up

Over half of the patients in the audit were referred for cardiology follow-up, and almost 60% were referred for follow-up with a heart failure nurse specialist, although only 10% of patients were referred to cardiac rehabilitation services. These data suggest improving service provision compared to previous audit years. Only 4% were formally referred to specialist palliative care services; however, as many aspects of palliative care are routinely delivered by members of the heart failure team this figure needs to be interpreted with care.

Patients treated on cardiology wards and those seen by heart failure specialists were more likely to receive referrals to heart failure follow-up services, which are shown to have a beneficial impact on outcomes.

2.2.7 Hospital level analysis

For hospitals that submitted at least 50 patient records to the audit, hospital-level analysis is published for ten clinical indicators. These analyses are published to allow hospitals to benchmark their practice against each other, and against the national average.

In 2013/14 50% of all records submitted to the audit by each hospital should have all of the mandatory fields completed, that is, with no 'unknown' values. In 2014/15, 70% of all records submitted by each hospital must meet this level of completeness.

2.2.8 Mortality

In-hospital mortality has been maintained at 9.5% in 2013/14.

Mortality rates for patients who survived to discharge in 2013/14 are similar to previous years.. The maintained level of survival matches the increased prescribing rates, treatment in specialist wards, and referral to heart failure follow-up services. We hope this improvement will be sustained or increase in future years.

Despite this, there is still significant variation in mortality rates dependent on the quality of treatment received by patients. For mortality, there is marked improvement associated with treatment in a cardiology ward and prescription of evidence-based therapies, seen not only in single-variable analysis, but also in multivariate analysis, when other confounding factors are taken into account.

Notably, in-hospital mortality stood at 7% for patients treated on cardiology wards, compared to 11% for those treated on general medical wards and 14% for patients treated on other wards.

6% of patients who survived to discharge died in the 30 days following discharge.

The audit encourages hospitals to regularly review their audit data, both in order to monitor and drive changes in clinical practice, and to ensure high data quality. As of April 2014, hospitals were expected to enter data on at least 70% of heart failure discharges, which ensures a more accurate picture of the variation in the treatment and management of heart failure at a hospital level.

2.2.9 Differences between England and Wales

Healthcare service provision was devolved to Wales in 1999, since then a number of significant changes have been made to the delivery of medical care in heart failure management between Wales and England. The organisation of healthcare in both countries has been subject to major reconfiguration and the infrastructure of cardiac services in Wales is different to England.

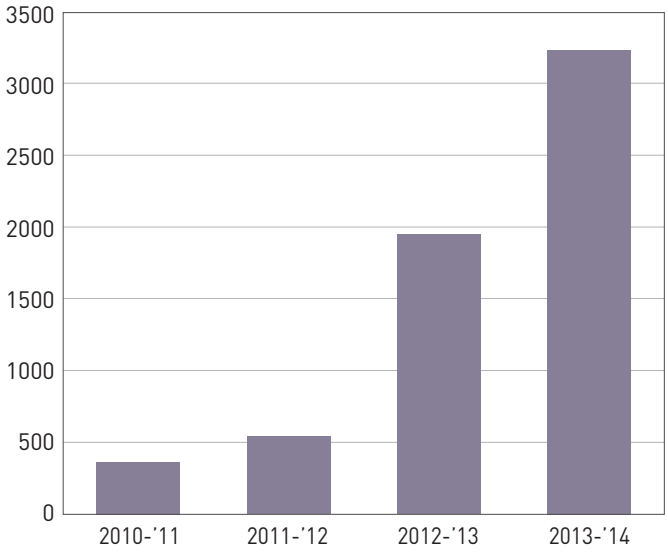
There are 2 cardiac networks in Wales (North and South), with 5 Health Boards within the South Wales Cardiac Network and 1 Health Board in the North Wales cardiac network.

All 6 eligible Welsh Health Boards submitted data to NHFA in 2013/14. There has been a clear year by year increase in the number of cases reported by Welsh centres since the NHFA began (figure 1).

Echocardiography and the use of prognostically beneficial medication ('triple therapy') in Wales for patients with LVSD based on NHFA data compares favourably with English data. However, access to Heart Failure Specialist Nurse care for these patients appears to be poorer; given the recognised mortality and morbidity benefits associated with this service, this needs to be explored further and addressed.

With the continued support of the Welsh Cardiac networks and driven by the recently published Welsh Heart Disease Delivery plan which highlights the importance of cardiac audit, the Welsh Health Boards aim to increase their participation in the NHFA; ultimately leading to improved heart failure management in Wales.

Figure 1: Number of records submitted to the National Heart Failure Audit by Welsh hospitals (2010-14)



3 Recommendations

3.1 NICE guidelines

The National Heart Failure Audit supports the clinical indicators recommended by the National Institute for Health and Care Excellence (NICE) in its existing heart failure guidelines: 'Chronic heart failure: Management of chronic heart failure in adults in primary and secondary care' (CG108) and 'Chronic heart failure quality standards' (QS9), where these are applicable to acute heart failure admissions. The first NICE guideline on Acute Heart Failure (CG 187) was published in October 2014, and so implementation is not reflected in the current audit cycle.

3.2 Data quality

The National Heart Failure Audit has developed a minimum data standard in an attempt to ensure the records submitted to the audit are fit for purpose. As the audit works towards developing a risk model over the next two years, the minimum data standard focuses on the core dataset and a reduction in the number of fields marked 'unknown'. This will maximise the number of records that can be used in the risk model. NICOR will create an online tool to monitor compliance with the minimum data standard, to allow hospitals to keep track of their progress.

3.3 Clinical coding of heart failure

The coding of heart failure continues to be problematic, and this year 9% of records were excluded if the patient did not have a confirmed diagnosis of heart failure, and did not have any clinical indication of heart failure. All acute patients with a discharge code indicating a diagnosis of heart failure should be included in the audit. This allows us to understand and report on the extent of the problems with clinical coding. If miscoded patients are identified, please discuss this with your local coding department as soon as the problem is identified.

3.4 Specialist input into care

Patients should be treated on a cardiology ward whenever appropriate and possible.

When it is not possible, or other co-morbidities suggest a different specialist ward may be provide better care, patients should still receive input from a heart failure specialist – usually a consultant cardiologist or another consultant with specific remit for heart failure patients.

3.5 Therapeutic treatment on discharge

A number of clinical guidelines advise on best practice in the treatment and management of heart failure. They consistently recommend a set of evidence-based therapies and disease management strategies.

These include using echocardiography to accurately diagnose heart failure; prescribing beta blockers, angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs) and mineralocorticoid receptor antagonists (MRAs) for patients with heart failure due to left ventricular systolic dysfunction; and the involvement of specialist heart failure clinicians in the management of heart failure patients.

4 Introduction

4.1 Heart failure

Heart Failure is a complex clinical syndrome characterised by a malfunction of the pumping action of the heart which causes high filling pressures and/or reduced cardiac output. This commonly leads to fluid retention in the lungs, causing undue breathlessness even at rest, and swelling of the legs or ankles. Heart failure may have a major adverse effect on quality of life and more than a third of patients suffer from major depression.

Heart failure is caused by abnormalities in the structure and function of the heart, for example damaged heart tissue following a heart attack, cardiomyopathy (deterioration of the heart muscle), valve disease or high blood pressure. It is thought around 70% of all heart failure cases are caused by coronary heart disease. Cardiac dysrhythmia (irregular heartbeat) and kidney dysfunction often contribute to and complicate heart failure.

Depending on the definition applied, 1-2 million people in the UK suffer from heart failure, a number that will continue to rise due to an ageing population, improved survival rates following a heart attack, and more effective treatments. British Heart Foundation (BHF) statistics estimating the incidence and prevalence of heart failure in the UK, using Clinical Practice Research Datalink (CPRD) data, show both rise steeply with age.

Heart failure results in a large burden on the NHS, accounting for around one million inpatient bed-days – 2% of the NHS total – and 5% of all emergency hospital admissions.Survival rates for heart failure patients are variable, dependent on the age and severity of disease of the patient, and the quality of care they receive. Outcomes are consistently poor for patients who receive suboptimal care, but input from heart failure specialists and prescription of evidence-based heart failure therapies have a significant impact on prognosis and life expectancy. The National Heart Failure Audit has reported around one in ten patients dying in hospital, and of those who survive between one-quarter and one-third dying within the year of their admission. However these mortality rates are beginning to reduce, reflecting more consistent implementation of guidelines for recommended practice.

A number of clinical guidelines advise on the best practice for the treatment and management of heart failure they consistently recommend a set of evidence-based therapies and disease management strategies.

This includes using echocardiography to diagnose heart failure accurately; the prescription of beta blockers, angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs) and mineralocorticoid receptor antagonists (MRAs) for patients with heart failure due to left ventricular systolic dysfunction (LVSD); and the involvement of specialist heart failure clinicians in the management of heart failure patients, both in hospital and following discharge.

4.2 The National Heart Failure Audit

Clinical audit is a quality improvement process for healthcare practitioners and providers, which aims to enhance the care of patients by systematically reviewing medical practice against explicit criteria, modifying it where necessary.

The National Heart Failure Audit was established in 2007 with the aim of helping clinicians improve the quality of heart failure services and to achieve better outcomes for patients. The audit aims to capture data on clinical indicators which have a proven link to improved outcomes, and to encourage the increased use of clinically recommended diagnostic tools, disease modifying treatments and referral pathways.

Over the past seven years, having collected over 200,000 records, the audit has consistently shown that following existing clinical guidelines for best practice results in significantly better outcomes for patients. The clinical standards used by the National Heart Failure Audit include NICE Clinical Guidance for Chronic Heart Failure (2010), NICE chronic heart failure quality standards (2011), and European Society of Cardiology guidelines for the diagnosis and treatment of acute and chronic heart failure (2012). The audit dataset corresponds to these standards and is able to evaluate the implementation of these existing evidence-based recommendations by hospitals in England and Wales.

4.3 Audit governance

The audit is funded and commissioned by the Healthcare Quality Improvement Partnership (HQIP) and, along with the five other NICOR audits, is one of around 35 audits in their National Clinical Audit and Patient Outcomes Programme (NCAPOP).

IT development, statistical analysis and project management is provided by the National Institute for Cardiovascular Outcomes Research (NICOR), which is based in the Institute of Cardiovascular Science at University College London.

The British Society for Heart Failure (BSH) provides clinical direction to the audit, with Professor Theresa McDonagh, Consultant Cardiologist at King's College Hospital, acting as the clinical lead. The BSH is a professional society for clinicians and healthcare professionals with a specialism or interest in heart failure.

The audit's development and strategy is determined by a Steering Group, which meets quarterly, and whose membership is made up of a variety of stakeholders in the audit, including cardiologists, specialist nurses, clinical audit and effectiveness managers, cardiac networks and patients. The full list of current Steering Group members can be found in appendix 1.

4.4 Dataset

The dataset covers the patient's personal and demographic information, symptoms and signs on admission.

The dataset is regularly reviewed and updated to ensure it remains in line with contemporary guidance. In April 2014 the audit dataset was revised to cut down on data items not being used strictly for audit analysis, and to ensure the data collected are sufficient to calculate risk adjusted mortality. The current dataset, the paper pro forma to aid data collection, and a user guide, can be found on the NICOR website.

4.5 Scope and methodology

The National Heart Failure Audit collects data on all patients with an unscheduled admission to hospital in England and Wales who are discharged with a coded primary diagnosis of heart failure. This is designated by the following ICD-10 codes:

- I11.0 Hypertensive heart disease with (congestive) heart failure
- I25.5 Ischaemic cardiomyopathy
- I42.0 Dilated cardiomyopathy
- I42.9 Cardiomyopathy, unspecified
- I50.0 Congestive heart failure
- I50.1 Left ventricular failure
- I50.9 Heart failure, unspecified

Patients admitted for elective procedures, for example elective pacemaker implantation or angiography, are not included. Patients must be over 18 to be eligible for inclusion in the audit.

Participation in the audit is mandated by NHS England's NHS Standard Contracts for 2013/14 and 2014/15, and by the NHS Wales National Clinical Audit and Outcome Review Plan 2013/14.

In 2013/14, Trusts have been expected to include all patients discharged with a primary diagnosis of heart failure in the audit. As a minimum, 70% of heart failure admissions – as recorded by Hospital Episode Statistics (HES) in England or Patient Episode Database of Wales (PEDW) in Wales – must be included in the audit.

Although a large proportion of the treatment of heart failure occurs in the community, the National Heart Failure Audit currently only covers unscheduled admissions to hospital. Extension of the audit to primary care is under consideration, with a pilot project in the pipeline.

4.6 Data collection and IT

All data are submitted electronically by hospital into a protected central database via a secure online database. Each hospital user can access the NICOR data collection system and submit records, view, edit and export their existing records and view online analysis based on the data currently in the database.

NICOR has designed security mechanisms that allow only authorised users to access information on the NICOR data collection and reporting system. Users are only able to see records submitted by their own organisation and published information contains only comparative analysis figures. System security meets the requirements of the Ethics and Confidentiality Committee (ECC) of the National Information Governance Board (NIGB), which has granted UCL approval under section 251 of the NHS Act 2006 to process patient identifiable audit data.

Data can be inputted manually or imported from locally developed systems and third party commercial databases such as TOMCAT, PATS and DATACAM. Cardiology units may enter their data into the central audit database in three ways:

- Direct data entry using the online data entry form, either using the web portal or Lotus Notes.
- Uploading of electronic data (in CSV file format) from existing local IT systems, currently via Lotus Notes only.

An import facility will be implemented for the web-based application by the end of 2015.

User roles vary between hospitals but the personnel involved in collecting and inputting data tend to be Heart Failure specialist nurses, clinical audit leads and clinical effectiveness managers. The time taken to manually input the core data fields for an individual patient ranges between 5 and 20 minutes depending on the complexity of the case, the quality of the clinical notes and whether the patient is known to the heart failure team or not.

4.7 Reporting

NICOR provides immediate feedback to each participating hospital on the quality of diagnosis, care and patient outcomes. This is in the form of online views which provide comparative information for each hospital about the quality of current activity against the national average, and regional and cardiac network (a collection of centres providing cardiac care within a particular geographical region) averages. These online views are currently available for all Lotus Notes users, and will be updated and made available for web portal users over the course of this contract period.

Hospitals can also export the data they submit to the database and can carry out local analysis on it.

4.8 Use of audit data

Hospital level analysis is currently published on data.gov.uk in csv format, which is publically accessible for use by any member of the public or regulatory body. The audit is currently part of NCAPOP and on the Quality Accounts list for 2014/15. Trusts must include their participation status in their Quality Account.

NICOR is currently in discussions with NHS England and Monitor about the development of a Best Practice Tariff for heart failure using National Heart Failure Audit data to evidence whether hospitals are employing good practice in the treatment and management of their heart failure patients. If the heart failure best practice tariff is chosen for inclusion in the 2015/16 best practice tariff list, participation in the audit (i.e. achieving the case ascertainment target set by the audit) and meeting a target for percentage of patients seen by a heart failure specialist is likely to be used as a measure of good practice in the first year.

4.9 Analysis

All analyses presented were performed by the NICOR analysis team. Many aspects of the analyses, including data cleaning, recoding and validity checks, were run on a set of meta-data tables curated by the team. Data recodes are reviewed annually by the clinical lead to ensure the analyses are properly specified, transparent and reproducible.

Duplicate records were identified via the combination of patients' pseudonymised NHS number, date of admission, and date of discharge. Where a duplicate is identified the most recently created record was retained for analyses. NHS numbers associated with more than one patient determined by additional fields such as age and gender were excluded as discrepant records; in addition, records with conflicting life status were excluded as discrepant records.

Mortality analyses used the index record in the analysis period and also excluded patients without an NHS number. It is not possible to identify an index record for the analytic period in order to link to mortality data and obtain the mortality status.

For almost all of the descriptive statistics presented, percentages were rounded to 0 decimal places. There were some analyses where percentage breakdowns add up to slightly more or less than 100%. This is not an error it is simply a consequence of rounding.

5 National findings

5.1 Data cleaning and data quality

The National Heart Failure Audit has collected 240,710 records of admissions to hospitals for heart failure between October 2006 and March 2014. 55,040 of these admissions had a discharge date between 1 April 2013 and 31 March 2014.

Table 2: Number of records excluded from analysis in 2013/14 analysis

Records excluded 2013/14 (n)	Records excluded 2006-14 (n)	Dataset	Reason
11	60	Total (Admission + Readmission)	Missing or invalid hospital identifier
354	3082	Total (Admission + Readmission)	Duplicate records
9	140	Total (Admission + Readmission)	Discrepant patient identifier
12	4128	Total (Admission + Readmission)	Time to discharge <0

After data cleaning and exclusion of invalid records, the total number of records was 54,654.

Table 3: Number of records excluded from mortality analysis in 2013/14

Records excluded 1-year mortality analysis (n)	Records excluded 5-year mortality analysis (n)	Reason
1124	1535	No life status
388	1306	Time from discharge to follow-up either <0 or >longest possible interval
3236	6967	Missing NHS number

The total number of patients discharged with a confirmed diagnosis of heart failure in 2013/2014 was 48080. The total number of patients without a coded diagnosis of heart failure with breathlessness, oedema, and an echo dysfunction was 3263.

5.2 Participation

In 2013/14, 213 hospitals from 143 NHS Trusts in England and six Local Health Boards in Wales discharged patients with a coded diagnosis of heart failure according to HES and PEDW.

All of these institutions submitted data to the audit – the audit has therefore succeeded in meeting its target, recruiting 100% of Trusts and Health Boards for the first time. However three hospitals did not submit any data to the audit, two in England and one in Wales:

Scarborough General Hospital (York Teaching Hospital NHS Foundation Trust)

- Trafford General Hospital (Central Manchester University Hospitals NHS Foundation Trust)
- Ysbyty Ystrad Fawr (Aneurin Bevan Health Board)

In England, 103 of the 143 eligible institutions (72%) met the National Heart Failure Audit participation requirements of submitting more than 70% of their HES-recorded heart failure discharges. 70% was chosen as the cut-off point because this was the overall case ascertainment rate aimed for in the 2012/13 audit. A further 24 Trusts (17%) submitted between 50% and 70% of their HES figures.

In Wales five Health Boards (83%) met the participation requirements.

In 2014/15, Trusts are expected to include all patients discharged with a primary diagnosis of heart failure in the audit. A minimum of 70% of HES recorded heart failure discharges meeting the audit inclusion criteria will be accepted as a minimum.

5.2.1 Number of records

In 2013/14 the National Heart Failure Audit recorded 54,654 admissions to hospital with heart failure, following data cleaning. This is an increase of 25% from the 43,894 admissions recorded in 2012/13. This was made up of 51,428 from English hospitals and 3,226 from Welsh hospitals.

5.2.2 Case ascertainment

The total number of cases where a patient was discharged with a primary diagnosis of heart failure recorded by HES and PEDW in 2013/14 was 63,941. The National Heart Failure Audit therefore currently represents 85% of all emergency heart failure admissions in England and Wales. This represents 86% of the 59,820 HES-recorded heart failure discharges in England, and 76% of the 4,121 PEDW-recorded heart failure discharges in Wales.

The number of emergency admissions to hospital with a primary discharge diagnosis of heart failure recorded by HES and PEDW is very similar to last year. In 2012/13 the audit recorded a 59% case ascertainment out of 63,341 recorded discharges. PEDW numbers remain broadly similar (4,121 in 2012/13 v. 4,165 in 2013/14). Nonetheless, the number of records submitted to the audit has increased in both England and Wales since 2012/13.

In England records were submitted on a total of 51,428 heart failure admissions, 86% of the 59,820 patients with heart failure recorded by HES in 2013/14; in Wales 3,226 records were submitted to the audit, 76% of the 4,121 total reported by PEDW in 2013/14. This marks a vast improvement on the 47% case ascertainment recorded in Wales in 2012/13.

While the 2013/14 PEDW data used for case ascertainment

is final, 2012/13 HES data is provisional as final HES data is not released until November. In 2011/12 the difference between the provisional data and the final Annual Refresh for HES Emergency Admission data was a 0.02% increase in the number of admissions. It was therefore deemed appropriate to use the provisional data as it offers a better comparator for case ascertainment than the final 2011/12 HES data. Participation and case ascertainment by hospital can be found in section 4.9 of this report.

5.2.3 Diagnosis of heart failure

Of the 54,654 patients in the 2013/14 audit, 4,859 (8.9%) were excluded from analysis in this report because the diagnosis of heart failure could not be confirmed despite having a heart failure clinical code given as their primary diagnosis on discharge.

The audit records whether a patient has been given a clinical diagnosis of heart failure as a way of determining the accuracy of the clinical coding of heart failure. A diagnosis of heart failure is defined by the audit as a diagnosis confirmed by imaging or brain natriuretic peptide (BNP) measurement either during the current admission or at a previous time. It is acknowledged that in some cases a clinician may justifiably diagnose heart failure in the absence of tests.

Patients with no clinical diagnosis of heart failure, those exhibiting either breathlessness or oedema on admission, who also had a recorded echo abnormality, were determined to have heart failure and were included in the audit. The remaining 4,859 patients were excluded from the analysis in this report on the basis they did not have heart failure. These records remain included in hospital participation and case ascertainment figures on the assumption they were coded as having heart failure on discharge from hospital.

5.3 Hospital care

5.3.1 Main place of care

As in previous years, around half of all patients were treated in a cardiology ward for the majority of their time in hospital (table 4). In addition to the 40% treated on general medical wards, 11% of patients were treated in other wards – this includes care of the elderly wards and any other specialist wards.

Table 4: Main place of care overall

	Index admissions (%)	Readmission (%)
Cardiology ward	49	51
General medical ward	40	38
Other ward	11	12

Table 5: Main place of care by sex

	Men (%)	Women (%)
Cardiology ward	54	43
General medical ward	36	45
Other ward	10	13

Table 6: Main place of care by age

	<75 years (%)	≥75 years (%)
Cardiology ward	63	42
General Medical ward	29	45
Other ward	8	13

Patients were more likely to be treated on a cardiology ward if male (table 5) and younger (table 6), men are admitted to hospital with heart failure at a younger age than women, therefore age may account for the apparent sex bias. Older heart failure patients with multiple co-morbidities may be treated on care of the elderly or generalist wards rather than specialist cardiology wards.

5.3.2 Specialist care

In April 2012 the audit added a number of new fields to its database. These included a more detailed assessment of the specialist input received by the patient. Over half of all patients were seen by a cardiologist on their index admission in 2013/14, approximately 20% were seen by a heart failure nurse specialist, and 6% were seen by another consultant with a specific remit for heart failure patients (table 7). Overall around 80% of patients were seen by a heart failure specialist in some capacity, both on first admission and on readmission.

The audit also records whether a patient was seen by a member of the heart failure multidisciplinary team (MDT). An MDT is a group of specialists which, in the case of heart failure, will be led by a consultant with an interest in heart failure, often a consultant cardiologist, and may include heart failure nurse specialists, pharmacists, dieticians, physiotherapists, psychologists and primary care physicians. The majority of patients in the audit were seen by a member of an MDT (table 7).

Table 7: Overall specialist input

	First admission (%)	Readmission (%)
Consultant cardiologist	60	63
Heart failure nurse specialist	19	18
Other consultant with interest in heart failure	5	5
Any HF specialist	78	80
Other clinician	27	26
Input from HF MDT	66	68

Table 8: HF specialist input by gender

	Men (%)	Women (%)
Consultant cardiologist	65	54
Heart failure nurse specialist	18	19
Other consultant with interest in heart failure	5	6
Any HF specialist	82	74
Other clinician	24	32
Input from HF MDT	69	62

Table 9: HF specialist input by age

	<75 years (%)	≥75 years (%)
Consultant cardiologist	74	53
Heart failure nurse specialist	15	20
Other consultant with interest in heart failure	4	6
Any HF specialist	87	74
Other clinician	19	31
Input from HF MDT	73	62

Men were more likely to have input from a heart failure specialist, and by a cardiologist, than women (table 8). They were also more likely to have input into their management by a member of the MDT. Women were more likely than men to be seen only by clinicians who do not have a heart failure specialism. Again, this is likely to be linked to the tendency for women to be treated on non-cardiology wards.

Older patients were also less likely to receive specialist input or to be seen by a cardiologist than younger patients although they were more likely to see a heart failure nurse specialist or non-cardiology consultant with an interest in heart failure (table 9).

Table 10: HF specialist input by place of care

	Cardiology ward (%)	General medical ward (%)	Other ward (%)
Consultant cardiologist	94	28	25
Heart failure nurse specialist	8	28	31
Other consultant with interest in heart failure	2	9	8
Any HF specialist	98	59	59
Other clinician	6	47	47
Input from HF MDT	80	51	56

Unsurprisingly, the vast majority of patients treated on a cardiology ward were seen by a cardiologist or another heart failure specialist (table 10).Interestingly, the majority of patients treated on general and other wards also received specialist input into their management. A quarter of patients on general medical and other wards were seen by a consultant cardiologist, and around 60% of patients on these wards were seen by a heart failure specialist.

Patients treated on cardiology wards were substantially less likely to be seen by a heart failure nurse specialist.

5.3.3 Length of stay

Both mean and median lengths of stay remain long, with considerable spread (table 10).

Table 11: Length of stay overall

	Index admission	Readmission
Mean LOS (days)	12±14	12±13
Median LOS (days)	8 (IQR 4-16)	8 (IQR 4-16)

Table 12: Length of stay by place of care

	Cardiology ward	General medical ward	Other ward
Mean LOS (days)	13±13	12±4	13±16
Median LOS (days)	9 (IQR 5-16)	7 (IQR 3-15)	8 (IQR 3-17)

Patients treated on general medical wards had shorter lengths of stay than those treated on cardiology wards and other wards; this may indicate sub-optimal treatment and premature discharge rather than good practice (table 12), especially when viewed in light of the benefits of care on cardiology wards. The long mean length of stay recorded in other wards could be due to the inclusion of care of the elderly wards in this group, which will include some of the sickest patients.

Table 13: Length of stay by specialist input

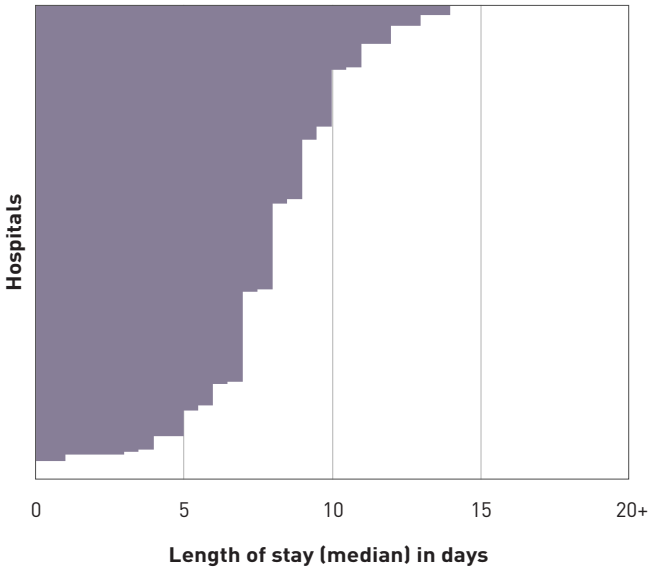
	Seen by any specialist	No specialist input
Mean LOS (days)	13±14	10±13
Median LOS (days)	9 (IQR 5-17)	6 (IQR 2-12)
Other ward	7.6	13

Table 14: Length of stay by input from MDT team

	MDT Input	No MDT input
Mean LOS (days)	13±14	10±13
Median LOS (days)	9 (IQR 5-17)	6 (IQR 3-13)
Other ward	7.6	13

Patients who had specialist input had noticeably longer mean and median lengths of stay compared to those without specialist input into their care (table 13). This provides support to the claim that specialist cardiology clinicians spend more time up-titrating therapies and ensuring stability prior to discharge, resulting in longer hospital admissions.

Figure 2: Median length of stay by hospital



5.4 Demographics

5.4.1 Age

The mean age of patients on their first admission to hospital in 2013/14 was 78 years, with a standard deviation of 12 years. The median age at first admission was 80 years. On first admission, 67% of patients were over 75.

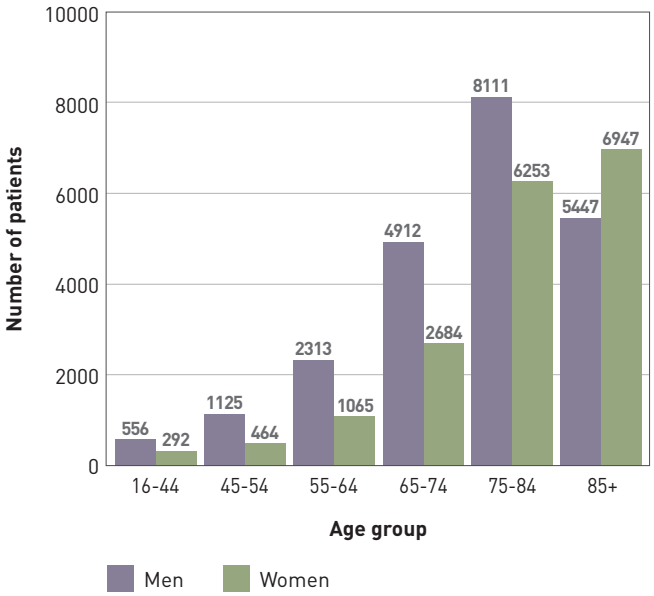
On readmission the mean age was slightly younger, at 77 years, with standard deviation of 13 years The median age at readmission was 80 years. On readmission, 67% of patients were over 75.

5.4.2 Age and gender

The mean age at first admission was 76 years for men, and 80 years for women. The majority of patients over the age of 75 were men, but there were more women over the age of 85 (figure 3).

Overall there were more men recorded in the audit than women, with men comprising 56% of the patient group at index admission and 58% at readmission. This is a very similar split to previous years.

Figure 3: Age at first admission by sex

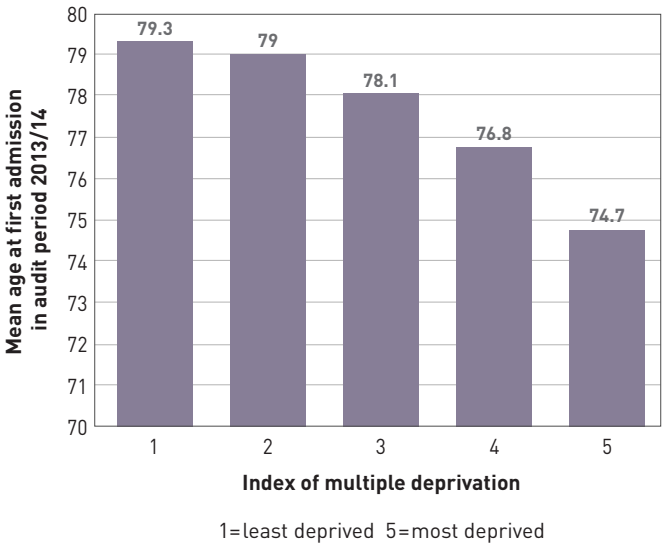


5.4.3 Index of multiple deprivation

An Index of Multiple Deprivation was assigned to each patient based on their postcode of residence. Indices of Multiple Deprivation are allocated to 34,378 areas in England and Wales, each with an average of 1,500 and a minimum of 1,000 residents. Seven factors are combined to produce a single deprivation score for each area: income deprivation; employment deprivation; health deprivation and disability; education, skills and training deprivation; barriers to housing and services; crime; and living environment deprivation.

Mean age of admission for patients in the most deprived quintile, with a deprivation score of 5, was 75 years (standard deviation 14), compared with a mean age at admission of 80 years (standard deviation 12) for patients in the least deprived quintile, with a deprivation score of 1 (figure 4). This is a difference of 4.6 years, identical to the mean age difference recorded last year (4.6 years). The median age of patients with a deprivation score of 5 was 78 years, compared to a median age of patients with a deprivation score of 1 of 82 years.

Figure 4: Deprivation and age at first admission



	1st Quintile	2nd Quintile	3rd Quintile	4th Quintile	5th Quintile
Mean	79	79	78	77	75
Median	82	81	81	79	77
SD	±12	±12	±12	±12	±14

5.5 Aetiology and comorbidity

The medical history of patients admitted to hospital with heart failure is very similar to previous years (table 15). Just under half of all patients had a history of ischaemic heart disease (IHD) and just over half had hypertension, with over a quarter of all patients in the audit suffering from both.

Arrhythmia, myocardial infarction (heart attack), diabetes and valve disease were also very common, and a number of patients also suffered from asthma or chronic obstructive pulmonary disease (COPD).

Patients with a history of ischemic heart disease (IHD), arrhythmia, myocardial infarction and renal impairment were more likely to be given a diagnosis of left ventricular systolic dysfunction (LVSD) (table 16). Patients with valve disease or hypertension were more likely to have non-systolic heart failure.

Table 15: Medical history

Medical History	Total (%)
Ischaemic heart disease (IHD)	46
Acute myocardial infarction (AMI)	29
Valve disease	24
Arrhythmia	41
Hypertension	54
Chronic renal impairment	25
Diabetes	32
Asthma	9
Coronary obstructive pulmonary disease (COPD)	18
IHD and hypertension	26

Table 16: Medical history and LVSD

Medical History	LVSD (%)	No LVSD (%)	p-value
Ischaemic heart disease (IHD)	50	40	<0.001
Atrial fibrillation	39	47	<0.001
Acute myocardial infarction (AMI)	33	20	<0.001
Valve disease	21	30	<0.001
Hypertension	51	60	<0.001
Chronic renal impairment	23	27	0.074
Diabetes	31	33	0.008
Asthma	8	10	<0.001
Coronary obstructive pulmonary disease (COPD)	17	19	<0.001

As recorded in previous years, the audit showed the majority of patients to be in NYHA class III or IV on admission; overall 80% of patients were in NYHA III/IV on first admission, and 85% on readmission (table 17).

Half of all patients exhibited moderate or severe peripheral oedema at first admission, and slightly more than half at readmission.

Table 17: Symptoms and signs of heart failure

Symptoms/sign of heart failure	Total on admission (%)	Total on readmission (%)
NYHA class I/II	19	16
NYHA class III	45	45
NYHA class IV	37	39
No/mild peripheral oedema	49	45
Moderate peripheral oedema	32	33
Severe peripheral oedema	19	22

5.6 Diagnosis

The percentage of patients receiving an echo was identical to 2012/13 in 2013/14 at 91%, indicating NICE guidelines are broadly followed; they recommend echocardiography for all patients with a previous MI or raised BNP levels (table 18). Almost all patients receive an ECG.

Table 18: Diagnostic tests

Diagnostic tests	Total received (%)
ECG	99
Echo	91

5.6.1 Echo

The vast majority of patients received an echo; this is in line with current diagnostic guidelines, but as the main diagnostic test for heart failure, almost universal usage of echo is expected (table 19).

Table 19: Receipt of echo by age

	<75 years (%)	≥75 years (%)
Received echo	95	90
Echo not done (planned)	3	4
Echo not done (not planned)	2	5

Men were more likely than women to have received an echo (table 20). These are the same as the findings in previous years.

Table 20: Receipt of echo by gender

	Men (%)	Women (%)
Received echo	93	90
Echo not done (planned)	3	5
Echo not done (not planned)	4	6

Table 21: Receipt of echo by place of care

	Cardiology ward (%)	General medical ward (%)	Other ward (%)
Received echo	97	87	87
Echo not done (planned)	1	7	5
Echo not done (not planned)	2	6	8

Similarly, in line with previous findings, patients treated on cardiology wards were more likely to receive an echo (table 21). Most striking is the difference between the percentages receiving an echo when they were treated by a specialist (95%) to the percentage receiving an echo who also received no specialist input into their care (81%) (table 22).

Table 22: Receipt of echo by specialist input

	Seen by any HF specialist (%)	No specialist input (%)
Received echo	95	81
Echo not done (planned)	2	9
Echo not done (not planned)	3	11

5.6.2 Echo diagnosis

Of those people who had an echo, the following diagnoses were given (table 23). Note that patients could be given a diagnosis of more than one of the following options. No patient with HF should have a normal echo.

Table 23: Overall echo diagnosis

Echo diagnosis	Total (%)
Normal echo	3
Left ventricular systolic dysfunction (LVSD)	70
Left ventricular hypertrophy (LVH)	7
Valve disease	28
Diastolic dysfunction	10
Other diagnosis	10

Younger patients were more likely to have HF due to LVSD, whereas in those over 75, although HF due to LVSD remained common other types of HF also increased (table 24). Of all patients who received an echo, men were more likely to be diagnosed with LVSD and women were more likely to be given a diagnosis of other types of heart failure (table 25).

Patients could be given a diagnosis of more than one of the options below, but could not be given a 'normal' echo diagnosis in combination with any other diagnosis.

Table 24: Echo diagnosis by age

Echo diagnosis	<75 years (%)	≥75 years (%)
Normal echo	3	4
Left ventricular systolic dysfunction (LVSD)	79	66
Left ventricular hypertrophy (LVH)	6	8
Valve disease	20	32
Diastolic dysfunction	9	11
Other diagnosis	10	11

Table 25: Echo diagnosis by gender

Echo diagnosis	Men (%)	Women (%)
Normal echo	3	4
Left ventricular systolic dysfunction (LVSD)	78	60
Left ventricular hypertrophy (LVH)	6	8
Valve disease	24	33
Diastolic dysfunction	9	13
Other diagnosis	10	12

5.7 Treatment on discharge for LVSD

All analyses concerning therapies prescribed on discharge only applies to those patients who were given a diagnosis of LVSD and who survived to discharge.

Prescription rates of ACE inhibitors and ARBs remain broadly similar to those recorded in 2012/13 (table 26), albeit in a larger cohort of patients. Prescription of diuretics and digoxin also remains similar to last year. Beta blocker use appears to have risen (from 82% in 2012/13 to 85%), as has use of MRA (from 39% in 2012/13 to 50%).

41% of patients were discharged on all three of the recommended therapies for heart failure – ACE inhibitor/ ARB, beta blocker and MRA. Outcomes analysis from the audit (see section 5) shows patients discharged on all three drugs have better outcomes following discharge than those. The low number of patients receiving this triple therapy is therefore disappointing.

Table 26: Overall treatment on discharge for LVSD

Medication	Total prescribed (%)
ACE inhibitor	73
ARB	19
ACE and/or ARB	85
Beta blocker	85
MRA	51
ACEI and/or ARB, beta blocker and MRA	41
Loop diuretic	91
Thiazide diuretic	5
Digoxin	22

As recorded in previous years, men are marginally more likely to be prescribed ACE inhibitors or ARBs and beta blockers and somewhat more likely to be prescribed MRAs. Men are, however, substantially more likely to receive all three (table 27). This effect is exacerbated when comparing younger and older age groups, younger patients being substantially more likely to be prescribed any of ACE inhibitors/ARBs, beta blockers or MRAs, and more likely to be prescribed all three on discharge (table 28).

Older patients are more likely to be prescribed loop diuretics than their younger counterparts (table 28). Figure 5 shows how the use of ACE inhibitors, beta blockers and MRAs declines with age, while the use of loop diuretics increases. Use of ARBs remains fairly stable across age groups.

As seen in previous years, those treated on a cardiology ward or seen by a cardiology specialist are more likely to be prescribed ACE inhibitors or ARBs, beta blockers and MRAs than those treated on general medical wards and other wards, and those not seen by a specialist doctor or nurse (tables 29 and 30).

Table 27: Treatment on discharge for LVSD by gender

Medication	Men (%)	Women (%)
ACE inhibitor	74	70
ARB	17	21
ACE and/or ARB	86	84
Beta blocker	86	84
MRA	53	47
ACEI and/or ARB, beta blocker and MRA	44	37
Loop diuretic	91	91
Thiazide diuretic	6	4
Digoxin	21	23

Table 28: Treatment on discharge for LVSD by age

Medication	<75 years (%)	≥75 years (%)
ACE inhibitor	79	68
ARB	18	19
ACE and/or ARB	90	81
Beta blocker	89	82
MRA	59	45
ACEI and/or ARB, beta blocker and MRA	51	34
Loop diuretic	88	93
Thiazide diuretic	7	4
Digoxin	21	21

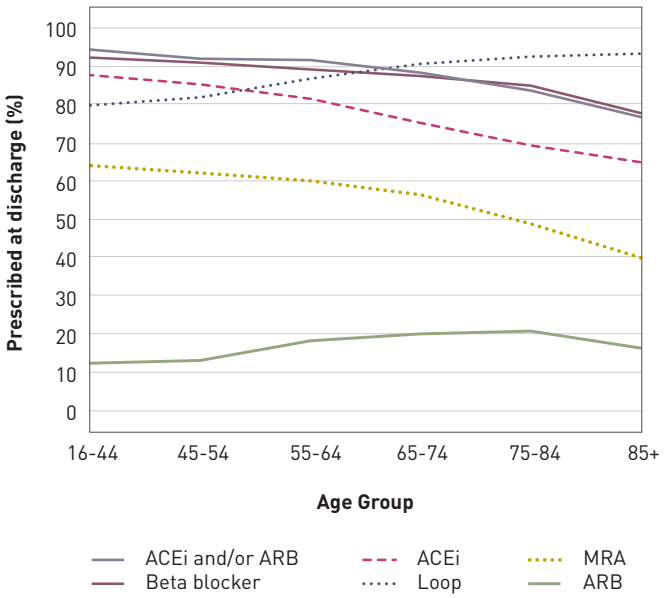
Table 29: Treatment on discharge for LVSD by place of care

Medication	Cardiology ward (%)	General medical ward (%)	Other ward (%)
ACE inhibitor	76	69	69
ARB	19	17	19
ACE and/or ARB	88	79	81
Beta blocker	88	78	80
MRA	57	47	43
ACEI and/or ARB, beta blocker and MRA	48	38	32
Loop diuretic	90	95	93
Thiazide diuretic	6	6	4
Digoxin	22	21	22

Table 30: Treatment on discharge for LVSD by specialist input

Medication	Seen by any HF specialist (%)	No specialist input (%)
ACE inhibitor	74	64
ARB	19	18
ACE and/or ARB	87	75
Beta blocker	87	74
MRA	54	34
ACEI and/or ARB, beta blocker and MRA	45	21
Loop diuretic	90	94
Thiazide diuretic	6	3
Digoxin	22	23

Figure 5: Prescription of disease modifying therapies in LVSD by age

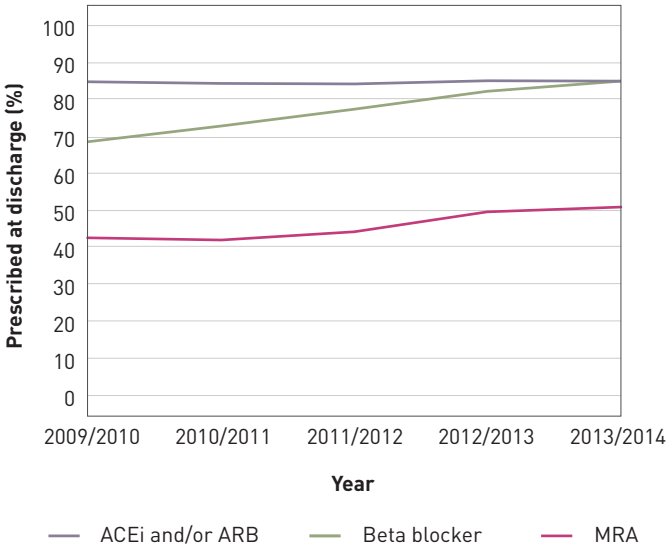


Patients treated in a cardiology ward for the majority of their admission were more likely to receive ACE inhibitors/ARBs, beta blockers and MRAs (table 29). Levels of prescription in general medical wards and other wards were similar for each of these therapies.

Cardiology patients were more likely to receive all three of these treatments than patients treated on general and other wards (table 30).

Loop diuretic prescription was high across all wards, although slightly higher in general wards.

Figure 6: Five-year trends in prescription of disease modifying therapies in LVSD



5.8 Monitoring and follow-up

Of those patients who survived to discharge, over half were referred to cardiology and heart failure nurse follow-up services (table 31). Some heart failure nurse clinics are only intended for LVSD patients, and almost 80% of all patients with a diagnosis of LVSD were referred for follow-up with a specialist nurse. Referral to specialist follow-up is associated with better outcomes, with the benefits showing even several years after discharge.

The audit records whether patients were referred to a cardiac rehabilitation programme on discharge; 10% of patients were referred to these services. This number should perhaps be higher as the Cardiovascular Disease Outcomes Strategy, published in March 2013, sets an aim for hospitals to refer a third of heart failure patients to cardiac rehabilitation programmes.

Palliative care referrals remain low, which is surprising and disappointing given the high age of the heart failure patient population and the high mortality rates within a year of discharge.

Table 31: Overall referral to follow-up services

Service	Total referred (%)
Cardiology follow-up	54
Heart failure nurse follow-up	58
Heart failure nurse follow-up (LVSD patients only)	69
Cardiac rehabilitation	10
Care of the elderly follow-up	14
GP follow-up	79
Palliative care	4

Men and younger patients were more likely than women and those over 75 to receive referrals to specialist follow-up services and cardiac rehab programmes (tables 32 and 33). The figures for cardiac rehab referrals exclude those patients for whom referral was not applicable and those who declined treatment.

Table 32: Referral to follow-up services on discharge by gender

Service	Men (%)	Women (%)
Cardiology follow-up	60	48
Heart failure nurse follow-up	63	51
Cardiac rehabilitation	12	8.4

Table 33: Referral to follow-up services on discharge by age

Service	<75 years (%)	≥75 years (%)
Cardiology follow-up	71	45
Heart failure nurse follow-up	65	53
Cardiac rehabilitation	15	8

Unsurprisingly, and as recorded in previous years, patients were also far more likely to receive specialist follow-up when treated on cardiology wards (table 34). Cardiology patients were more than twice as likely to be referred to a cardiac rehab programme.

Patients who received specialist heart failure care were around three times more likely to be referred to follow-up with a cardiologist or heart failure nurse, and twice as likely to be referred to a cardiac rehab programme on discharge (table 35).

Table 34: Referral to follow-up services on discharge by main place of care

Service	Cardiology ward (%)	General medical ward (%)	Other ward (%)
Cardiology follow-up	72	37	34
Heart failure nurse follow-up	68	47	49
Cardiac rehabilitation	15	7	4

Table 35: Referral to follow-up services on discharge by specialist input

Service	Seen by any HF specialist (%)	No specialist input (%)
Cardiology follow-up	63	23
Heart failure nurse follow-up	67	22
Cardiac rehabilitation	13	3

Table 36: Follow-up appointment with MDT

Follow-up appointment	Total (%)
Follow-up appointment with MDT scheduled	55
Appointment scheduled within two weeks of discharge	31

Over half of patients were referred for a follow-up appointment with the heart failure MDT on discharge, and a third had their appointment planned for within two weeks of leaving hospital (table 36). The NICE clinical guideline and quality standard for heart failure recommend people admitted to hospital because of heart failure receive a clinical assessment from a member of the heart failure MDT within two weeks of discharge.

5.9 Outcomes

5.9.1 Mortality measures

There are five separate mortality measures reported at the national level in this report:

- In-hospital mortality for the 2013/14 population
- In-hospital mortality for the 2009-14 population
- 30-day mortality for survivors to discharge
- Mortality for survivors to discharge in the 2013/14 population
- Mortality for survivors to discharge in the 2009-14 population

A Cox proportional hazards model was produced for each measure to show the hazards associated with risk factors for each group of patients. This year's risk adjustment is more thorough than the previous year's. A random effects Cox regression model for in-hospital analysis was implemented to account for clustering.

The survival model for the 2013/14 analysis was generated from data submitted to the audit; only 36% of patient records had complete data on all variables. Despite the 25% increase in admission records submitted to NICOR, there has been an absolute decrease of 4% in the records used in the multivariate analyses. The quality of data submitted must improve for the number of records available for multivariate regression analysis to increase.

Multiple imputation, the process of generating more than one potential dataset which the data could have been (as opposed to single imputation which fills in missing data once), was not restricted to complete case only. The imputed datasets were analysed, and their results combined appropriately to give a final result. Multiple imputation was performed in STATA.19 using the ice command, 60 imputations were performed.

In April 2012 the dataset was revised to include a series of new fields to collect information about heart rate, systolic blood pressure, and the relevant aspects of a full blood count. The mortality analyses which look at only data from 2013/14 include these factors; providing a more sophisticated risk adjustment.

The analyses of 2009-14 data used a smaller group of risks, as only the data from 2013-14 would include the recent additions to the dataset. The hazards associated with these risks in the 2009-14 analysis may be exaggerated as they do not take into account the confounding factors which are included in the 2013-14 analyses.

The main risks associated with acute heart failure are well documented; the factors included in the model were identified from the initial literature review, rather than using the data to identify risk factors from statistical significance.

After identifying the risk factors, the level of increase or decrease the continuous variable risk factors (systolic blood pressure, haemoglobin, heart rate) should be measured against was determined. There were different considerations for the different risk factors.

For blood pressure, a 10 mmHG increase is standardly cited in the literature; with other variables the spread of the data determined what unit increase to use – haemoglobin had a very small spread, so a decrease of 1g/dL was used as a measure of hazard. Conversely, creatinine had a very large spread, so an increase of 10umol/L was used. As potassium is a U-shaped variable, with both low and high values conferring an increased risk, four levels were used to measure the hazard of different potassium levels. These were determined based on clinical judgement of normal measurements. Consistently having a low potassium (≤3.5 mEq/L) was a greater hazard than having a slightly high potassium level (4.5-5.5 mEq/L), and having a very high potassium (>5.5 mEq/L) is associated with the greatest hazard.

A patient's length of stay in hospital appeared to be a linear variable with higher mortality hazard associated with a longer length of stay. All-cause and cardiovascular mortality is distinguished in the analysis of survival post discharge.

The Cox regression analysis had a low proportion of complete records available for analysis; this was due to the addition of established risk factors as core fields following the dataset revision in 2012. For 31 (14.9%) hospitals there were no records eligible for a complete case multivariate Cox regression analysis as a result of missing data in these fields. 26 of these hospitals submitted at least 30 records to the audit in the report year.

At least 90% of records submitted by Colchester General Hospital, Queen Alexandra Hospital, Royal Derby Hospital and Salisbury District Hospital contributed to the regression analyses, but on average 41% of the data submitted by hospitals contributed to the regression analysis. It is important that complete data – especially fields relevant to all audit analyses – is submitted to eliminate bias introduced by incomplete records.

Currently 66 (31.7%) hospitals submitted at least 50% of valid post-discharge data in all regression analysis fields, which is a decrease from 36.4% in 2012/2013 audit year. We expected hospitals to submit at least 50% of information required in the regression analysis fields by 2013/2014 and anticipate 70% by 2014/2015.

As a result of high level of missingness a more thorough analysis is required since bias is introduced by the exclusion of patient records, but there were similarities in results obtained from both imputed and complete case analyses.

5.9.2 In-hospital death

Although it remains high, overall in-hospital mortality for 2013/14 appears to have maintained at 9.5% 2012/13 (table 38). Predictably, in-hospital mortality rates increase with age, with patients over 75 years being more than twice as likely to die in hospital as those in the under-75 age group. Age is a strong predictor of mortality even when other variables are accounted for (table 37). Women and men had similar mortality rates (table 38).

As with the in-hospital mortality reported in previous years, in-hospital mortality varies by the main place of care of the patient. Only 7% of patients treated in cardiology wards died in hospital compared with 11% of patients treated on general medical wards and 14% of patients treated on other wards.

Over the four year period from 2009-2013, mortality rates were very similar to the one-year findings for 2013/14 (table 39).

Table 37: In-hospital mortality random effects cox proportional hazards model (2013/14)

n=17272	HR	Lower CI	Upper CI	p-value
Age (≥75 year)	1.81	1.57	2.10	<0.001
Not cardiology in patient	1.76	1.57	1.97	<0.001
NYHA III/IV	1.19	1.02	1.39	0.026
Systolic blood pressure (10 mm Hg decrease)	1.14	1.12	1.17	<0.001
Female	1.13	1.01	1.26	0.031
Urea (5 mEq/dL increase)	1.12	1.10	1.14	<0.001
COPD	1.07	0.94	1.22	0.280
Heart rate (5 bpm increase)	1.06	1.04	1.07	<0.001
Ischaemic heart disease	1.05	0.95	1.17	0.350
Valve disease	1.05	0.93	1.18	0.400
Haemoglobin (g/dL increase)	1.04	1.01	1.06	0.011
Sodium (5 mEq/L decrease)	1.02	0.97	1.07	0.440
Creatinine (10 umol/L increase)	1.02	1.02	1.03	<0.001
Potassium <3.5 (mEq/L)	1.35	1.12	1.62	0.002
Potassium 3.5-4.5 (mEq/L)	1			
Potassium 4.5-5.5 (mEq/L)	1.37	1.22	1.54	<0.001
Potassium >5.5 (mEq/L)	2.21	1.83	2.66	<0.001

Table 38: In-hospital mortality (2013/14)

Analysis	Variable	Records (n)	Deaths (n)	Mortality (%)
Overall mortality	Overall mortality	38947	3718	9.5
Gender	Women	17180	1751	10.2
Gender	Men	21738	1963	9.0
Age	Age group 16-74	13071	613	4.7
Age	Age group 75+	25867	3102	12.0
Main place of care	Cardiology	19006	1306	6.9
Main place of care	General medicine	15340	1750	11.4
Main place of care	Other	4322	593	13.7
Specialist input	No specialist input	8299	1234	14.9
Specialist input	Specialist input	29786	2302	7.7

Table 39: In-hospital mortality random effects cox proportional hazards model (2009-14)

n=116624	HR	Lower CI	Upper CI	p-value
Age (≥75 year)	1.79	1.70	1.88	<0.001
Not cardiology in patient	1.53	1.47	1.60	<0.001
NYHA III/IV	1.30	1.24	1.38	<0.001
Ischaemic heart disease	1.12	1.08	1.17	<0.001
Valve disease	1.13	1.08	1.18	<0.001
Female	1.09	1.04	1.13	<0.001

Table 40: In-hospital mortality (2009-14)

Analysis	Variable	Records (n)	Deaths (n)	Mortality (%)
Overall mortality	Overall mortality	138700	13096	9.4
Gender	Women	61010	6293	10.3
Gender	Men	77614	6795	8.8
Age	Age group 16-74	47902	2241	4.7
Age	Age group 75+	90790	10853	12.0
Main place of care	Cardiology	66717	4507	6.8
Main place of care	General medicine	56851	6481	11.4
Main place of care	Other	14723	2045	13.9

5.9.3 Trends in in-hospital death

The rate of in-hospital deaths have stayed approximately the same between 2012/13 and 2013/14 despite the increase in patient records available for analysis (figure 7). This indicates that patients are not being 'cherry-picked' for inclusion in the audit, and is further evidence for the representativeness of the sample collected by the audit.

Figure 7: Trend in in-hospital mortality (2009-14)

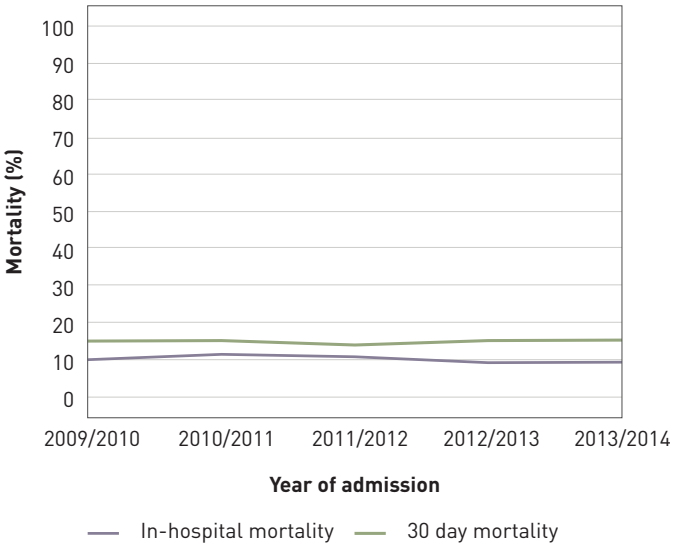
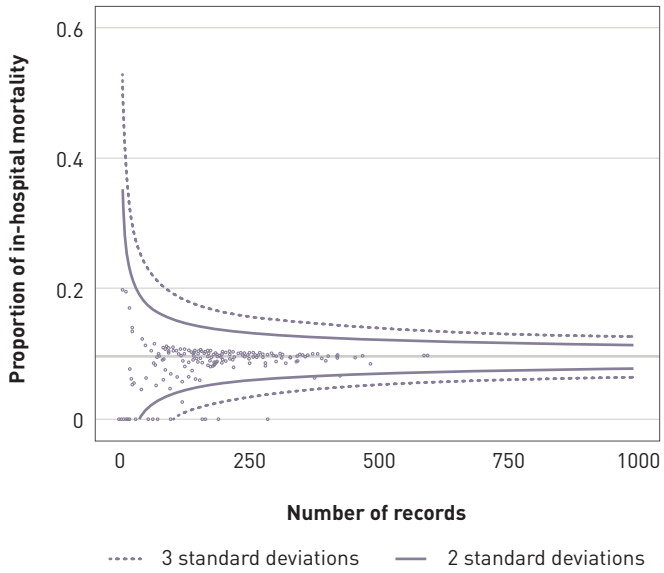


Figure 8: Adjusted in-hospital mortality by hospital 2013/2014



The in-hospital mortality funnel plot was derived from a logistic regression model with random effects on hospital adjusting for age, gender, treatment ward and length of stay. It shows some association between the number of patients treated and the outcome i.e. higher mortality.

5.10 Post discharge mortality rates

5.10.1 30-day mortality

Overall 30 day mortality for 2013/14 was 6.2%, (table 40). Predictably, 30-day mortality rates increase with age, with patients over 75 years being more than twice as likely to die as those in the under-75 age group. Women and men had similar mortality rates (table 41).

Age is a strong predictor of death even when other variables are accounted for (table 41).

As with the in-hospital mortality reported in previous years, 30 day mortality varies by the main place of care of the patient: only 5.4% of patients treated in cardiology wards died within 30 days of discharge from hospital, compared with 6.8 % of patients treated on general medical wards and 8.3% of patients treated on other wards (table 42).

Table 41: All-cause 30-day mortality cox proportional hazards model (2013/14)

Analysis	Variable	Records (n)	Deaths (n)	Mortality (%)
Overall mortality	Overall mortality	35229	2200	6.2
Gender	Women	15429	945	6.1
Gender	Men	19775	1254	6.3
Age	Age group 16-74	12458	444	3.6
Age	Age group 75+	22765	1755	7.7
Main place of care	Cardiology	17700	954	5.4
Main place of care	General medicine	13590	925	6.8
Main place of care	Other	3729	309	8.3
Specialist input	No specialist input	7065	530	7.5
Specialist input	Specialist input	27484	1627	5.9
Diagnosis	No LVSD	12122	737	6.1
Diagnosis	LVSD	22340	1404	6.3
ACE inhibitor (all)	No ACE inhibitor	9327	676	7.2
ACE inhibitor (all)	ACE inhibitor	18390	690	3.8
ACE inhibitor (LVSD only)	No ACE inhibitor	4951	367	7.4
ACE inhibitor (LVSD only)	ACE inhibitor	13159	503	3.8
ACEI/ARB (all)	No ACEI or ARB	6039	554	9.2
ACEI/ARB (all)	ACEI and/or ARB	22900	839	3.7
ACEI/ARB (LVSD only)	No ACEI or ARB	2839	292	10.3
ACEI/ARB (LVSD only)	ACEI and/or ARB	16028	590	3.7
Beta Blockers (all)	No beta blocker	6357	495	7.8
Beta Blockers (all)	Beta blocker	24134	1225	5.1
Beta Blockers (LVSD)	No beta blocker	2993	262	8.8
Beta Blockers (LVSD)	Beta blocker	16804	857	5.1
Loop diuretic (all)	No loop diuretics	2628	177	6.7
Loop diuretic (all)	Loop diuretics	31012	1781	5.7
Loop diuretic (LVSD)	No loop diuretics	1957	119	6.1
Loop diuretic (LVSD)	Loop diuretics	19262	1127	5.9
Additive drugs	No ACEI/ARB, beta blocker or MRA	1776	203	11.4
Additive drugs	Discharged on ACEI/ARB only	2122	86	4.1
Additive drugs	Discharged on ACEI/ARB and beta blocker	7349	270	3.7
Additive drugs	Discharged on ACEI/ARB, beta blocker and MRA	8077	274	3.4
Additive drugs (LVSD only)	No ACEI/ARB, beta blocker or MRA	661	93	14.1
Additive drugs (LVSD only)	Discharged on ACEI/ARB only	1054	45	4.3
Additive drugs (LVSD only)	Discharged on ACEI/ARB and beta blocker	5056	186	3.7
Additive drugs (LVSD only)	Discharged on ACEI/ARB, beta blocker and MRA	6666	226	3.4
Discharge planning	No discharge planning	3111	231	7.4
Discharge planning	Discharge planning	29590	1770	6.0
HF nurse follow-up	No HF nurse follow-up	14298	1013	7.1
HF nurse follow-up	HF nurse follow-up	19321	1040	5.4
Cardiology follow-up	No cardiology follow-up	15502	1357	8.8
Cardiology follow-up	Cardiology follow-up	18400	685	3.7

Table 42: All-cause 30-day mortality from admission cox proportional hazards model (2013/14)

n=12943	HR	Lower CI	Upper CI	p-value
No cardiology follow-up	1.92	1.60	2.31	<0.001
No ACE inhibitor and/ or ARB	1.56	1.31	1.85	<0.001
No Loop diuretics	1.55	1.19	2.02	0.001
Age (≥75 year)	1.49	1.23	1.82	<0.001
NYHA III/IV	1.37	1.09	1.72	0.006
Ischaemic heart disease	1.23	1.05	1.45	0.010
Sodium (5 mEq/L decrease)	1.17	1.09	1.26	<0.001
Systolic blood pressure (10 mm Hg decrease)	1.13	1.09	1.18	<0.001
No beta blocker	1.12	0.93	1.34	0.220
Urea (5 mEq/dL increase)	1.11	1.07	1.15	<0.001
Not cardiology in patient	1.08	0.91	1.29	0.370
Male	1.05	0.89	1.24	0.590
COPD	1.04	0.85	1.27	0.730
Haemoglobin (g/dL decrease)	1.03	0.99	1.07	0.150
Creatinine (10 umol/L increase)	1.02	1.01	1.03	0.001
Length of stay 0- 4 days	1			
Length of stay 5-8 days	1.03	0.79	1.33	0.830
Length of stay 9-15 days	1.17	0.92	1.50	0.210
Length of stay ≥16 days	2.12	1.70	2.65	<0.001

Figure 9: 30-day all-cause mortality from admission

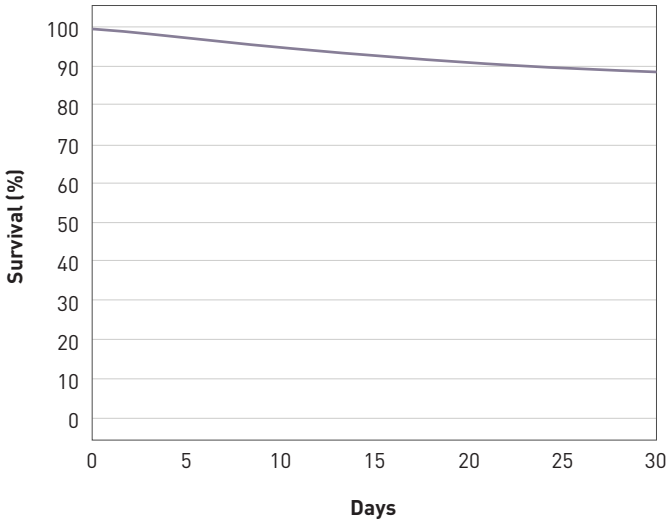
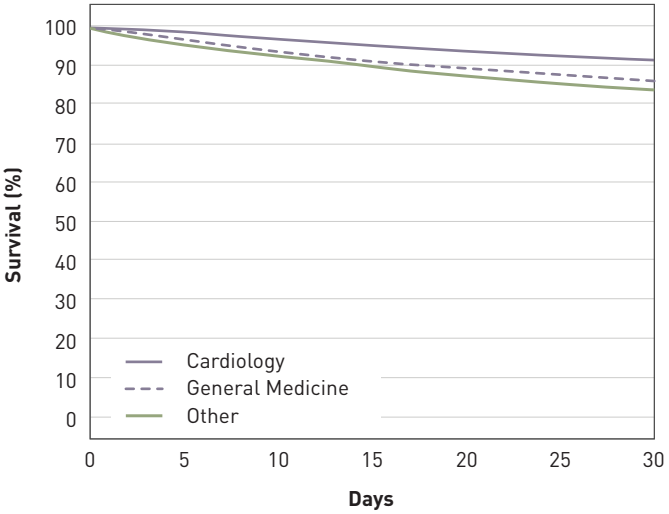


Figure 10: 30-day all-cause mortality from admission by place of care



No. at risk							
Cardiology	19015	18746	18420	18160	17872	17633	17445
General Medicine	15342	14878	14443	14080	13787	13534	13302
Other	4322	4144	4033	3903	3804	3728	3648

5.10.2 One-year mortality (2013/14)

The overall one-year mortality rate for 2013/14 is 27%. As with the 30 day mortality analysis, place of care, specialist input and age have the greatest influence upon reducing one-year mortality.

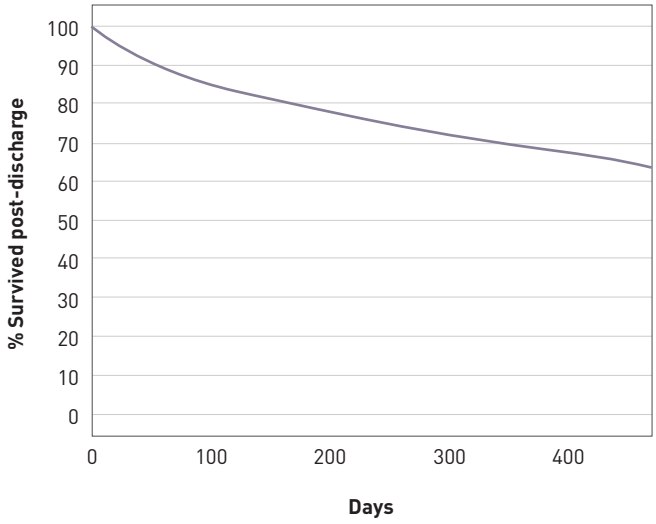
Table 43: One year mortality (2013/14)

Analysis	Variable	Records (n)	Deaths (n)	Mortality (%)	Median follow-up (days)
Overall mortality	Overall mortality	35229	9593	27%	216
Main place of care	Cardiology	17700	4126	23%	245
Main place of care	General medicine	13590	4200	31%	232
Main place of care	Other	3729	1201	32%	218
Specialist input	No specialist input	7065	2260	32%	231
Specialist input	Specialist input	27484	7141	26%	238
Age	16-74	12458	2058	17%	267
Age	75+	22765	7530	33%	220
Gender	Women	15429	4188	27%	236
Gender	Men	19775	5398	27%	237
Diagnosis	No LVSD	12122	3485	29%	232
Diagnosis	LVSD	22340	5858	26%	239
ACE inhibitor (all)	No ACE inhibitor	9327	2941	32%	228
ACE inhibitor (all)	ACE inhibitor	18390	3872	21%	252
ACE inhibitor (LVSD only)	No ACE inhibitor	4951	1588	32%	228
ACE inhibitor (LVSD only)	ACE inhibitor	13159	2634	20%	253
ACEi/ARB (all)	No ACEi or ARB	6039	2190	36%	213
ACEi/ARB (all)	ACEi and/or ARB	22900	4825	21%	253
ACEi/ARB (LVSD only)	No ACEi or ARB	2839	1117	39%	206
ACEi/ARB (LVSD only)	ACEi and/or ARB	16028	3224	20%	253
Beta Blockers (all)	No beta blocker	6357	2076	33%	226
Beta Blockers (all)	Beta blocker	24134	5882	24%	244
Beta Blockers (LVSD)	No beta blocker	2993	1032	34%	224
Beta Blockers (LVSD)	Beta blocker	16804	3915	23%	246
Loop diuretic (all)	No loop diuretics	2628	549	21%	257
Loop diuretic (all)	Loop diuretics	31012	8508	27%	236
Loop diuretic (LVSD)	No loop diuretics	1957	370	19%	258
Loop diuretic (LVSD)	Loop diuretics	19262	5130	27%	238
Additive drugs	No ACEI/ARB, beta blocker or MRA	1776	660	37%	209
Additive drugs	Discharged on ACEI/ARB only	2122	534	25%	246
Additive drugs	Discharged on ACEI/ARB and beta blocker	7349	1464	20%	255
Additive drugs	Discharged on ACEI/ARB, beta blocker and MRA	8077	1461	18%	258
Additive drugs (LVSD only)	No ACEI/ARB, beta blocker or MRA	661	289	44%	189
Additive drugs (LVSD only)	Discharged on ACEI/ARB only	1054	266	25%	245
Additive drugs (LVSD only)	Discharged on ACEI/ARB and beta blocker	5056	978	19%	254
Additive drugs (LVSD only)	Discharged on ACEI/ARB, beta blocker and MRA	6666	1142	17%	259
HF nurse follow-up	No HF nurse follow-up	14298	4130	29%	237
HF nurse follow-up	HF nurse follow-up	19321	4976	26%	237
Cardiology follow-up	No cardiology follow-up	15502	5298	34%	217
Cardiology follow-up	Cardiology follow-up	18400	3841	21%	253
Discharge planning	No discharge planning	3111	1003	32%	264
Discharge planning	Discharge planning	29590	7898	27%	234
Cardiac rehabilitation	No cardiac rehabilitation	26790	7352	27%	234
Cardiac rehabilitation	Cardiac rehabilitation	3127	548	18%	260

Table 44: All-cause one-year post-discharge mortality cox proportional hazards model (2013/14)

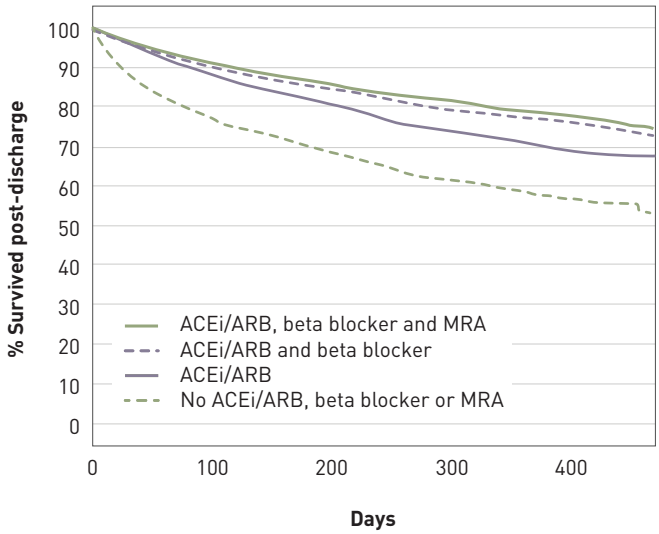
	Complete case, n=12690				Imputed, n=35229 (60 Imputations)			
	HR	Lower CI	Upper CI	p-value	HR	Lower CI	Upper CI	p-value
Age (≥75 year)	1.86	1.70	2.04	<0.001	1.81	1.72	1.91	<0.001
No cardiology follow-up	1.50	1.38	1.62	<0.001	1.47	1.41	1.54	<0.001
No ACE inhibitor and/or ARB	1.46	1.35	1.58	<0.001	1.39	1.32	1.47	<0.001
COPD	1.22	1.11	1.33	<0.001	1.22	1.16	1.28	<0.001
Ischaemic heart disease	1.22	1.13	1.31	<0.001	1.12	1.08	1.17	<0.001
Valve disease	1.22	1.13	1.32	<0.001	1.21	1.16	1.27	<0.001
Not cardiology in patient	1.13	1.05	1.22	0.002	1.14	1.09	1.20	<0.001
No beta blocker	1.12	1.03	1.21	0.01	1.12	1.06	1.18	<0.001
Sodium (5 mEq/L decrease)	1.11	1.07	1.15	<0.001	1.12	1.09	1.14	<0.001
Systolic blood pressure (10 mm Hg decrease)	1.09	1.07	1.11	<0.001	1.11	1.09	1.12	<0.001
Urea (5 mEq/dL increase)	1.07	1.05	1.09	<0.001	1.08	1.07	1.09	<0.001
Haemoglobin (g/dL decrease)	1.06	1.04	1.08	<0.001	1.05	1.04	1.06	<0.001
Male	1.05	0.98	1.14	0.167	1.10	1.05	1.15	<0.001
NYHA III/IV	1.05	0.96	1.15	0.312	1.18	1.12	1.25	<0.001
Creatinine (10 umol/L increase)	1.02	1.01	1.02	<0.001	1.01	1.01	1.01	<0.001
Potassium <3.5 (mEq/L)	1.24	1.09	1.41	0.001	1.20	1.10	1.30	<0.001
Potassium 3.5-4.5 (mEq/L)	1				1			
Potassium 4.5-5.5 (mEq/L)	1.07	0.98	1.16	0.124	1.06	1.00	1.11	0.048
Potassium >5.5 (mEq/L)	1.41	1.17	1.70	<0.001	1.22	1.08	1.38	0.001
Length of stay 0-4 days	1				1			
Length of stay 5-8 days	1.14	1.03	1.28	0.016	1.16	1.09	1.24	<0.001
Length of stay 9-15 days	1.28	1.15	1.42	<0.001	1.33	1.25	1.41	<0.001
Length of stay ≥16 days	1.81	1.63	2	<0.001	1.77	1.67	1.88	<0.001

Figure 11: All-cause mortality following discharge from hospital (2013/14)



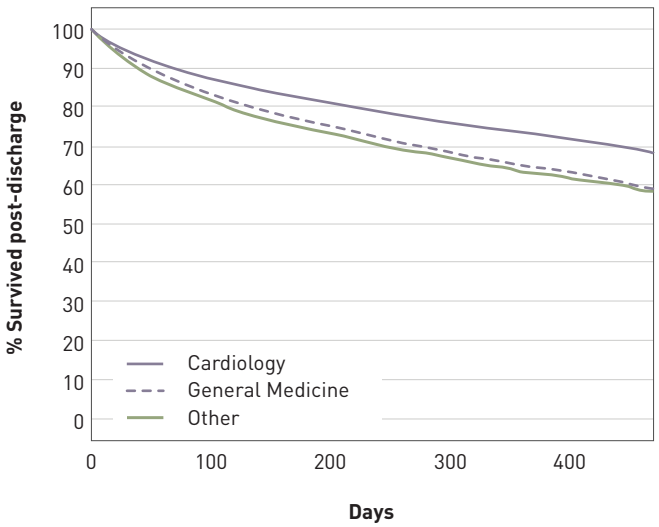
No. at risk					
All	35229	29905	20785	12668	5569

Figure 12: All-cause mortality following discharge from hospital by additive drug treatment on discharge (2013/14)



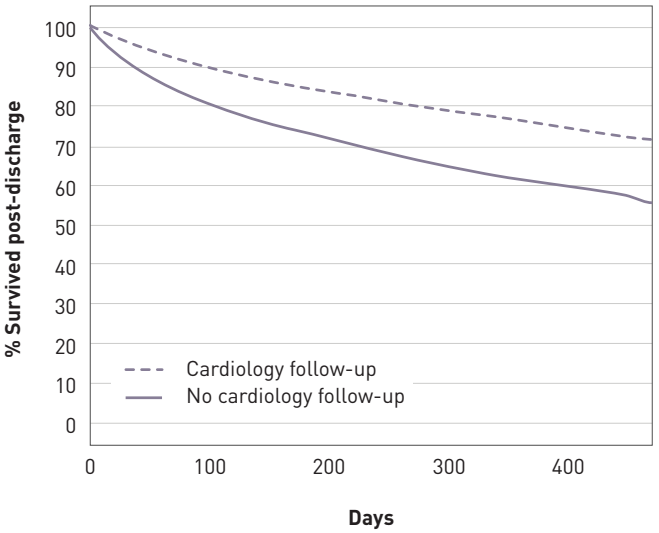
No. at risk					
ACE/ARB	2122	1877	1318	794	369
ACEi/ARB and beta blocker	7349	6611	4703	2976	1368
ACEi/ARB, beta blocker and MRA	8077	7343	5234	3190	1402
No ACEi/ARB, beta blocker or MRA	1776	1365	916	557	236

Figure 13: All-cause mortality following discharge from hospital by place of care (2013/14)



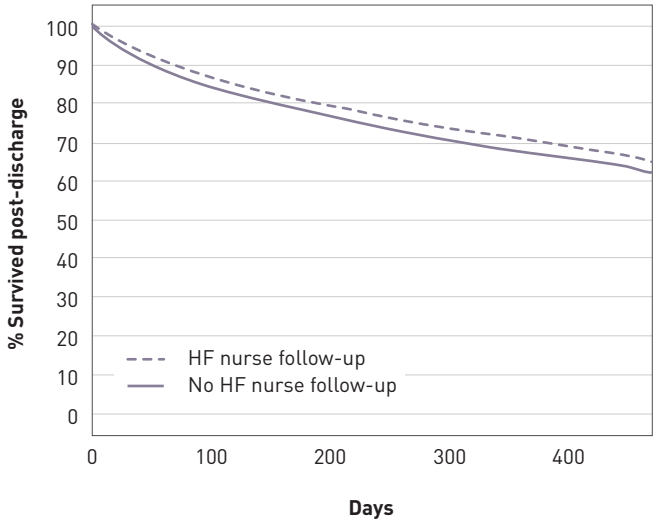
No. at risk					
Cardiology	17700	15411	10835	6664	2838
General Medicine	13590	11303	7841	4733	2144
Other	3729	3031	2045	1237	565

Figure 14: All-cause mortality following discharge from hospital by cardiology follow up (2013/2014)



No. at risk					
No	15502	12409	8338	4972	2184
Yes	18400	16455	11688	7215	3155

Figure 15: All-cause mortality following discharge from hospital by heart failure nurse follow up (2013/2014)



No. at risk					
No	14298	11981	8426	5112	2252
Yes	19321	16609	11448	6991	3076

5.10.3 Five-year mortality (2009-14)

Overall the five year mortality for 2009-14 is 45.5%, (table 44). Predictably, these mortality rates increase with age, with patients over 75 years almost twice as likely to die as those in the under-75 age group. Women and men had approximately similar mortality rates (table 45). Five year mortality varies by the main place of care of the patient, those cared for in a cardiology setting have a lower mortality rate than those in non-cardiology settings (table 45).

Age is the strongest predictor of death even when other variables are accounted for (table 46).

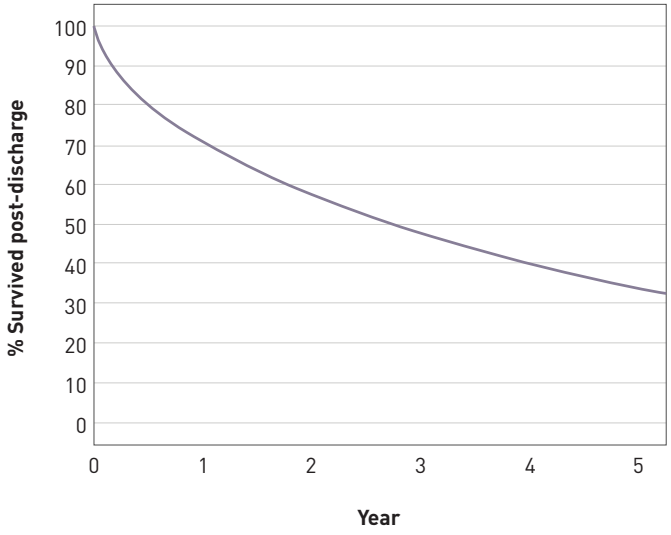
Table 45: Five year mortality (2009-14)

Variable	Analysis	Records (n)	Deaths (n)	Mortality (%)	Median follow-up (days)
Overall mortality	Overall mortality	125604	57169	45.5	473
Main place of care	Cardiology	62210	24368	39.2	527
Main place of care	General medicine	50370	26004	51.6	441
Main place of care	Other	12678	6679	52.7	402
Age	16-74	45661	13419	29.4	643
Age	75+	79937	43746	54.7	402
Gender	Women	54717	25543	46.7	463
Gender	Men	70819	31593	44.6	483
Diagnosis	No LVSD	42701	21187	49.6	441
Diagnosis	LVSD	79186	33967	42.9	493
ACE inhibitor (all)	No ACE inhibitor	35724	18825	52.7	366
ACE inhibitor (all)	ACE inhibitor	71344	28713	40.2	546
ACE inhibitor (LVSD only)	No ACE inhibitor	18659	9681	51.9	434
ACE inhibitor (LVSD only)	ACE inhibitor	50148	18956	37.8	561
ACEI/ARB (all)	No ACEI or ARB	22885	13274	58.0	366
ACEI/ARB (all)	ACEI and/or ARB	87211	35200	40.4	546
ACEI/ARB (LVSD only)	No ACEI or ARB	10663	6236	58.5	352
ACEI/ARB (LVSD only)	ACEI and/or ARB	60090	23003	38.3	557
Discharge by use of BB	Not discharged on BB	31671	17999	56.8	456
Discharge by use of BB	Discharged on BB	79493	31668	39.8	500
Beta Blockers (LVSD)	No beta blocker	15595	8860	56.8	458
Beta Blockers (LVSD)	Beta blocker	55495	20964	37.8	520
Loop diuretic (all)	Not discharged on loop diuretics	10935	3840	35.1	595
Loop diuretic (all)	Discharged on loop diuretics	109447	50892	46.5	467
Loop diuretic (LVSD)	Not discharged on loop diuretics	7829	2384	30.5	628
Loop diuretic (LVSD)	Discharged on loop diuretics	67887	30132	44.4	484
Additive drugs	No ACEI/ARB, beta blocker or MRA	8138	5088	62.5	345
Additive drugs	Discharged on ACEI/ARB only	12680	6561	51.7	569
Additive drugs	Discharged on ACEI/ARB and beta blocker	29736	11104	37.3	586
Additive drugs	Discharged on ACEI/ARB, beta blocker and MRA	25883	8773	33.9	546
Additive drugs (LVSD only)	No ACEI/ARB, beta blocker or MRA	3060	1991	65.1	302
Additive drugs (LVSD only)	Discharged on ACEI/ARB only	6499	3396	52.3	559
Additive drugs (LVSD only)	Discharged on ACEI/ARB and beta blocker	20469	7333	35.8	601
Additive drugs (LVSD only)	Discharged on ACEI/ARB, beta blocker and MRA	21016	6751	32.1	553
HF nurse follow-up	No HF nurse follow-up	53449	25802	48.3	458
HF nurse follow-up	HF nurse follow-up	66002	28388	43.0	490
Cardiology follow-up	No cardiology follow-up	55773	30450	54.6	402
Cardiology follow-up	Cardiology follow-up	64794	24010	37.1	552

Table 46: All-cause 5 year post-discharge mortality cox proportional hazards model (2009-14)

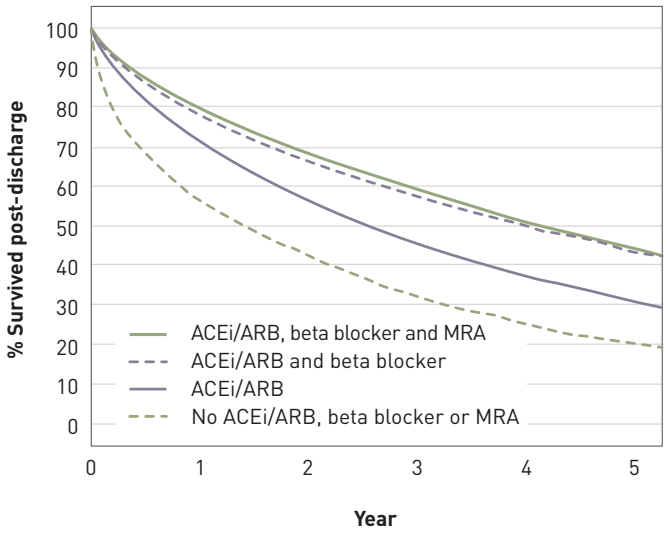
n=83547	HR	Lower CI	Upper CI	p-value
Age (≥75 year)	1.99	1.94	2.04	<0.001
No ACE inhibitor and/ or ARB	1.44	1.41	1.48	<0.001
No cardiology follow-up	1.38	1.35	1.41	<0.001
No beta blocker	1.26	1.24	1.29	<0.001
Valve disease	1.25	1.22	1.28	<0.001
Ischaemic heart disease	1.25	1.22	1.28	<0.001
Loop Diuretics	1.24	1.20	1.30	<0.001
Not cardiology in patient	1.15	1.12	1.17	<0.001
Male	1.14	1.12	1.17	<0.001
NYHA III/IV	1.13	1.10	1.16	<0.001
Length of stay 0- 4 days	1			
Length of stay 5- 8 days	1.22	1.18	1.25	<0.001
Length of stay 9-15 days	1.45	1.41	1.49	<0.001
Length of stay ≥16 days	1.86	1.80	1.91	<0.001

Figure 16: All-cause mortality following discharge from hospital (2009-14)



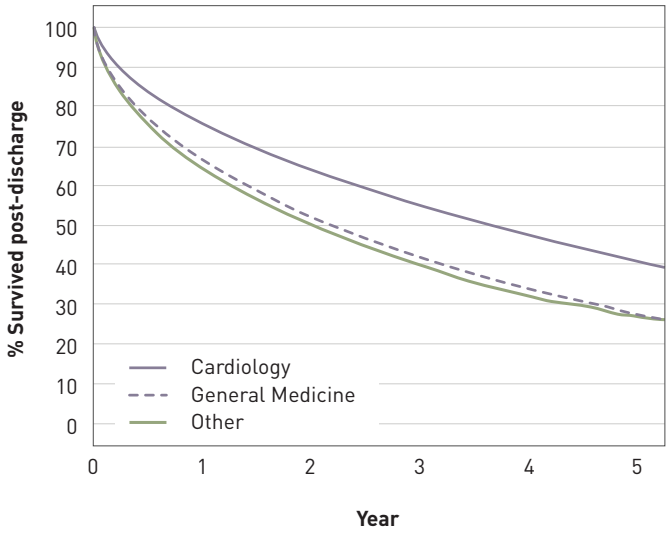
No. at risk						
All	125604	74015	43646	23880	10086	1631

Figure 17: All-cause mortality following discharge from hospital by additive drug treatment on discharge (2009-14)



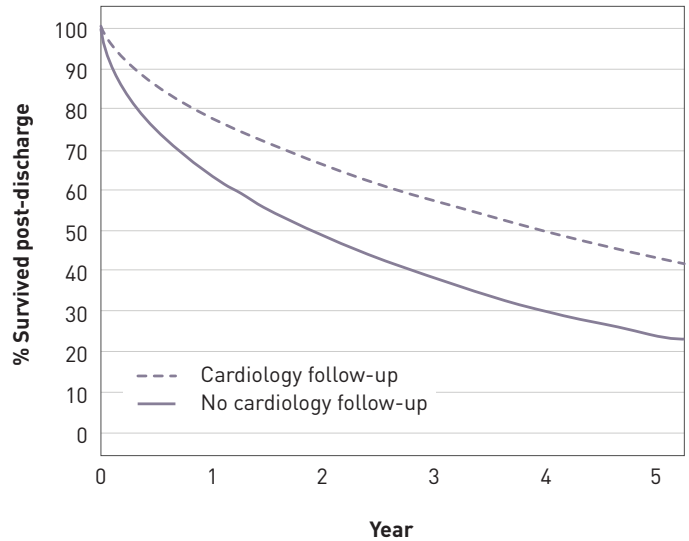
No. at risk						
ACEi inhibitor/ ARB	12680	8107	5245	3112	1412	233
ACEi inhibitor/ ARB and beta blocker	29736	19770	12420	7093	2996	520
ACEi inhibitor/ ARB, beta blocker and MRA	25883	16814	9897	5340	2230	304
No ACEi/ARB, beta blocker or MRA	8138	3920	2349	1255	501	90

Figure 18: Overall all cause mortality following discharge from hospital by place of in-hospital care (2009-14)



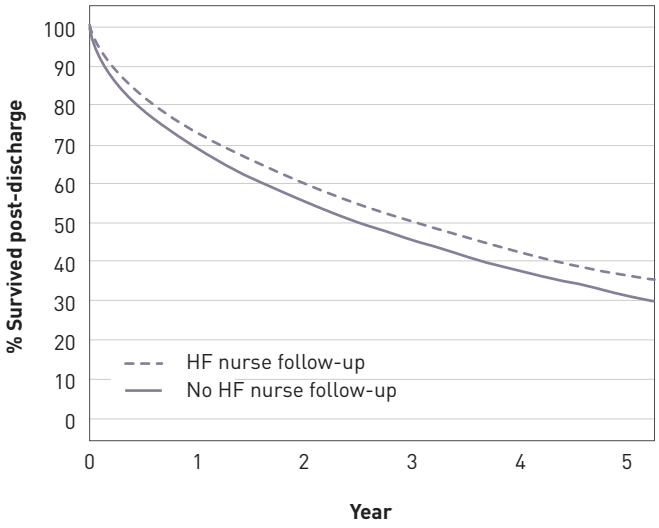
No. at risk						
Cardiology	62210	38840	23505	13113	5695	956
General Medicine	50370	28316	16250	8722	3498	516
Other	12678	6712	3828	2041	891	159

Figure 19: Overall all cause mortality following discharge from hospital by cardiology follow up (2009-14)



No. at risk						
No	55773	29553	16623	8540	3364	514
Yes	64794	41781	25523	14545	6349	1051

Figure 20: Overall all cause mortality following discharge from hospital by heart failure nurse follow up (2009-14)



No. at risk						
No	53449	30679	18258	10037	4166	652
Yes	66002	39785	23331	12638	5360	865

6 Hospital-level analysis

6.1 Participation and case ascertainment

Case ascertainment is measured against the number of emergency heart failure admissions with a primary discharge diagnosis of heart failure, as recorded by Hospital Episode Statistics (HES) in England and the Patient Episode Database of Wales (PEDW).

Case ascertainment is reported by Trust and Health Board, although the number of records submitted by each hospital is also included in this table. Trusts are counted as fully participating if they submitted at least 70% of their HES figures to the audit.

6.1.1 Participation and case ascertainment in England

Trust name	NHS Trust code	Trust records submitted	HES primary HF discharges	% HES submitted	Participation status	NICOR hospital code	Hospital name	Hospital records submitted
England and Wales		**54654**	**63941**	**85%**				
England		**51428**	**59820**	**86%**				
Aintree University Hospital NHS Foundation Trust	REM	467	394	119%	Yes	FAZ	University Hospital Aintree	467
Airedale NHS Foundation Trust	RCF	261	261	100%	Yes	AIR	Airedale General Hospital	261
Ashford and St Peter's Hospitals NHS Trust	RTK	432	334	129%	Yes	SPH	St Peter's Hospital	432
Barking, Havering and Redbridge University Hospitals NHS Trust	RF4	398	650	61%	No	KGG	King George Hospital	122
						OLD	Queen's Hospital Romford	276
Barnet and Chase Farm Hospitals NHS Trust	RVL	450	484	93%	Yes	BNT	Barnet General Hospital	418
						CHS	Chase Farm Hospital	32
Barnsley Hospital NHS Foundation Trust	RFF	254	328	77%	Yes	BAR	Barnsley Hospital	254
Barts Health NHS Trust	R1H	839	1040	81%	Yes	NWG	Newham University Hospital	305
						SBH	St Bartholomews Hospital	6
						LCH	The London Chest Hospital	29
						LON	The Royal Hospital London	155
						WHC	Whipps Cross University Hospital	344
Basildon and Thurrock University Hospitals NHS Foundation Trust	RDD	364	406	90%	Yes	BAS	Basildon University Hospital	364
Bedford Hospital NHS Trust	RC1	259	258	100%	Yes	BED	Bedford Hospital	259

Blackpool Teaching Hospitals NHS Foundation Trust	RXL	654	468	140%	Yes	VIC	Blackpool Victoria Hospital	654
Bolton NHS Foundation Trust	RMC	192	373	51%	No	BOL	Royal Bolton Hospital	192
Bradford Teaching Hospitals NHS Foundation Trust	RAE	411	492	84%	Yes	BRD	Bradford Royal Infirmary	411
Brighton and Sussex University Hospitals NHS Trust	RXH	690	543	127%	Yes	PRH	Princess Royal Hospital (Haywards Heath)	231
						RSC	Royal Sussex County Hospital	459
Buckinghamshire Healthcare NHS Trust	RXQ	386	283	136%	Yes	SMV	Stoke Mandeville Hospital	167
						AMG	Wycombe Hospital	219
Burton Hospitals NHS Foundation Trust	RJF	257	295	87%	Yes	BRT	Queen's Hospital (Burton)	257
Calderdale and Huddersfield NHS Foundation Trust	RWY	587	470	125%	Yes	RHI	Calderdale Royal Hospital	262
						HUD	Huddersfield Royal Infirmary	325
Cambridge University Hospitals NHS Foundation Trust	RGT	452	464	97%	Yes	ADD	Addenbrooke's Hospital	452
Central Manchester University Hospitals NHS Foundation Trust	RW3-X	298	379	79%	Yes	MRI	Manchester Royal Infirmary	298
						TRA	Trafford General Hospital	0
Chelsea and Westminster Hospital NHS Foundation Trust	RQM	127	141	90%	Yes	WES	Chelsea and Westminister Hospital	127
Chesterfield Royal Hospital NHS Foundation Trust	RFS	202	337	60%	No	CHE	Chesterfield Royal Hospital	202
City Hospitals Sunderland NHS Foundation Trust	RLN	476	369	129%	Yes	SUN	Sunderland Royal Hospital	476
Colchester Hospital University NHS Foundation Trust	RDE	503	496	101%	Yes	COL	Colchester General Hospital	503
Countess of Chester Hospital NHS Foundation Trust	RJR	393	268	147%	Yes	COC	Countess of Chester Hospital	393
County Durham and Darlington NHS Foundation Trust	RXP	583	558	104%	Yes	DAR	Darlington Memorial Hospital	267
						DRY	University Hospital of North Durham	316
Croydon Health Services NHS Trust	RJ6	356	323	110%	Yes	MAY	Croydon University Hospital	356
Dartford and Gravesham NHS Trust	RN7-X	359	171	210%	Yes	DVH	Darent Valley Hospital	359
Derby Hospitals NHS Foundation Trust	RTG	401	650	62%	No	DER	Royal Derby Hospital	401
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	RP5	334	495	67%	No	BSL	Bassetlaw Hospital	120
						DID	Doncaster Royal Infirmary	214
Dorset County Hospital NHS Foundation Trust	RBD	211	180	117%	Yes	WDH	Dorset County Hospital	211
Ealing Hospital NHS Trust	RC3	282	203	139%	Yes	EAL	Ealing Hospital	282
East and North Hertfordshire NHS Trust	RWH	321	293	110%	Yes	LIS	Lister Hospital	228
						QEW	Queen Elizabeth II Hospital	93

Trust name	NHS Trust code	Trust records submitted	HES primary HF discharges	% HES submitted	Participation status	NICOR hospital code	Hospital name	Hospital records submitted
East Cheshire NHS Trust	RJN	222	214	104%	Yes	MAC	Macclesfield District General Hospital	222
East Kent Hospitals University NHS Foundation Trust	RVV	623	776	80%	Yes	KCC	Kent and Canterbury Hospital	211
						QEQ	Queen Elizabeth the Queen Mother Hospital	182
						WHH	William Harvey Hospital	230
East Lancashire Hospitals NHS Trust	RXR	487	494	99%	Yes	BLA	Royal Blackburn Hospital	487
East Sussex Healthcare NHS Trust	RXC	458	512	89%	Yes	CGH	Conquest Hospital	222
Epsom and St Helier University Hospitals NHS Trust	RVR-X	405	378	107%	Yes	DGE	Eastbourne District General Hospital	236
						EPS	Epsom Hospital	177
						SHC	St Helier Hospital	228
Frimley Park Hospital NHS Foundation Trust	RDU	489	386	127%	Yes	FRM	Frimley Park Hospital	489
Gateshead Health NHS Foundation Trust	RR7-X	377	269	140%	Yes	QEG	Queen Elizabeth Hospital (Gateshead)	377
George Eliot Hospital NHS Trust	RLT	163	241	68%	No	NUN	George Eliot Hospital	163
Gloucestershire Hospitals NHS Foundation Trust	RTE	198	544	36%	No	CHG	Cheltenham General Hospital	76
						GLO	Gloucestershire Royal Hospital	122
Great Western Hospitals NHS Foundation Trust	RN3	498	381	131%	Yes	PMS	Great Western Hospital	498
Guy's and St Thomas' NHS Foundation Trust	RJ1-X	313	336	93%	Yes	STH	St Thomas' Hospital	313
Hampshire Hospitals NHS Foundation Trust	RN5-X	421	407	103%	Yes	NHH	Basingstoke and North Hampshire Hospital	259
						RHC	Royal Hampshire County Hospital	162
Harrogate and District NHS Foundation Trust	RCD	89	194	46%	No	HAR	Harrogate District Hospital	89
Heart of England NHS Foundation Trust	RR1-X	368	951	39%	No	EBH	Birmingham Heartlands Hospital	176
						GHS	Good Hope Hospital	53
						SOL	Solihull Hospital	139
Heatherwood and Wexham Park Hospitals NHS Foundation Trust	RD7	280	379	74%	Yes	WEX	Wexham Park Hospital	280
Hinchingbrooke Health Care NHS Trust	RQQ-X	16	167	10%	No	HIN	Hinchingbrooke Hospital	16
Homerton University Hospital NHS Foundation Trust	RQX	253	245	103%	Yes	HOM	Homerton University Hospital	253

Hull and East Yorkshire Hospitals NHS Trust	RWA	802	510	157%	Yes	CHH	Castle Hill Hospital	593
						HRI	Hull Royal Infirmary	209
Imperial College Healthcare NHS Trust	RYJ	455	697	65%	No	CCH	Charing Cross Hospital	85
						HAM	Hammersmith Hospital	283
						STM	St Mary's Hospital Paddington	87
Isle of Wight NHS PCT	R1F-X	217	243	89%	Yes	IOW	St Mary's Hospital, Newport	217
James Paget University Hospitals NHS Foundation Trust	RGP	327	337	97%	Yes	JPH	James Paget University Hospital	327
Kettering General Hospital NHS Foundation Trust	RNQ	376	453	83%	Yes	KGH	Kettering General Hospital	376
King's College Hospital NHS Foundation Trust*	RJZ	332	813	41%	No	KCH	King's College Hospital	332
						BRO	Princess Royal University Hospital (Bromley)	0
Kingston Hospital NHS Trust	RAX	177	325	54%	No	KTH	Kingston Hospital	177
Lancashire Teaching Hospitals NHS Foundation Trust	RXN	688	468	147%	Yes	CHO	Chorley and South Ribble Hospital	229
						RPH	Royal Preston Hospital	459
Leeds Teaching Hospitals NHS Trust	RR8	787	991	79%	Yes	LGI	Leeds General Infirmary	787
Lewisham Healthcare NHS trust/Lewisham and Greenwich NHS Trust†	RJ2	426	428	100%	Yes	GWH	Queen Elizabeth Hospital (Woolwich)	144
						UHL	University Hospital Lewisham	282
Liverpool Heart and Chest Hospital NHS Foundation Trust	RBQ	38	33	115%	Yes	BHL	Liverpool Heart and Chest Hospital	38
Luton and Dunstable Hospital NHS Foundation Trust	RC9	316	303	104%	Yes	LDH	Luton and Dunstable Hospital	316
Maidstone and Tunbridge Wells NHS Trust	RWF	382	424	90%	Yes	MAI	Maidstone Hospital	178
						KSX	Tunbridge Wells Hospital	204
Medway NHS Foundation Trust	RPA	167	286	58%	No	MDW	Medway Maritime Hospital	167
Mid Cheshire Hospitals NHS Foundation Trust	RBT	198	256	77%	Yes	LGH	Leighton Hospital	198
Mid Essex Hospital Services NHS Trust	RQ8	214	371	58%	No	BFH	Broomfield Hospital	214
Mid Staffordshire NHS Foundation Trust	RJD-X	134	235	57%	No	SDG	Stafford Hospital	134
Mid Yorkshire Hospitals NHS Trust	RXF-X	804	648	124%	Yes	DEW	Dewsbury and District Hospital	336
						PIN	Pinderfields Hospital	468

* BRO joined King's College Hospital NHS Foundation Trust after October 2013. We cannot vouch for the accuracy of the case ascertainment figures for this Trust due to these institutional changes.

† GWH combined with UHL to form Lewisham and Greenwich NHS Trust after October 2013. We cannot vouch for the accuracy of the case ascertainment figures for this Trust due to these institutional changes.

Trust name	NHS Trust code	Trust records submitted	HES primary HF discharges	% HES submitted	Participation status	NICOR hospital code	Hospital name	Hospital records submitted
Milton Keynes Hospital NHS Foundation Trust	RD8	329	282	117%	Yes	MKH	Milton Keynes General Hospital	329
Norfolk and Norwich University Hospitals NHS Foundation Trust	RM1	303	862	35%	No	NOR	Norfolk and Norwich University Hospital	303
North Bristol NHS Trust	RVJ-X	491	432	114%	Yes	FRY	Frenchay Hospital	258
						BSM	Southmead Hospital	233
North Cumbria University Hospitals NHS Trust	RNL	74	456	16%	No	CMI	Cumberland Infirmary	39
						WCI	West Cumberland Hospital	35
North Middlesex University Hospital NHS Trust	RAP	230	409	56%	No	NMH	North Middlesex University Hospital	230
North Tees and Hartlepool NHS Foundation Trust	RVW	427	324	132%	Yes	HGH	University Hospital of Hartlepool	78
						NTG	University Hospital of North Tees	349
Northampton General Hospital NHS Trust	RNS	298	337	88%	Yes	NTH	Northampton General Hospital	298
Northern Devon Healthcare NHS Trust	RBZ	270	220	123%	Yes	NDD	North Devon District Hospital	270
Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	RJL-X	417	505	83%	Yes	GGH	Diana Princess of Wales Hospital	195
						SCU	Scunthorpe General Hospital	222
Northumbria Healthcare NHS Foundation Trust	RTF	395	608	65%	No	HEX	Hexham General Hospital	33
						NTY	North Tyneside Hospital	215
						ASH	Wansbeck General Hospital	147
Nottingham University Hospitals NHS Trust	RX1	178	851	21%	No	CHN	Nottingham City Hospital	36
						UHN	Queen's Medical Centre	142
Oxford Radcliffe Hospitals NHS Trust	RTH	748	543	138%	Yes	HOR	Horton General Hospital	194
						RAD	John Radcliffe Hospital	554
Pennine Acute Hospitals NHS Trust	RW6	889	798	111%	Yes	BRY	Fairfield General Hospital	333
						NMG	North Manchester General Hospital	213
						BHH	Rochdale Infirmary	57
						OHM	Royal Oldham Hospital	286
Peterborough and Stamford Hospitals NHS Foundation Trust	RGN	422	425	99%	Yes	PET	Peterborough City Hospital	422
Plymouth Hospitals NHS Trust	RK9	321	491	65%	No	PLY	Derriford Hospital	321

Poole Hospital NHS Foundation Trust	RD3	256	230	111%	Yes	PGH	Poole General Hospital	256
Portsmouth Hospitals NHS Trust	RHU	398	535	74%	Yes	QAP	Queen Alexandra Hospital	398
Rotherham NHS Foundation Trust	RFR	300	308	97%	Yes	ROT	Rotherham Hospital	300
Royal Berkshire NHS Foundation Trust	RHW	407	446	91%	Yes	BHR	Royal Berkshire Hospital	407
Royal Brompton and Harefield NHS Foundation Trust	RT3	403	186	217%	Yes	HH	Harefield Hospital	199
						NHB	Royal Brompton Hospital	204
Royal Cornwall Hospitals NHS Trust	REF-X	295	409	72%	Yes	RCH	Royal Cornwall Hospital	295
Royal Devon and Exeter NHS Foundation Trust	RH8	375	308	122%	Yes	RDE	Royal Devon & Exeter Hospital	375
Royal Free London NHS Trust	RAL	273	340	80%	Yes	RFH	Royal Free Hospital	273
Royal Liverpool and Broadgreen University Hospitals NHS Trust	RQ6	339	273	124%	Yes	RLU	Royal Liverpool University Hospital	339
Royal Surrey County Hospital NHS Foundation Trust	RA2	209	189	111%	Yes	RSU	Royal Surrey County Hospital	209
Royal United Hospital Bath NHS Trust	RD1	172	399	43%	No	BAT	Royal United Hospital Bath	172
Salford Royal NHS Foundation Trust	RM3	378	267	142%	Yes	SLF	Salford Royal	378
Salisbury NHS Foundation Trust	RNZ	199	170	117%	Yes	SAL	Salisbury District Hospital	199
Sandwell and West Birmingham Hospitals NHS Trust	RXK-X	361	682	53%	No	DUD	Birmingham City Hospital	174
						SAN	Sandwell General Hospital	187
Sheffield Teaching Hospitals NHS Foundation Trust	RHQ	476	693	69%	No	NGS	Northern General Hospital	476
Sherwood Forest Hospitals NHS Foundation Trust	RK5	413	398	104%	Yes	KMH	King's Mill Hospital	407
						NHN	Newark Hospital	6
Shrewsbury and Telford Hospitals NHS Trust	RXW	127	532	24%	No	TLF	Princess Royal Hospital (Telford)	59
						RSS	Royal Shrewsbury Hospital	68
South Devon Healthcare NHS Foundation Trust	RA9	507	406	125%	Yes	TOR	Torbay Hospital	507
South London Healthcare NHS Trust‡	RYQ	177	139	127%	Yes	BRO	Princess Royal University Hospital (Bromley)	2
						GWH	Queen Elizabeth Hospital (Woolwich)	175
South Tees Hospitals NHS Foundation Trust	RTR	372	342	109%	Yes	FRH	Friarage Hospital	26
						SCM	James Cook University Hospital	346

‡ The South London Healthcare NHS Trust was dissolved after October 2013. We cannot vouch for the accuracy of the case ascertainment figures for this Trust due to these institutional changes.

Trust name	NHS Trust code	Trust records submitted	HES primary HF discharges	% HES submitted	Participation status	NICOR hospital code	Hospital name	Hospital records submitted
South Tyneside NHS Foundation Trust	RE9	256	121	212%	Yes	STD	South Tyneside District Hospital	256
South Warwickshire NHS Foundation Trust	RJC	213	185	115%	Yes	WAR	Warwick Hospital	213
Southend University Hospital NHS Foundation Trust	RAJ	525	492	107%	Yes	SEH	Southend Hospital	525
Southport and Ormskirk Hospital NHS Trust	RVY	264	230	115%	Yes	SOU	Southport and Formby District General Hospital	264
St George's Healthcare NHS Trust	RJ7	516	528	98%	Yes	GEO	St George's Hospital	516
St Helens and Knowsley Teaching Hospitals NHS Trust	RBN	270	287	94%	Yes	WHI	Whiston Hospital	270
Stockport NHS Foundation Trust	RWJ	333	355	94%	Yes	SHH	Stepping Hill Hospital	333
Surrey and Sussex Healthcare NHS Trust	RTP	216	384	56%	No	ESU	East Surrey Hospital	216
Tameside Hospital NHS Foundation Trust	RMP	261	305	86%	Yes	TGA	Tameside General Hospital	261
Taunton and Somerset NHS Foundation Trust	RBA	291	320	91%	Yes	MPH	Musgrove Park Hospital	291
The Dudley Group NHS Foundation Trust	RNA	390	364	107%	Yes	RUS	Russells Hall Hospital	390
The Hillingdon Hospitals NHS Foundation Trust	RAS	191	248	77%	Yes	HIL	Hillingdon Hospital	191
The Ipswich Hospital NHS Trust	RGQ	170	438	39%	No	IPS	Ipswich Hospital	170
The Newcastle Upon Tyne Hospitals NHS Foundation Trust	RTD	496	425	117%	Yes	FRE	Freeman Hospital and Royal Victoria Infirmary	496
The North West London Hospitals NHS Trust	RV8	288	612	47%	No	CMH	Central Middlesex Hospital	94
						NPH	Northwick Park Hospital	194
The Princess Alexandra Hospital NHS Trust	RQW	127	301	42%	No	PAH	Princess Alexandra Hospital	127
The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust	RCX	289	386	75%	Yes	QKL	Queen Elizabeth Hospital (King's Lynn)	289
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	RDZ	455	457	100%	Yes	BOU	Royal Bournemouth General Hospital	455
The Royal Wolverhampton Hospitals NHS Trust	RL4	141	543	26%	No	NCR	New Cross Hospital	141
The Whittington Hospital NHS Trust	RKE	160	245	65%	No	WHT	Whittington Hospital	160
United Lincolnshire Hospitals NHS Trust	RWD	412	757	54%	No	GRA	Grantham and District Hospital	96
						LIN	Lincoln County Hospital	123
						PIL	Pilgrim Hospital	193

University College London Hospitals NHS Foundation Trust	RRV	333	242	138%	Yes	UCL	University College Hospital	333
University Hospital of North Staffordshire NHS Trust	RJE	731	801	91%	Yes	STO	University Hospital of North Staffordshire	731
University Hospital of South Manchester NHS Foundation Trust	RM2	240	339	71%	Yes	WYT	Wythenshawe Hospital	240
University Hospital Southampton NHS Trust	RHM	327	475	69%	No	SGH	Southampton General Hospital	327
University Hospitals Birmingham NHS Foundation Trust	RRK-X	421	612	69%	No	QEB	Queen Elizabeth Hospital (Edgbaston)	421
University Hospitals Bristol NHS Foundation Trust	RA7	351	281	125%	Yes	BRI	Bristol Royal Infirmary	351
University Hospitals Coventry and Warwickshire NHS Trust	RKB	453	590	77%	Yes	WAL	University Hospital Coventry	453
University Hospitals of Leicester NHS Trust	RWE	839	1191	70%	Yes	GRL	Glenfield Hospital	709
						LER	Leicester Royal Infirmary	130
University Hospitals of Morecambe Bay NHS Foundation Trust	RTX	343	352	97%	Yes	FGH	Furness General Hospital	158
						RLI	Royal Lancaster Infirmary	185
Walsall Healthcare NHS Trust	RBK	251	453	55%	No	WMH	Manor Hospital	251
Warrington and Halton Hospitals NHS Foundation Trust	RWW	98	297	33%	No	WDG	Warrington Hospital	98
West Hertfordshire Hospitals NHS Trust	RWG	587	469	125%	Yes	WAT	Watford General Hospital	587
West Middlesex University Hospital NHS Trust	RFW	251	211	119%	Yes	WMU	West Middlesex University Hospital	251
West Suffolk NHS Foundation Trust	RGR	305	291	105%	Yes	WSH	West Suffolk Hospital	305
Western Sussex Hospitals NHS Trust	RYR-X	684	732	93%	Yes	STR	St Richard's Hospital	307
						WRG	Worthing Hospital	377
Weston Area Health NHS Trust	RA3	125	228	55%	No	WGH	Weston General Hospital	125
Wirral University Teaching Hospital NHS Foundation Trust	RBL	405	460	88%	Yes	WIR	Arrowe Park Hospital	405
Worcestershire Acute Hospitals NHS Trust	RWP-X	275	604	46%	No	RED	Alexandra Hospital	196
						WRC	Worcestershire Royal Hospital	79
Wrightington, Wigan and Leigh NHS Foundation Trust	RRF	501	303	165%	Yes	AEI	Royal Albert Edward Infirmary	501
Wye Valley NHS Trust	RLQ	187	208	90%	Yes	HCH	County Hospital Hereford	187
Yeovil District Hospital NHS Foundation Trust	RA4	195	175	111%	Yes	YEO	Yeovil District Hospital	195
York Teaching Hospital NHS Foundation Trust	RCB	334	627	53%	No	YDH	The York Hospital	334
						SCA	Scarborough General Hospital	0

6.1.2 Participation and case ascertainment in Wales

Health Board name	Health Board records submitted	PEDW primary HF discharges	% PEDW submitted	Participation status	NICOR hospital code	Hospital name	Hospital records submitted
England and Wales	**54654**	**63802**	**86%**				**54654**
Wales	**3226**	**4121**	**78%**				**3226**
Abertawe Bro Morgannwg University Health Board	696	806	86%	Yes	MOR	Morriston Hospital	287
					POW	Princess Of Wales Hospital	261
					SIN	Singleton Hospital	148
Aneurin Bevan Health Board	441	891	49%	No	NEV	Nevill Hall Hospital	240
					GWE	Royal Gwent Hospital	201
					YYF	Ysbyty Ystrad Fawr	0
Betsi Cadwaladr University Health Board	678	801	85%	Yes	CLW	Glan Clwyd Hospital	296
					WRX	Wrexham Maelor Hospital	225
					GWY	Ysbyty Gwynedd Hospital	157
Cardiff & Vale University Health Board	427	522	82%	Yes	LLD	University Hospital Llandough	169
					UHW	University Hospital of Wales	258
Cwm Taf Health Board	423	485	87%	Yes	PCH	Prince Charles Hospital	272
					GWE	Royal Glamorgan Hospital	151
Hywel Dda Health Board	561	616	91%	Yes	BRG	Bronglais General Hospital	191
					WWG	Glangwili General Hospital	86
					PPH	Prince Philip Hospital	139
					WYB	Withybush General Hospital	145

6.2 Clinical practice analysis

6.2.1 In-hospital care in England

* indicates that small numbers (n<50, where case ascertainment is <70% or where n<10) have been suppressed.

Trust name	NICOR hospital code	Hospital name	Heart failure admissions (n)	Received echo (%)	Cardiology inpatient (%)	Input from consultant cardiologist (%)	Input from specialist (%)
England and Wales			**49798**	**92%**	**49%**	**60%**	**78%**
Aintree University Hospital NHS Foundation Trust	FAZ	University Hospital Aintree	458	99%	76%	81%	92%
Airedale NHS Foundation Trust	AIR	Airedale General Hospital	233	90%	29%	35%	44%
Ashford and St Peter's Hospitals NHS Trust	SPH	St Peter's Hospital	414	81%	49%	53%	79%
Barking, Havering and Redbridge University Hospitals NHS Trust	KGG	King George Hospital	102	99%	40%	73%	95%
Barking, Havering and Redbridge University Hospitals NHS Trust	OLD	Queen's Hospital Romford	252	100%	29%	31%	70%
Barnet and Chase Farm Hospitals NHS Trust	BNT	Barnet General Hospital	415	97%	67%	75%	83%
Barnet and Chase Farm Hospitals NHS Trust	CHS	Chase Farm Hospital	32	97%	41%	44%	66%
Barnsley Hospital NHS Foundation Trust	BAR	Barnsley Hospital	207	98%	34%	43%	71%
Barts Health NHS Trust	NWG	Newham University Hospital	303	86%	85%	91%	91%
Barts Health NHS Trust	SBH	St Bartholomews Hospital	6	100%	100%	100%	100%
Barts Health NHS Trust	LCH	The London Chest Hospital	27	100%	96%	96%	96%
Barts Health NHS Trust	LON	The Royal Hospital London	125	100%	50%	49%	62%
Barts Health NHS Trust	WHC	Whipps Cross University Hospital	265	100%	30%	45%	70%
Basildon and Thurrock University Hospitals NHS Foundation Trust	BAS	Basildon University Hospital	293	100%	96%	90%	99%
Bedford Hospital NHS Trust	BED	Bedford Hospital	257	97%	55%	62%	69%
Blackpool Teaching Hospitals NHS Foundation Trust	VIC	Blackpool Victoria Hospital	585	100%	59%	63%	98%
Bolton NHS Foundation Trust	BOL	Royal Bolton Hospital	189	96%	68%	84%	85%
Bradford Teaching Hospitals NHS Foundation Trust	BRD	Bradford Royal Infirmary	410	92%	42%	43%	78%
Brighton and Sussex University Hospitals NHS Trust	PRH	Princess Royal Hospital (Haywards Heath)	231	81%	8%	46%	69%
Brighton and Sussex University Hospitals NHS Trust	RSC	Royal Sussex County Hospital	458	86%	50%	54%	56%

Trust name	NICOR hospital code	Hospital name	Heart failure admissions (n)	Received echo (%)	Cardiology inpatient (%)	Input from consultant cardiologist (%)	Input from specialist (%)
Buckinghamshire Healthcare NHS Trust	SMV	Stoke Mandeville Hospital	114	100%	0%	11%	60%
Buckinghamshire Healthcare NHS Trust	AMG	Wycombe Hospital	201	99%	96%	95%	97%
Burton Hospitals NHS Foundation Trust	BRT	Queen's Hospital (Burton)	253	71%	55%	57%	58%
Calderdale and Huddersfield NHS Foundation Trust	RHI	Calderdale Royal Hospital	219	96%	66%	68%	70%
Calderdale and Huddersfield NHS Foundation Trust	HUD	Huddersfield Royal Infirmary	250	95%	42%	50%	55%
Cambridge University Hospitals NHS Foundation Trust	ADD	Addenbrooke's Hospital	449	84%	22%	20%	47%
Central Manchester University Hospitals NHS Foundation Trust	MRI	Manchester Royal Infirmary	287	92%	48%	53%	74%
Central Manchester University Hospitals NHS Foundation Trust	TRA	Trafford General Hospital	0	n/a	n/a	n/a	n/a
Chelsea and Westminster Hospital NHS Foundation Trust	WES	Chelsea and Westminister Hospital	119	100%	4%	80%	100%
Chesterfield Royal Hospital NHS Foundation Trust	CHE	Chesterfield Royal Hospital	202	77%	27%	37%	46%
City Hospitals Sunderland NHS Foundation Trust	SUN	Sunderland Royal Hospital	212	97%	28%	52%	98%
Colchester Hospital University NHS Foundation Trust	COL	Colchester General Hospital	495	100%	52%	76%	99%
Countess of Chester Hospital NHS Foundation Trust	COC	Countess of Chester Hospital	387	99%	61%	100%	100%
County Durham and Darlington NHS Foundation Trust	DAR	Darlington Memorial Hospital	240	97%	49%	64%	100%
County Durham and Darlington NHS Foundation Trust	DRY	University Hospital of North Durham	314	97%	50%	54%	54%
Croydon Health Services NHS Trust	MAY	Croydon University Hospital	269	99%	62%	61%	79%
Dartford and Gravesham NHS Trust	DVH	Darent Valley Hospital	342	93%	50%	75%	95%
Derby Hospitals NHS Foundation Trust	DER	Royal Derby Hospital	401	96%	91%	95%	100%
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	BSL	Bassetlaw Hospital	106	94%	35%	42%	93%
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	DID	Doncaster Royal Infirmary	170	99%	26%	47%	50%
Dorset County Hospital NHS Foundation Trust	WDH	Dorset County Hospital	208	91%	26%	44%	51%
Ealing Hospital NHS Trust	EAL	Ealing Hospital	281	99%	42%	92%	94%
East and North Hertfordshire NHS Trust	LIS	Lister Hospital	180	97%	62%	81%	96%
East and North Hertfordshire NHS Trust	QEW	Queen Elizabeth II Hospital	90	91%	0%	19%	47%
East Cheshire NHS Trust	MAC	Macclesfield District General Hospital	207	96%	63%	69%	82%

East Kent Hospitals University NHS Foundation Trust	KCC	Kent and Canterbury Hospital	175	88%	25%	31%	84%
East Kent Hospitals University NHS Foundation Trust	QEQ	Queen Elizabeth the Queen Mother Hospital	157	77%	29%	33%	80%
East Kent Hospitals University NHS Foundation Trust	WHH	William Harvey Hospital	189	82%	43%	41%	87%
East Lancashire Hospitals NHS Trust	BLA	Royal Blackburn Hospital	461	65%	31%	50%	88%
East Sussex Healthcare NHS Trust	CGH	Conquest Hospital	193	99%	23%	24%	73%
East Sussex Healthcare NHS Trust	DGE	Eastbourne District General Hospital	222	98%	44%	44%	92%
Epsom and St Helier University Hospitals NHS Trust	EPS	Epsom Hospital	176	79%	36%	51%	66%
Epsom and St Helier University Hospitals NHS Trust	SHC	St Helier Hospital	226	83%	29%	41%	72%
Frimley Park Hospital NHS Foundation Trust	FRM	Frimley Park Hospital	353	95%	54%	60%	71%
Gateshead Health NHS Foundation Trust	QEG	Queen Elizabeth Hospital (Gateshead)	347	100%	56%	94%	97%
George Eliot Hospital NHS Trust	NUN	George Eliot Hospital	118	99%	40%	75%	79%
Gloucestershire Hospitals NHS Foundation Trust	CHG	Cheltenham General Hospital	50	74%	28%	30%	30%
Gloucestershire Hospitals NHS Foundation Trust	GLO	Gloucestershire Royal Hospital	78	94%	50%	53%	53%
Great Western Hospitals NHS Foundation Trust	PMS	Great Western Hospital	498	93%	44%	51%	67%
Guy's and St Thomas' NHS Foundation Trust	STH	St Thomas' Hospital	307	100%	56%	82%	98%
Hampshire Hospitals NHS Foundation Trust	NHH	Basingstoke and North Hampshire Hospital	217	100%	33%	67%	73%
Hampshire Hospitals NHS Foundation Trust	RHC	Royal Hampshire County Hospital	150	97%	68%	84%	85%
Harrogate and District NHS Foundation Trust	HAR	Harrogate District Hospital	82	65%	39%	45%	52%
Heart of England NHS Foundation Trust	EBH	Birmingham Heartlands Hospital	174	98%	49%	54%	84%
Heart of England NHS Foundation Trust	GHS	Good Hope Hospital	49	100%	88%	88%	94%
Heart of England NHS Foundation Trust	SOL	Solihull Hospital	139	99%	76%	76%	91%
Heatherwood and Wexham Park Hospitals NHS Foundation Trust	WEX	Wexham Park Hospital	262	86%	28%	62%	71%
Hinchingbrooke Health Care NHS Trust	HIN	Hinchingbrooke Hospital	14	100%	7%	79%	100%
Homerton University Hospital NHS Foundation Trust	HOM	Homerton University Hospital	249	94%	35%	38%	46%
Hull and East Yorkshire Hospitals NHS Trust	CHH	Castle Hill Hospital	495	100%	77%	79%	95%
Hull and East Yorkshire Hospitals NHS Trust	HRI	Hull Royal Infirmary	121	99%	4%	3%	83%
Imperial College Healthcare NHS Trust	CCH	Charing Cross Hospital	85	95%	28%	96%	100%
Imperial College Healthcare NHS Trust	HAM	Hammersmith Hospital	283	76%	33%	72%	91%

Trust name	NICOR hospital code	Hospital name	Heart failure admissions (n)	Received echo (%)	Cardiology inpatient (%)	Input from consultant cardiologist (%)	Input from specialist (%)
Imperial College Healthcare NHS Trust	STM	St Mary's Hospital Paddington	85	100%	24%	55%	92%
Isle of Wight NHS PCT	IOW	St Mary's Hospital, Newport	188	87%	40%	43%	45%
James Paget University Hospitals NHS Foundation Trust	JPH	James Paget University Hospital	302	99%	75%	85%	96%
Kettering General Hospital NHS Foundation Trust	KGH	Kettering General Hospital	338	96%	70%	76%	99%
King's College Hospital NHS Foundation Trust	KCH	King's College Hospital	331	100%	28%	86%	91%
King's College Hospital NHS Foundation Trust	BRO	Princess Royal University Hospital (Bromley)	1	0%	0%	0%	0%
Kingston Hospital NHS Trust	KTH	Kingston Hospital	177	87%	44%	52%	53%
Lancashire Teaching Hospitals NHS Foundation Trust	CHO	Chorley and South Ribble Hospital	229	100%	38%	68%	100%
Lancashire Teaching Hospitals NHS Foundation Trust	RPH	Royal Preston Hospital	456	99%	49%	47%	99%
Leeds Teaching Hospitals NHS Trust	LGI	Leeds General Infirmary	697	96%	71%	77%	82%
Lewisham and Greenwich NHS Trust	GWH	Queen Elizabeth Hospital (Woolwich)	295	100%	54%	64%	77%
Lewisham and Greenwich NHS Trust	LEW	University Hospital Lewisham	253	100%	24%	48%	63%
Liverpool Heart and Chest Hospital NHS Foundation Trust	BHL	Liverpool Heart and Chest Hospital	35	100%	97%	100%	100%
Luton and Dunstable Hospital NHS Foundation Trust	LDH	Luton and Dunstable Hospital	244	100%	23%	48%	62%
Maidstone and Tunbridge Wells NHS Trust	MAI	Maidstone Hospital	171	98%	54%	71%	100%
Maidstone and Tunbridge Wells NHS Trust	KSX	Tunbridge Wells Hospital	191	99%	69%	81%	94%
Medway NHS Foundation Trust	MDW	Medway Maritime Hospital	163	98%	38%	46%	98%
Mid Cheshire Hospitals NHS Foundation Trust	LGH	Leighton Hospital	197	100%	80%	87%	96%
Mid Essex Hospital Services NHS Trust	BFH	Broomfield Hospital	209	100%	40%	73%	75%
Mid Staffordshire NHS Foundation Trust	SDG	Stafford Hospital	134	78%	43%	46%	46%
Mid Yorkshire Hospitals NHS Trust	DEW	Dewsbury and District Hospital	312	82%	11%	28%	44%
Mid Yorkshire Hospitals NHS Trust	PIN	Pinderfields Hospital	382	98%	38%	43%	63%
Milton Keynes Hospital NHS Foundation Trust	MKH	Milton Keynes General Hospital	306	99%	55%	85%	91%
Norfolk and Norwich University Hospitals NHS Foundation Trust	NOR	Norfolk and Norwich University Hospital	303	74%	100%	100%	100%
North Bristol NHS Trust	FRY	Frenchay Hospital	257	67%	35%	41%	47%
North Bristol NHS Trust	BSM	Southmead Hospital	230	83%	62%	69%	74%

North Cumbria University Hospitals NHS Trust	CMI	Cumberland Infirmary	33	100%	36%	12%	100%
North Cumbria University Hospitals NHS Trust	WCI	West Cumberland Hospital	31	100%	19%	7%	100%
North Middlesex University Hospital NHS Trust	NMH	North Middlesex University Hospital	205	85%	6%	32%	69%
North Tees and Hartlepool NHS Foundation Trust	HGH	University Hospital of Hartlepool	71	99%	61%	49%	49%
North Tees and Hartlepool NHS Foundation Trust	NTG	University Hospital of North Tees	253	100%	43%	53%	56%
Northampton General Hospital NHS Trust	NTH	Northampton General Hospital	290	82%	53%	67%	89%
Northern Devon Healthcare NHS Trust	NDD	North Devon District Hospital	270	91%	52%	61%	65%
Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	GGH	Diana Princess of Wales Hospital	160	98%	70%	79%	84%
Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	SCU	Scunthorpe General Hospital	202	97%	31%	22%	37%
Northumbria Healthcare NHS Foundation Trust	HEX	Hexham General Hospital	24	100%	0%	4%	9%
Northumbria Healthcare NHS Foundation Trust	NTY	North Tyneside Hospital	173	98%	65%	71%	73%
Northumbria Healthcare NHS Foundation Trust	ASH	Wansbeck General Hospital	131	100%	57%	60%	63%
Nottingham University Hospitals NHS Trust	CHN	Nottingham City Hospital	33	84%	76%	82%	85%
Nottingham University Hospitals NHS Trust	UHN	Queen's Medical Centre	100	88%	14%	35%	44%
Oxford Radcliffe Hospitals NHS Trust	HOR	Horton General Hospital	186	92%	27%	51%	86%
Oxford Radcliffe Hospitals NHS Trust	RAD	John Radcliffe Hospital	500	89%	23%	64%	86%
Pennine Acute Hospitals NHS Trust	BRY	Fairfield General Hospital	325	71%	28%	23%	45%
Pennine Acute Hospitals NHS Trust	NMG	North Manchester General Hospital	203	79%	36%	46%	73%
Pennine Acute Hospitals NHS Trust	BHH	Rochdale Infirmary	48	64%	77%	9%	15%
Pennine Acute Hospitals NHS Trust	OHM	Royal Oldham Hospital	274	82%	34%	48%	71%
Peterborough and Stamford Hospitals NHS Foundation Trust	PET	Peterborough City Hospital	381	92%	62%	60%	80%
Plymouth Hospitals NHS Trust	PLY	Derriford Hospital	297	100%	38%	0%	100%
Poole Hospital NHS Foundation Trust	PGH	Poole General Hospital	252	70%	20%	34%	74%
Portsmouth Hospitals NHS Trust	QAP	Queen Alexandra Hospital	389	98%	76%	90%	98%
Rotherham NHS Foundation Trust	ROT	Rotherham Hospital	279	93%	36%	57%	93%
Royal Berkshire NHS Foundation Trust	BHR	Royal Berkshire Hospital	354	100%	54%	77%	86%
Royal Brompton and Harefield NHS Foundation Trust	HH	Harefield Hospital	194	98%	58%	89%	98%
Royal Brompton and Harefield NHS Foundation Trust	NHB	Royal Brompton Hospital	202	100%	95%	96%	99%

Trust name	NICOR hospital code	Hospital name	Heart failure admissions (n)	Received echo (%)	Cardiology inpatient (%)	Input from consultant cardiologist (%)	Input from specialist (%)
Royal Cornwall Hospitals NHS Trust	RCH	Royal Cornwall Hospital	195	98%	46%	55%	64%
Royal Devon and Exeter NHS Foundation Trust	RDE	Royal Devon & Exeter Hospital	349	67%	36%	48%	48%
Royal Free London NHS Trust	RFH	Royal Free Hospital	251	100%	41%	48%	62%
Royal Liverpool and Broadgreen University Hospitals NHS Trust	RLU	Royal Liverpool University Hospital	333	97%	65%	71%	89%
Royal Surrey County Hospital NHS Foundation Trust	RSU	Royal Surrey County Hospital	199	86%	54%	64%	79%
Royal United Hospital Bath NHS Trust	BAT	Royal United Hospital Bath	170	95%	72%	75%	97%
Salford Royal NHS Foundation Trust	SLF	Salford Royal	341	77%	44%	41%	83%
Salisbury NHS Foundation Trust	SAL	Salisbury District Hospital	199	85%	63%	70%	83%
Sandwell and West Birmingham Hospitals NHS Trust	DUD	Birmingham City Hospital	163	100%	62%	94%	95%
Sandwell and West Birmingham Hospitals NHS Trust	SAN	Sandwell General Hospital	182	99%	47%	95%	98%
Sheffield Teaching Hospitals NHS Foundation Trust	NGS	Northern General Hospital	465	98%	29%	56%	98%
Sherwood Forest Hospitals NHS Foundation Trust	KMH	King's Mill Hospital	403	75%	46%	63%	66%
Sherwood Forest Hospitals NHS Foundation Trust	NHN	Newark Hospital	6	0%	0%	0%	50%
Shrewsbury and Telford Hospitals NHS Trust	TLF	Princess Royal Hospital (Telford)	59	100%	61%	70%	100%
Shrewsbury and Telford Hospitals NHS Trust	RSS	Royal Shrewsbury Hospital	68	100%	53%	63%	100%
South Devon Healthcare NHS Foundation Trust	TOR	Torbay Hospital	507	74%	42%	48%	87%
South Tees Hospitals NHS Foundation Trust	FRH	Friarage Hospital	26	100%	0%	92%	100%
South Tees Hospitals NHS Foundation Trust	SCM	James Cook University Hospital	338	100%	79%	84%	98%
South Tyneside NHS Foundation Trust	STD	South Tyneside District Hospital	237	99%	61%	68%	95%
South Warwickshire NHS Foundation Trust	WAR	Warwick Hospital	181	92%	67%	78%	86%
Southend University Hospital NHS Foundation Trust	SEH	Southend Hospital	359	98%	57%	63%	70%
Southport and Ormskirk Hospital NHS Trust	SOU	Southport and Formby District General Hospital	262	95%	48%	63%	77%
St George's Healthcare NHS Trust	GEO	St George's Hospital	446	99%	38%	58%	88%
St Helens and Knowsley Teaching Hospitals NHS Trust	WHI	Whiston Hospital	270	99%	77%	91%	92%
Stockport NHS Foundation Trust	SHH	Stepping Hill Hospital	330	92%	28%	28%	76%

Surrey and Sussex Healthcare NHS Trust	ESU	East Surrey Hospital	214	81%	63%	73%	73%
Tameside Hospital NHS Foundation Trust	TGA	Tameside General Hospital	260	82%	43%	47%	59%
Taunton and Somerset NHS Foundation Trust	MPH	Musgrove Park Hospital	291	75%	43%	49%	83%
The Dudley Group NHS Foundation Trust	RUS	Russells Hall Hospital	351	99%	56%	53%	68%
The Hillingdon Hospitals NHS Foundation Trust	HIL	Hillingdon Hospital	186	89%	47%	60%	70%
The Ipswich Hospital NHS Trust	IPS	Ipswich Hospital	164	57%	23%	29%	36%
The Newcastle Upon Tyne Hospitals NHS Foundation Trust	FRE	Freeman Hospital and Royal Victoria Infirmary	489	90%	66%	76%	92%
The North West London Hospitals NHS Trust	CMH	Central Middlesex Hospital	93	80%	22%	23%	28%
The North West London Hospitals NHS Trust	NPH	Northwick Park Hospital	194	73%	37%	38%	39%
The Princess Alexandra Hospital NHS Trust	PAH	Princess Alexandra Hospital	118	93%	42%	47%	60%
The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust	QKL	Queen Elizabeth Hospital (King's Lynn)	213	83%	38%	39%	83%
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	BOU	Royal Bournemouth General Hospital	453	67%	50%	52%	80%
The Royal Wolverhampton Hospitals NHS Trust	NCR	New Cross Hospital	69	97%	22%	25%	69%
The Whittington Hospital NHS Trust	WHT	Whittington Hospital	160	98%	63%	83%	84%
United Lincolnshire Hospitals NHS Trust	GRA	Grantham and District Hospital	96	87%	64%	84%	84%
United Lincolnshire Hospitals NHS Trust	LIN	Lincoln County Hospital	121	76%	47%	66%	72%
United Lincolnshire Hospitals NHS Trust	PIL	Pilgrim Hospital	191	84%	44%	71%	74%
University College London Hospitals NHS Foundation Trust	UCL	University College Hospital	323	100%	52%	79%	98%
University Hospital of North Staffordshire NHS Trust	STO	University Hospital of North Staffordshire	676	81%	40%	39%	74%
University Hospital of South Manchester NHS Foundation Trust	WYT	Wythenshawe Hospital	235	82%	39%	49%	64%
University Hospital Southampton NHS Trust	SGH	Southampton General Hospital	324	100%	43%	42%	100%
University Hospitals Birmingham NHS Foundation Trust	QEB	Queen Elizabeth Hospital (Edgbaston)	297	90%	31%	65%	70%
University Hospitals Bristol NHS Foundation Trust	BRI	Bristol Royal Infirmary	347	100%	98%	99%	100%
University Hospitals Coventry and Warwickshire NHS Trust	WAL	University Hospital Coventry	390	99%	68%	62%	82%
University Hospitals of Leicester NHS Trust	GRL	Glenfield Hospital	669	98%	89%	86%	89%
University Hospitals of Leicester NHS Trust	LER	Leicester Royal Infirmary	96	84%	0%	0%	2%

Trust name	NICOR hospital code	Hospital name	Heart failure admissions (n)	Received echo (%)	Cardiology inpatient (%)	Input from consultant cardiologist (%)	Input from specialist (%)
University Hospitals of Morecambe Bay NHS Foundation Trust	FGH	Furness General Hospital	158	99%	32%	63%	96%
University Hospitals of Morecambe Bay NHS Foundation Trust	RLI	Royal Lancaster Infirmary	175	99%	13%	94%	100%
Walsall Healthcare NHS Trust	WMH	Manor Hospital	250	100%	44%	78%	100%
Warrington and Halton Hospitals NHS Foundation Trust	WDG	Warrington Hospital	95	100%	67%	75%	97%
West Hertfordshire Hospitals NHS Trust	WAT	Watford General Hospital	579	84%	43%	51%	98%
West Middlesex University Hospital NHS Trust	WMU	West Middlesex University Hospital	225	90%	25%	34%	91%
West Suffolk NHS Foundation Trust	WSH	West Suffolk Hospital	283	91%	56%	39%	60%
Western Sussex Hospitals NHS Trust	STR	St Richard's Hospital	300	93%	61%	69%	71%
Western Sussex Hospitals NHS Trust	WRG	Worthing Hospital	325	88%	40%	42%	82%
Weston Area Health NHS Trust	WGH	Weston General Hospital	69	100%	21%	25%	25%
Wirral University Teaching Hospital NHS Foundation Trust	WIR	Arrowe Park Hospital	403	94%	56%	64%	78%
Worcestershire Acute Hospitals NHS Trust	RED	Alexandra Hospital	192	93%	21%	67%	67%
Worcestershire Acute Hospitals NHS Trust	WRC	Worcestershire Royal Hospital	78	100%	73%	82%	99%
Wrightington, Wigan and Leigh NHS Foundation Trust	AEI	Royal Albert Edward Infirmary	437	98%	74%	84%	99%
Wye Valley NHS Trust	HCH	County Hospital Hereford	144	99%	52%	54%	54%
Yeovil District Hospital NHS Foundation Trust	YEO	Yeovil District Hospital	183	99%	74%	88%	97%
York Teaching Hospital NHS Foundation Trust	SCA	Scarborough General Hospital	0	n/a	n/a	n/a	n/a
York Teaching Hospital NHS Foundation Trust	YDH	The York Hospital	293	89%	25%	42%	49%

6.2.2 Treatment and management on discharge in England

Trust name	NICOR hospital code	Hospital name	Heart failure admissions (n)	ACEI on discharge (%)	ACEI/ ARB on discharge (%)	Beta blocker on discharge (%)	MRA on discharge (%)	Received discharge planning (%)	Referral to HF nurse follow-up (%)	Referral to HF nurse follow-up (LVSD only) (%)	Referral to cardiology follow-up (%)	Referral to cardiac rehabilitation (%)
England and Wales			**49798**	**72%**	**85%**	**85%**	**52%**	**86%**	**59%**	**69%**	**54%**	**10%**
Aintree University Hospital NHS Foundation Trust	FAZ	University Hospital Aintree	458	92%	97%	97%	48%	86%	82%	88%	77%	3%
Airedale NHS Foundation Trust	AIR	Airedale General Hospital	233	88%	93%	88%	64%	93%	17%	21%	22%	3%
Ashford and St Peter's Hospitals NHS Trust	SPH	St Peter's Hospital	414	99%	99%	100%	100%	92%	41%	56%	59%	21%
Barking, Havering and Redbridge University Hospitals NHS Trust	KGG	King George Hospital	102	49%	77%	76%	61%	75%	59%	77%	61%	10%
Barking, Havering and Redbridge University Hospitals NHS Trust	OLD	Queen's Hospital Romford	252	72%	83%	82%	62%	77%	72%	83%	64%	54%
Barnet and Chase Farm Hospitals NHS Trust	BNT	Barnet General Hospital	415	79%	93%	87%	62%	91%	59%	66%	78%	17%
Barnet and Chase Farm Hospitals NHS Trust	CHS	Chase Farm Hospital	32	88%	88%	100%	69%	100%	90%	94%	74%	14%
Barnsley Hospital NHS Foundation Trust	BAR	Barnsley Hospital	207	64%	81%	80%	46%	89%	44%	48%	63%	2%
Barts Health NHS Trust	NWG	Newham University Hospital	303	43%	55%	76%	33%	95%	68%	77%	75%	23%
Barts Health NHS Trust	SBH	St Bartholomews Hospital	6	60%	100%	100%	60%	100%	100%	100%	100%	0%
Barts Health NHS Trust	LCH	The London Chest Hospital	27	71%	76%	95%	67%	94%	81%	93%	92%	8%
Barts Health NHS Trust	LON	The Royal Hospital London	125	57%	63%	85%	40%	92%	72%	84%	76%	8%
Barts Health NHS Trust	WHC	Whipps Cross University Hospital	265	67%	83%	74%	43%	80%	69%	73%	39%	2%

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Basildon and Thurrock University Hospitals NHS Foundation Trust	BAS	Basildon University Hospital	293	75%	81%	86%	39%	100%	98%	98%	84%	53%
Bedford Hospital NHS Trust	BED	Bedford Hospital	257	82%	91%	91%	61%	88%	34%	36%	69%	10%
Blackpool Teaching Hospitals NHS Foundation Trust	VIC	Blackpool Victoria Hospital	585	82%	91%	94%	44%	100%	89%	89%	82%	1%
Bolton NHS Foundation Trust	BOL	Royal Bolton Hospital	189	95%	97%	100%	97%	99%	25%	32%	80%	4%
Bradford Teaching Hospitals NHS Foundation Trust	BRD	Bradford Royal Infirmary	410	92%	95%	96%	96%	88%	67%	82%	52%	1%
Brighton and Sussex University Hospitals NHS Trust	PRH	Princess Royal Hospital (Haywards Heath)	231	72%	85%	78%	45%	100%	47%	78%	39%	1%
Brighton and Sussex University Hospitals NHS Trust	RSC	Royal Sussex County Hospital	458	74%	85%	78%	52%	97%	52%	67%	54%	2%
Buckinghamshire Healthcare NHS Trust	SMV	Stoke Mandeville Hospital	114	70%	74%	54%	43%	91%	44%	74%	21%	4%
Buckinghamshire Healthcare NHS Trust	AMG	Wycombe Hospital	201	55%	74%	82%	59%	98%	55%	67%	67%	15%
Burton Hospitals NHS Foundation Trust	BRT	Queen's Hospital (Burton)	253	91%	94%	94%	89%	81%	36%	60%	48%	3%
Calderdale and Huddersfield NHS Foundation Trust	RHI	Calderdale Royal Hospital	219	73%	86%	83%	60%	95%	35%	50%	57%	5%
Calderdale and Huddersfield NHS Foundation Trust	HUD	Huddersfield Royal Infirmary	250	78%	89%	72%	48%	95%	46%	57%	32%	1%

Cambridge University Hospitals NHS Foundation Trust	ADD	Addenbrooke's Hospital	449	84%	89%	92%	60%	37%	34%	35%	26%	3%
Central Manchester University Hospitals NHS Foundation Trust	MRI	Manchester Royal Infirmary	287	76%	90%	92%	55%	82%	68%	76%	57%	9%
Central Manchester University Hospitals NHS Foundation Trust	TRA	Trafford General Hospital	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chelsea and Westminster Hospital NHS Foundation Trust	WES	Chelsea and Westminister Hospital	119	75%	91%	75%	40%	99%	57%	69%	72%	8%
Chesterfield Royal Hospital NHS Foundation Trust	CHE	Chesterfield Royal Hospital	202	71%	82%	81%	32%	97%	43%	60%	20%	2%
City Hospitals Sunderland NHS Foundation Trust	SUN	Sunderland Royal Hospital	212	99%	99%	97%	31%	96%	93%	94%	78%	2%
Colchester Hospital University NHS Foundation Trust	COL	Colchester General Hospital	495	65%	74%	83%	33%	100%	99%	98%	25%	34%
Countess of Chester Hospital NHS Foundation Trust	COC	Countess of Chester Hospital	387	81%	87%	90%	44%	90%	51%	62%	37%	27%
County Durham and Darlington NHS Foundation Trust	DAR	Darlington Memorial Hospital	240	62%	75%	85%	43%	79%	82%	81%	44%	5%
County Durham and Darlington NHS Foundation Trust	DRY	University Hospital of North Durham	314	56%	70%	80%	28%	42%	41%	45%	32%	1%
Croydon Health Services NHS Trust	MAY	Croydon University Hospital	269	73%	83%	83%	56%	96%	67%	79%	54%	2%
Dartford and Gravesham NHS Trust	DVH	Darent Valley Hospital	342	71%	86%	87%	36%	93%	16%	28%	52%	3%
Derby Hospitals NHS Foundation Trust	DER	Royal Derby Hospital	401	49%	71%	71%	27%	100%	98%	98%	87%	9%
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	BSL	Bassetlaw Hospital	106	73%	77%	75%	48%	93%	24%	33%	42%	4%

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Doncaster and Bassetlaw Hospitals NHS Foundation Trust	DID	Doncaster Royal Infirmary	170	69%	90%	83%	38%	96%	55%	63%	66%	4%
Dorset County Hospital NHS Foundation Trust	WDH	Dorset County Hospital	208	59%	72%	83%	43%	99%	27%	34%	36%	2%
Ealing Hospital NHS Trust	EAL	Ealing Hospital	281	53%	68%	85%	51%	98%	6%	7%	84%	13%
East and North Hertfordshire NHS Trust	LIS	Lister Hospital	180	63%	81%	87%	41%	100%	64%	75%	79%	13%
East and North Hertfordshire NHS Trust	QEW	Queen Elizabeth II Hospital	90	46%	63%	78%	32%	100%	33%	42%	31%	0%
East Cheshire NHS Trust	MAC	Macclesfield District General Hospital	207	48%	69%	84%	34%	82%	67%	70%	66%	2%
East Kent Hospitals University NHS Foundation Trust	KCC	Kent and Canterbury Hospital	175	80%	87%	75%	39%	72%	62%	78%	26%	28%
East Kent Hospitals University NHS Foundation Trust	QEQ	Queen Elizabeth the Queen Mother Hospital	157	75%	84%	76%	60%	71%	55%	72%	11%	3%
East Kent Hospitals University NHS Foundation Trust	WHH	William Harvey Hospital	189	54%	81%	71%	49%	71%	70%	82%	36%	3%
East Lancashire Hospitals NHS Trust	BLA	Royal Blackburn Hospital	461	83%	99%	98%	61%	86%	76%	84%	74%	6%
East Sussex Healthcare NHS Trust	CGH	Conquest Hospital	193	69%	99%	68%	34%	100%	70%	74%	20%	0%
East Sussex Healthcare NHS Trust	DGE	Eastbourne District General Hospital	222	73%	100%	75%	49%	99%	69%	77%	38%	0%
Epsom and St Helier University Hospitals NHS Trust	EPS	Epsom Hospital	176	67%	76%	76%	59%	99%	59%	93%	53%	3%

Epsom and St Helier University Hospitals NHS Trust	SHC	St Helier Hospital	226	56%	84%	89%	68%	95%	70%	94%	52%	1%
Frimley Park Hospital NHS Foundation Trust	FRM	Frimley Park Hospital	353	52%	67%	71%	49%	50%	68%	77%	43%	2%
Gateshead Health NHS Foundation Trust	QEG	Queen Elizabeth Hospital (Gateshead)	347	83%	95%	95%	42%	99%	92%	96%	17%	60%
George Eliot Hospital NHS Trust	NUN	George Eliot Hospital	118	65%	74%	89%	42%	10%	0%	0%	63%	1%
Gloucestershire Hospitals NHS Foundation Trust	CHG	Cheltenham General Hospital	50	79%	87%	89%	86%	79%	32%	44%	32%	0%
Gloucestershire Hospitals NHS Foundation Trust	GLO	Gloucestershire Royal Hospital	78	83%	91%	94%	79%	70%	42%	50%	31%	0%
Great Western Hospitals NHS Foundation Trust	PMS	Great Western Hospital	498	75%	95%	82%	72%	100%	29%	50%	51%	7%
Guy's and St Thomas' NHS Foundation Trust	STH	St Thomas' Hospital	307	63%	78%	84%	51%	95%	81%	90%	78%	5%
Hampshire Hospitals NHS Foundation Trust	NHH	Basingstoke and North Hampshire Hospital	217	68%	81%	82%	46%	90%	59%	69%	24%	1%
Hampshire Hospitals NHS Foundation Trust	RHC	Royal Hampshire County Hospital	150	67%	81%	75%	48%	100%	25%	29%	32%	1%
Harrogate and District NHS Foundation Trust	HAR	Harrogate District Hospital	82	84%	95%	89%	46%	96%	27%	56%	48%	17%
Heart of England NHS Foundation Trust	EBH	Birmingham Heartlands Hospital	174	70%	84%	73%	39%	99%	86%	88%	40%	5%
Heart of England NHS Foundation Trust	GHS	Good Hope Hospital	49	47%	74%	71%	55%	94%	60%	68%	40%	0%
Heart of England NHS Foundation Trust	SOL	Solihull Hospital	139	74%	85%	81%	44%	100%	83%	88%	49%	2%
Heatherwood and Wexham Park Hospitals NHS Foundation Trust	WEX	Wexham Park Hospital	262	62%	78%	82%	55%	95%	53%	61%	74%	11%
Hinchingbrooke Health Care NHS Trust	HIN	Hinchingbrooke Hospital	14	100%	100%	80%	70%	100%	93%	100%	92%	0%

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Homerton University Hospital NHS Foundation Trust	HOM	Homerton University Hospital	249	63%	87%	89%	36%	91%	49%	60%	55%	7%
Hull and East Yorkshire Hospitals NHS Trust	CHH	Castle Hill Hospital	495	73%	80%	85%	57%	89%	66%	74%	89%	20%
Hull and East Yorkshire Hospitals NHS Trust	HRI	Hull Royal Infirmary	121	44%	63%	78%	35%	90%	66%	78%	71%	2%
Imperial College Healthcare NHS Trust	CCH	Charing Cross Hospital	85	77%	97%	74%	36%	100%	40%	54%	59%	3%
Imperial College Healthcare NHS Trust	HAM	Hammersmith Hospital	283	74%	90%	80%	68%	100%	31%	47%	61%	2%
Imperial College Healthcare NHS Trust	STM	St Mary's Hospital Paddington	85	59%	82%	80%	64%	95%	66%	78%	64%	6%
Isle of Wight NHS PCT	IOW	St Mary's Hospital, Newport	188	64%	86%	50%	45%	95%	20%	22%	15%	1%
James Paget University Hospitals NHS Foundation Trust	JPH	James Paget University Hospital	302	69%	82%	81%	51%	89%	87%	91%	65%	1%
Kettering General Hospital NHS Foundation Trust	KGH	Kettering General Hospital	338	62%	73%	93%	75%	96%	59%	77%	59%	1%
King's College Hospital NHS Foundation Trust	KCH	King's College Hospital	331	83%	92%	92%	57%	89%	69%	81%	83%	24%
King's College Hospital NHS Foundation Trust	BRO	Princess Royal University Hospital (Bromley)	1	n/a	n/a	n/a	n/a	100%	0%	0%	0%	0%
Kingston Hospital NHS Trust	KTH	Kingston Hospital	177	60%	78%	62%	34%	94%	8%	13%	49%	22%
Lancashire Teaching Hospitals NHS Foundation Trust	CHO	Chorley and South Ribble Hospital	229	80%	98%	95%	57%	99%	100%	99%	84%	15%

Lancashire Teaching Hospitals NHS Foundation Trust	RPH	Royal Preston Hospital	456	71%	82%	92%	41%	98%	99%	99%	73%	18%
Leeds Teaching Hospitals NHS Trust	LGI	Leeds General Infirmary	697	62%	79%	84%	59%	93%	70%	78%	74%	6%
Lewisham and Greenwich NHS Trust	GWH	Queen Elizabeth Hospital (Woolwich)	295	81%	92%	82%	49%	88%	63%	80%	35%	0%
Lewisham and Greenwich NHS Trust	LEW	University Hospital Lewisham	253	70%	83%	89%	48%	76%	29%	45%	79%	1%
Liverpool Heart and Chest Hospital NHS Foundation Trust	BHL	Liverpool Heart and Chest Hospital	35	100%	100%	93%	53%	97%	60%	56%	93%	52%
Luton and Dunstable Hospital NHS Foundation Trust	LDH	Luton and Dunstable Hospital	244	82%	92%	82%	63%	90%	49%	63%	62%	7%
Maidstone and Tunbridge Wells NHS Trust	MAI	Maidstone Hospital	171	69%	81%	86%	53%	75%	70%	84%	64%	1%
Maidstone and Tunbridge Wells NHS Trust	KSX	Tunbridge Wells Hospital	191	77%	100%	90%	80%	87%	92%	96%	86%	7%
Medway NHS Foundation Trust	MDW	Medway Maritime Hospital	163	83%	93%	96%	80%	96%	71%	89%	59%	11%
Mid Cheshire Hospitals NHS Foundation Trust	LGH	Leighton Hospital	197	75%	93%	91%	67%	97%	65%	68%	27%	1%
Mid Essex Hospital Services NHS Trust	BFH	Broomfield Hospital	209	89%	98%	98%	49%	100%	99%	99%	65%	28%
Mid Staffordshire NHS Foundation Trust	SDG	Stafford Hospital	134	77%	83%	74%	30%	70%	35%	53%	41%	2%
Mid Yorkshire Hospitals NHS Trust	DEW	Dewsbury and District Hospital	312	74%	83%	80%	39%	98%	51%	64%	42%	46%
Mid Yorkshire Hospitals NHS Trust	PIN	Pinderfields Hospital	382	64%	83%	86%	57%	91%	57%	62%	58%	52%
Milton Keynes Hospital NHS Foundation Trust	MKH	Milton Keynes General Hospital	306	81%	95%	93%	67%	100%	32%	43%	77%	9%
Norfolk and Norwich University Hospitals NHS Foundation Trust	NOR	Norfolk and Norwich University Hospital	303	77%	100%	100%	100%	100%	68%	73%	88%	5%

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North Bristol NHS Trust	FRY	Frenchay Hospital	257	59%	69%	80%	38%	96%	28%	33%	16%	1%
North Bristol NHS Trust	BSM	Southmead Hospital	230	50%	61%	76%	59%	98%	28%	36%	37%	0%
North Cumbria University Hospitals NHS Trust	CMI	Cumberland Infirmary	33	59%	70%	65%	21%	97%	73%	75%	61%	3%
North Cumbria University Hospitals NHS Trust	WCI	West Cumberland Hospital	31	67%	67%	60%	16%	97%	70%	76%	67%	10%
North Middlesex University Hospital NHS Trust	NMH	North Middlesex University Hospital	205	64%	79%	81%	34%	98%	76%	84%	51%	4%
North Tees and Hartlepool NHS Foundation Trust	HGH	University Hospital of Hartlepool	71	100%	100%	97%	100%	83%	40%	41%	38%	0%
North Tees and Hartlepool NHS Foundation Trust	NTG	University Hospital of North Tees	253	98%	98%	97%	100%	74%	60%	65%	31%	41%
Northampton General Hospital NHS Trust	NTH	Northampton General Hospital	290	97%	98%	96%	77%	91%	83%	92%	39%	15%
Northern Devon Healthcare NHS Trust	NDD	North Devon District Hospital	270	86%	91%	91%	75%	91%	41%	70%	48%	5%
Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	GGH	Diana Princess of Wales Hospital	160	91%	100%	95%	79%	93%	52%	58%	81%	9%
Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	SCU	Scunthorpe General Hospital	202	61%	73%	73%	41%	97%	31%	40%	38%	4%
Northumbria Healthcare NHS Foundation Trust	HEX	Hexham General Hospital	24	75%	78%	64%	30%	20%	20%	27%	38%	7%
Northumbria Healthcare NHS Foundation Trust	NTY	North Tyneside Hospital	173	71%	81%	82%	26%	63%	41%	54%	60%	0%
Northumbria Healthcare NHS Foundation Trust	ASH	Wansbeck General Hospital	131	77%	88%	88%	49%	58%	63%	71%	64%	7%
Nottingham University Hospitals NHS Trust	CHN	Nottingham City Hospital	33	93%	94%	80%	73%	75%	55%	60%	67%	0%

Nottingham University Hospitals NHS Trust	UHN	Queen's Medical Centre	100	84%	86%	70%	37%	46%	36%	40%	28%	0%
Oxford Radcliffe Hospitals NHS Trust	HOR	Horton General Hospital	186	94%	97%	98%	93%	99%	89%	94%	34%	38%
Oxford Radcliffe Hospitals NHS Trust	RAD	John Radcliffe Hospital	500	93%	99%	90%	93%	96%	81%	91%	59%	26%
Pennine Acute Hospitals NHS Trust	BRY	Fairfield General Hospital	325	71%	79%	81%	44%	61%	64%	76%	36%	1%
Pennine Acute Hospitals NHS Trust	NMG	North Manchester General Hospital	203	76%	80%	92%	43%	65%	76%	89%	41%	0%
Pennine Acute Hospitals NHS Trust	BHH	Rochdale Infirmary	48	33%	33%	0%	27%	53%	51%	100%	39%	0%
Pennine Acute Hospitals NHS Trust	OHM	Royal Oldham Hospital	274	86%	88%	90%	52%	65%	76%	90%	52%	1%
Peterborough and Stamford Hospitals NHS Foundation Trust	PET	Peterborough City Hospital	381	91%	96%	88%	84%	78%	65%	75%	58%	7%
Plymouth Hospitals NHS Trust	PLY	Derriford Hospital	297	66%	76%	87%	74%	100%	n/a	n/a	n/a	n/a
Poole Hospital NHS Foundation Trust	PGH	Poole General Hospital	252	44%	66%	78%	32%	87%	55%	63%	29%	10%
Portsmouth Hospitals NHS Trust	QAP	Queen Alexandra Hospital	389	64%	77%	80%	75%	100%	87%	92%	31%	6%
Rotherham NHS Foundation Trust	ROT	Rotherham Hospital	279	55%	73%	77%	51%	77%	54%	61%	46%	23%
Royal Berkshire NHS Foundation Trust	BHR	Royal Berkshire Hospital	354	79%	91%	92%	50%	98%	84%	91%	34%	2%
Royal Brompton and Harefield NHS Foundation Trust	HH	Harefield Hospital	194	68%	90%	93%	81%	93%	69%	69%	94%	26%
Royal Brompton and Harefield NHS Foundation Trust	NHB	Royal Brompton Hospital	202	68%	91%	93%	71%	99%	47%	58%	97%	3%
Royal Cornwall Hospitals NHS Trust	RCH	Royal Cornwall Hospital	195	56%	64%	76%	37%	51%	43%	45%	45%	50%

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Royal Devon and Exeter NHS Foundation Trust	RDE	Royal Devon & Exeter Hospital	349	100%	100%	100%	98%	72%	21%	23%	32%	3%
Royal Free London NHS Trust	RFH	Royal Free Hospital	251	71%	89%	93%	54%	95%	45%	58%	70%	1%
Royal Liverpool and Broadgreen University Hospitals NHS Trust	RLU	Royal Liverpool University Hospital	333	82%	96%	94%	51%	69%	74%	84%	59%	7%
Royal Surrey County Hospital NHS Foundation Trust	RSU	Royal Surrey County Hospital	199	79%	90%	74%	29%	95%	44%	70%	55%	4%
Royal United Hospital Bath NHS Trust	BAT	Royal United Hospital Bath	170	81%	84%	82%	70%	100%	43%	39%	49%	6%
Salford Royal NHS Foundation Trust	SLF	Salford Royal	341	84%	95%	93%	56%	74%	72%	83%	54%	2%
Salisbury NHS Foundation Trust	SAL	Salisbury District Hospital	199	60%	84%	84%	43%	100%	60%	64%	29%	7%
Sandwell and West Birmingham Hospitals NHS Trust	DUD	Birmingham City Hospital	163	81%	93%	91%	54%	97%	73%	75%	85%	18%
Sandwell and West Birmingham Hospitals NHS Trust	SAN	Sandwell General Hospital	182	78%	100%	96%	94%	94%	96%	98%	87%	23%
Sheffield Teaching Hospitals NHS Foundation Trust	NGS	Northern General Hospital	465	60%	71%	78%	48%	97%	49%	54%	22%	3%
Sherwood Forest Hospitals NHS Foundation Trust	KMH	King's Mill Hospital	403	82%	90%	85%	58%	89%	45%	66%	42%	2%
Sherwood Forest Hospitals NHS Foundation Trust	NHN	Newark Hospital	6	n/a	n/a	n/a	n/a	n/a	40%	0%	0%	0%
Shrewsbury and Telford Hospitals NHS Trust	TLF	Princess Royal Hospital (Telford)	59	82%	90%	83%	45%	100%	100%	100%	61%	9%

Shrewsbury and Telford Hospitals NHS Trust	RSS	Royal Shrewsbury Hospital	68	77%	87%	86%	29%	100%	99%	99%	47%	2%
South Devon Healthcare NHS Foundation Trust	TOR	Torbay Hospital	507	89%	91%	73%	37%	95%	54%	72%	48%	1%
South Tees Hospitals NHS Foundation Trust	FRH	Friarage Hospital	26	74%	92%	92%	30%	100%	95%	95%	76%	53%
South Tees Hospitals NHS Foundation Trust	SCM	James Cook University Hospital	338	75%	87%	84%	26%	89%	93%	94%	82%	18%
South Tyneside NHS Foundation Trust	STD	South Tyneside District Hospital	237	74%	85%	86%	36%	93%	91%	94%	78%	22%
South Warwickshire NHS Foundation Trust	WAR	Warwick Hospital	181	64%	81%	74%	39%	78%	37%	47%	71%	6%
Southend University Hospital NHS Foundation Trust	SEH	Southend Hospital	359	69%	80%	82%	55%	89%	65%	90%	39%	2%
Southport and Ormskirk Hospital NHS Trust	SOU	Southport and Formby District General Hospital	262	96%	97%	100%	84%	100%	75%	92%	46%	92%
St George's Healthcare NHS Trust	GEO	St George's Hospital	446	55%	79%	85%	44%	74%	63%	72%	55%	8%
St Helens and Knowsley Teaching Hospitals NHS Trust	WHI	Whiston Hospital	270	98%	98%	99%	95%	99%	88%	94%	41%	0%
Stockport NHS Foundation Trust	SHH	Stepping Hill Hospital	330	67%	86%	84%	47%	72%	18%	25%	45%	14%
Surrey and Sussex Healthcare NHS Trust	ESU	East Surrey Hospital	214	100%	100%	94%	98%	n/a	79%	88%	64%	0%
Tameside Hospital NHS Foundation Trust	TGA	Tameside General Hospital	260	77%	93%	99%	63%	42%	55%	63%	46%	4%
Taunton and Somerset NHS Foundation Trust	MPH	Musgrove Park Hospital	291	60%	75%	81%	46%	37%	26%	31%	31%	1%
The Dudley Group NHS Foundation Trust	RUS	Russells Hall Hospital	351	56%	75%	67%	36%	81%	61%	65%	66%	12%
The Hillingdon Hospitals NHS Foundation Trust	HIL	Hillingdon Hospital	186	43%	67%	59%	40%	89%	44%	53%	58%	2%

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The Ipswich Hospital NHS Trust	IPS	Ipswich Hospital	164	74%	82%	83%	55%	93%	35%	60%	31%	0%
The Newcastle Upon Tyne Hospitals NHS Foundation Trust	FRE	Freeman Hospital and Royal Victoria Infirmary	489	63%	78%	71%	35%	90%	60%	66%	75%	6%
The North West London Hospitals NHS Trust	CMH	Central Middlesex Hospital	93	71%	83%	85%	40%	18%	17%	26%	29%	1%
The North West London Hospitals NHS Trust	NPH	Northwick Park Hospital	194	66%	78%	84%	29%	7%	10%	22%	30%	0%
The Princess Alexandra Hospital NHS Trust	PAH	Princess Alexandra Hospital	118	73%	87%	89%	62%	94%	33%	41%	70%	1%
The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust	QKL	Queen Elizabeth Hospital (King's Lynn)	213	72%	83%	89%	42%	93%	5%	7%	27%	8%
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	BOU	Royal Bournemouth General Hospital	453	66%	77%	85%	50%	78%	7%	9%	46%	3%
The Royal Wolverhampton Hospitals NHS Trust	NCR	New Cross Hospital	69	58%	69%	77%	38%	53%	48%	58%	40%	0%
The Whittington Hospital NHS Trust	WHT	Whittington Hospital	160	91%	97%	93%	77%	97%	71%	92%	70%	10%
United Lincolnshire Hospitals NHS Trust	GRA	Grantham and District Hospital	96	75%	93%	94%	36%	100%	24%	30%	66%	0%
United Lincolnshire Hospitals NHS Trust	LIN	Lincoln County Hospital	121	54%	71%	63%	39%	97%	24%	35%	57%	1%
United Lincolnshire Hospitals NHS Trust	PIL	Pilgrim Hospital	191	65%	73%	79%	54%	95%	26%	39%	48%	4%
University College London Hospitals NHS Foundation Trust	UCL	University College Hospital	323	96%	99%	97%	82%	99%	97%	99%	94%	89%

University Hospital of North Staffordshire NHS Trust	STO	University Hospital of North Staffordshire	676	53%	61%	61%	20%	78%	76%	92%	47%	6%
University Hospital of South Manchester NHS Foundation Trust	WYT	Wythenshawe Hospital	235	96%	98%	93%	67%	99%	50%	59%	57%	10%
University Hospital Southampton NHS Trust	SGH	Southampton General Hospital	324	65%	77%	80%	72%	93%	14%	17%	50%	10%
University Hospitals Birmingham NHS Foundation Trust	QEB	Queen Elizabeth Hospital (Edgbaston)	297	68%	78%	72%	40%	87%	70%	83%	48%	3%
University Hospitals Bristol NHS Foundation Trust	BRI	Bristol Royal Infirmary	347	69%	81%	80%	51%	94%	76%	75%	77%	4%
University Hospitals Coventry and Warwickshire NHS Trust	WAL	University Hospital Coventry	390	73%	84%	88%	56%	86%	54%	73%	37%	7%
University Hospitals of Leicester NHS Trust	GRL	Glenfield Hospital	669	57%	71%	78%	42%	84%	55%	59%	77%	40%
University Hospitals of Leicester NHS Trust	LER	Leicester Royal Infirmary	96	57%	65%	73%	22%	63%	8%	6%	14%	6%
University Hospitals of Morecambe Bay NHS Foundation Trust	FGH	Furness General Hospital	158	79%	94%	89%	45%	99%	84%	88%	70%	4%
University Hospitals of Morecambe Bay NHS Foundation Trust	RLI	Royal Lancaster Infirmary	175	86%	100%	99%	60%	94%	82%	86%	44%	5%
Walsall Healthcare NHS Trust	WMH	Manor Hospital	250	99%	99%	100%	97%	96%	99%	99%	59%	11%
Warrington and Halton Hospitals NHS Foundation Trust	WDG	Warrington Hospital	95	84%	96%	93%	55%	97%	90%	90%	73%	34%
West Hertfordshire Hospitals NHS Trust	WAT	Watford General Hospital	579	100%	100%	100%	99%	99%	63%	76%	85%	3%
West Middlesex University Hospital NHS Trust	WMU	West Middlesex University Hospital	225	68%	80%	85%	66%	98%	70%	80%	31%	3%

Trust name	NICOR hospital code	Hospital name	Heart failure admissions (n)	ACEI on discharge (%)	ACEI/ ARB on discharge (%)	Beta blocker on discharge (%)	MRA on discharge (%)	Received discharge planning (%)	Referral to HF nurse follow-up (%)	Referral to HF nurse follow-up (LVSD only) (%)	Referral to cardiology follow-up (%)	Referral to cardiac rehabilitation (%)
West Suffolk NHS Foundation Trust	WSH	West Suffolk Hospital	283	66%	82%	85%	57%	97%	38%	50%	48%	8%
Western Sussex Hospitals NHS Trust	STR	St Richard's Hospital	300	74%	86%	81%	36%	91%	46%	63%	29%	3%
Western Sussex Hospitals NHS Trust	WRG	Worthing Hospital	325	96%	96%	98%	99%	64%	66%	78%	40%	8%
Weston Area Health NHS Trust	WGH	Weston General Hospital	69	50%	83%	87%	44%	100%	5%	3%	37%	0%
Wirral University Teaching Hospital NHS Foundation Trust	WIR	Arrowe Park Hospital	403	93%	98%	97%	70%	99%	78%	88%	46%	35%
Worcestershire Acute Hospitals NHS Trust	RED	Alexandra Hospital	192	64%	79%	74%	30%	90%	40%	53%	58%	66%
Worcestershire Acute Hospitals NHS Trust	WRC	Worcestershire Royal Hospital	78	74%	84%	82%	59%	100%	99%	99%	73%	11%
Wrightington, Wigan and Leigh NHS Foundation Trust	AEI	Royal Albert Edward Infirmary	437	70%	95%	98%	28%	92%	72%	83%	72%	100%
Wye Valley NHS Trust	HCH	County Hospital Hereford	144	54%	66%	60%	34%	94%	43%	68%	47%	2%
Yeovil District Hospital NHS Foundation Trust	YEO	Yeovil District Hospital	183	74%	84%	77%	24%	97%	97%	96%	45%	35%
York Teaching Hospital NHS Foundation Trust	SCA	Scarborough General Hospital	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
York Teaching Hospital NHS Foundation Trust	YDH	The York Hospital	293	76%	82%	83%	60%	6%	29%	44%	45%	3%

6.2.3 In-hospital care in Wales

Health Board name	NICOR hospital code	Hospital name	Heart failure admissions (n)	Received echo (%)	Cardiology inpatient (%)	Input from consultant cardiologist (%)	Input from specialist (%)
England and Wales			**49798**	**92%**	**49%**	**60%**	**78%**
Abertawe Bro Morgannwg University Health Board	MOR	Morriston Hospital	249	92%	59%	69%	72%
Abertawe Bro Morgannwg University Health Board	POW	Princess Of Wales Hospital	244	97%	68%	78%	79%
Abertawe Bro Morgannwg University Health Board	SIN	Singleton Hospital	109	83%	42%	46%	47%
Aneurin Bevan Health Board	NEV	Nevill Hall Hospital	209	98%	54%	58%	68%
Aneurin Bevan Health Board	GWE	Royal Gwent Hospital	161	100%	53%	64%	65%
Aneurin Bevan Health Board	YYF	Ysbyty Ystrad Fawr	0	n/a	n/a	n/a	n/a
Betsi Cadwaladr University Health Board	CLW	Glan Clwyd Hospital	281	92%	40%	46%	52%
Betsi Cadwaladr University Health Board	LLA	Llandudno General Hospital	0	n/a	n/a	n/a	n/a
Betsi Cadwaladr University Health Board	WRX	Wrexham Maelor Hospital	180	99%	56%	60%	69%
Betsi Cadwaladr University Health Board	GWY	Ysbyty Gwynedd Hospital	134	86%	38%	52%	55%
Cardiff & Vale University Health Board	LLD	University Hospital Llandough	146	80%	0%	8%	37%
Cardiff & Vale University Health Board	UHW	University Hospital of Wales	223	78%	43%	58%	59%
Cwm Taf University Health Board	PCH	Prince Charles Hospital	207	100%	59%	74%	78%
Cwm Taf University Health Board	RGH	Royal Glamorgan Hospital	119	99%	55%	68%	84%
Hywel Dda Health Board	BRG	Bronglais General Hospital	191	96%	82%	90%	90%
Hywel Dda Health Board	WWG	Glangwili General Hospital	69	91%	49%	60%	60%
Hywel Dda Health Board	PPH	Prince Philip Hospital	114	99%	34%	47%	51%
Hywel Dda Health Board	WYB	Withybush General Hospital	140	86%	36%	30%	30%

6.2.4 Treatment and management on discharge in Wales

Health Board name	NICOR hospital code	Hospital name	Heart failure admissions (n)	ACEI on discharge (%)	ACEI/ ARB on discharge (%)	Beta blocker on discharge (%)	MRA on discharge (%)	Received discharge planning (%)	Referral to HF nurse follow-up (%)	Referral to HF nurse follow-up (LVSD only) (%)	Referral to cardiology follow-up (%)	Referral to cardiac rehabilitation (%)
England and Wales			**49798**	**72%**	**85%**	**85%**	**52%**	**86%**	**59%**	**69%**	**54%**	**10%**
Abertawe Bro Morgannwg University Health Board	MOR	Morriston Hospital	249	91%	99%	97%	85%	89%	51%	60%	77%	35%
Abertawe Bro Morgannwg University Health Board	POW	Princess Of Wales Hospital	244	78%	99%	96%	63%	98%	29%	43%	44%	1%
Abertawe Bro Morgannwg University Health Board	SIN	Singleton Hospital	109	83%	91%	91%	43%	78%	8%	13%	53%	4%
Aneurin Bevan Health Board	NEV	Nevill Hall Hospital	209	91%	93%	91%	76%	79%	57%	68%	38%	24%
Aneurin Bevan Health Board	GWE	Royal Gwent Hospital	161	90%	93%	89%	58%	52%	57%	66%	53%	8%
Aneurin Bevan Health Board	YYF	Ysbyty Ystrad Fawr*	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Betsi Cadwaladr University Health Board	CLW	Glan Clwyd Hospital	281	80%	92%	86%	54%	54%	38%	52%	38%	2%
Betsi Cadwaladr University Health Board	WRX	Wrexham Maelor Hospital	180	71%	81%	89%	55%	89%	64%	80%	49%	1%
Betsi Cadwaladr University Health Board	GWY	Ysbyty Gwynedd Hospital	134	54%	67%	84%	48%	35%	21%	28%	39%	1%
Cardiff & Vale University Health Board	LLD	University Hospital Llandough	146	95%	96%	94%	64%	49%	49%	52%	20%	0%
Cardiff & Vale University Health Board	UHW	University Hospital of Wales	223	95%	96%	91%	67%	62%	40%	46%	52%	2%
Cwm Taf University Health Board	PCH	Prince Charles Hospital	207	63%	73%	75%	34%	71%	29%	36%	53%	6%
Cwm Taf University Health Board	RGH	Royal Glamorgan Hospital	119	64%	81%	80%	61%	72%	39%	49%	35%	2%
Hywel Dda Health Board	BRG	Bronglais General Hospital	191	88%	97%	99%	91%	48%	93%	97%	42%	24%
Hywel Dda Health Board	WWG	Glangwili General Hospital	69	56%	81%	67%	44%	96%	49%	64%	26%	5%
Hywel Dda Health Board	PPH	Prince Philip Hospital	114	67%	82%	94%	45%	83%	46%	65%	44%	2%
Hywel Dda Health Board	WYB	Withybush General Hospital	140	82%	86%	85%	52%	3%	0%	0%	21%	13%

7 Appendices

A. National Heart Failure Audit Steering Group membership

Name	Job title and organisation	Stakeholder representation
Theresa McDonagh	Consultant Cardiologist (KCH) and Professor of Heart Failure (KCL) and National Heart Failure Audit Clinical Lead	Clinical lead, Chair
Suzanna Hardman	Consultant Cardiologist (Whittington Hospital) and past Chair of British Society of Heart Failure (BSH)	BSH
John Cleland	Chair in Clinical Cardiology (Imperial College London)	Consultant cardiologist (England), HALO
Gethin Ellis	Consultant cardiologist (Cwm Taf University Local Health Board) and Network Lead Cardiologist (South East Wales, South Wales Cardiac Network)	Consultant cardiologist (Wales)
Jackie Austin	Nurse Consultant (Aneurin Bevan Health Board) and Lead Nurse South Wales Cardiac Network	Cardiac network/Heart Failure Nurse Specialist (Wales)
Jim Moore	General Practitioner and GP with Special Interest, Gloucestershire Heart Failure Service	Primary care physician
Gemma Baldock-Apps	Cardiology Audit and Data Manager (East Sussex Healthcare NHS Trust)	Audit and clinical effectiveness, database user
Janine Beezer	Heart Failure Specialist Clinical Pharmacist (City Hospitals Sunderland)	Heart Failure Specialist Clinical Pharmacist, database user
Dawn Lambert	Heart Failure Nurse Specialist (Portsmouth Hospitals NHS Trust)	Heart Failure Nurse Specialist, database user
Kathy Simmonds	Heart Failure Nurse Specialist (Kettering General Hospital NHS Foundation Trust)	Heart Failure Nurse Specialist, database user
Richard Mindham	Heart failure patient	Patient representative
Marion Standing	Senior Developer	NICOR
Aminat Shote	Information Analyst	NICOR
Akosua Donkor	National Heart Failure Audit Project Manager	NICOR

8 Glossary

Word	Acronym or abbreviation	Definition
(Acute) Myocardial Infarction	(A)MI	Commonly known as a heart attack, a myocardial infarction results from the interruption of blood supply to part of the heart, which causes heart muscle cells to die. The damage to the heart muscle carries a risk of sudden death, but those who survive often go on to suffer from heart failure.
Angiotensin II receptor antagonist/ angiotensin receptor blocker	ARB	A group of drugs usually prescribed for those patients who are intolerant of ACE inhibitors. Rather than lowering levels of angiotensin II, they instead prevent the chemical from having any effect on blood vessels.
Angiotensin-converting enzyme inhibitor	ACE inhibitor/ ACEI	A group of drugs used primarily for the treatment of high blood pressure and heart failure. They stop the body's ability to produce angiotensin II, a hormone which causes blood vessels to contract, thus dilating blood vessels and increasing the supply of blood and oxygen to the heart.
Beta blocker		A group of drugs which slow the heart rate, decrease cardiac output and lessen the force of heart muscle and blood vessel contractions. Used to treat abnormal or irregular heart rhythms, and abnormally fast heart rates.
British Society of Heart Failure	BSH	The professional society for healthcare professionals involved in the care of heart failure patients. The BSH aims to improve care and outcomes for heart failure patients by increasing knowledge and promoting research about the diagnosis, causes and management of heart failure.
Cardiac resynchronisation therapy	CRT	CRT, also known as biventricular pacing, aims to improve the heart's pumping efficiency by making the chambers of the heart pump together. 25-50% of all heart failure patients have hearts whose walls do not contract simultaneously. CRT involves implanting a CRT pacemaker or ICD (implantable cardioverter-defibrillator) that has a lead positioned in each ventricle. Most devices also include a third lead which is positioned in the right atrium to ensure that the atria and ventricles contract together.
Chronic obstructive pulmonary disease	COPD	The co-occurrence of chronic bronchitis and emphysema, a pair of commonly co-existing lung diseases in which the airways become narrowed. This leads to a limitation of the flow of air to and from the lungs, causing shortness of breath (dyspnoea). In contrast to asthma, this limitation is poorly reversible and usually gets progressively worse over time.
Contraindication		A factor serving as a reason to withhold medical treatment, due to its unsuitability.
Diuretic		A group of drugs which help to remove extra fluid from the body by increasing the amount of water passed through the kidneys. Loop diuretics are often used in heart failure patients to ease symptoms of oedema and breathlessness.
Echocardiography	Echo	A diagnostic test which uses ultrasound to create two dimensional images of the heart. This allows clinicians to examine the size of the chambers of the heart and its pumping function in detail, as well as examine valves and the myocardium (heart muscle).
Electrocardiography	ECG/EKG	A diagnostic test which records the rhythm and electrical activity of the heart. Electrodes (sticky patches, connected to wires which lead to a recording machine) are attached to the arms, legs and chest, and pick up electrical signals produced by each heartbeat. ECGs are sometimes taken whilst a patient is excercising on a treadmill or exercise bike. Information from exercise tests can help doctors to plan treatment, understand the severity of heart disease in the patient, and determine an optimal cardiac rehabilitation programme.
European Society of Cardiology	ESC	The ESC is a professional association for cardiologists across Europe, which aims to facilitate improved diagnosis and treatment of cardiovascular disease in Europe. It runs numerous education and training events, and edits and publishes nine journals on cardiology. The ESC has produced a Clinical Practice Guideline for acute and chronic heart failure, and a set of standards for delivering heart failure care, which the audit uses, along with NICE guidance, as a benchmark for good practice.

Heart failure		A syndrome characterised by the reduced ability of the heart to pump blood around the body, caused by structural or functional cardiac abnormalities. The condition is characterised by symptoms such as shortness of breath and fatigue, and signs such as fluid retention. Acute heart failure refers to the rapid onset of the symptoms and signs of heart failure, often resulting in a hospitalisation, whereas in chronic heart failure the symptoms develop more slowly.
Hospital Episode Statistics	HES	The national statistical data warehouse for England of the care provided by NHS hospitals and for NHS hospital patients treated elsewhere. HES is the data source for a wide range of healthcare analysis for the NHS, government and many other organisations. The National Heart Failure Audit uses HES data to calculate case ascertainment.
Left ventricular dysfunction	LVD	Any functional impairment of the left ventricle of the heart.
Left ventricular ejection fraction	LVEF	A measurement of how much blood is pumped out of the left ventricle with each heartbeat. An ejection fraction of below 40% may be an indication of heart failure.
Left ventricular systolic dysfunction	LVSD	A failure of the pumping function of the heart, characterized by a decreased ejection fraction and inadequate ventricular contraction. It is often caused by damage to the heart muscle, for example following a myocardial infarction (heart attack).
Medical Research Information Service	MRIS	A Health and Social Care Information Centre service which links datasets at the level of individual patient records for medical research projects. NICOR uses MRIS to determine the life status of patients included in the audit, so as to calculate mortality rates. MRIS also provides the audit with HES data for this report.
Mineralocorticoid receptor antagonist	MRA	A group of diuretic drugs, whose main action is to block the response to the hormone aldosterone, which promotes the retention of salt and the loss of potassium and magnesium. MRAs increase urination, reduce water and salt, and retain potassium. They help to lower blood pressure and increase the pumping ability of the heart.
National Clinical Audit and Patient Outcomes Programme	NCAPOP	A group of 40 national clinical audits, funded by the Department of Health and overseen by HQIP that collect data on the implementation of evidence based clinical standard in UK Trusts, and report on patient outcomes.
National Institute for Cardiovascular Outcomes Research	NICOR	Part of the National Centre for Cardiovascular Prevention and Outcomes, based in the Institute of Cardiovascular Science at University College London. NICOR manages six national clinical audits, including the National Heart Failure Audit, and three new technology registries.
New York Heart Association class	NYHA class	NYHA classification is used to describe degrees of heart failure by placing patients in one of four categories based on how much they are limited during physical activity: Class I (Mild): No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, or dyspnoea (shortness of breath). Class II (Mild): Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation, or dyspnoea. Class III (Moderate): Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, palpitation, or dyspnoea. Class IV (Severe): Unable to carry out any physical activity without discomfort. Symptoms of cardiac insufficiency at rest. If any physical activity is undertaken, discomfort is increased.
Oedema		An excess build-up of fluid in the body, causing tissue to become swollen. Heart failure patients often suffer from peripheral oedema, affecting the feet and ankles, and pulmonary oedema, in which fluid collects around the lungs.
Patient Episode Database of Wales	PEDW	The national statistics database for Wales, collecting data on all inpatient and outpatient activity undertaken in NHS hospitals in Wales, and on Welsh patients treated in English NHS Trusts.

9 References

1. Gibbs JSR, McCoy ASM, Gibbs LME, Rogers AE, Addington-Hall JM (2002), 'Living with and dying from heart failure: the role of palliative care', Heart 88, 36-39, **http://heart.bmj.com/content/88/suppl_2/ii36.full [accessed 31/07/2014]**.
2. Jiang W, Alexander J et al (2001), 'Relationship of depression to increased risk of mortality and rehospitalization in patients with congestive heart failure', Archives of Internal Medicine 161 (15), 1849-1856, **http://www.ncbi.nlm.nih.gov/pubmed/11493126 [accessed 31/07/2014]**.
3. British Heart Foundation Health Promotion Research Group (2012), Coronary heart disease statistics: 2012 edition, London: British Heart Foundation, p.58, **http://www.bhf.org.uk/publications/view-publication.aspx?ps=1002097 [accessed 31/07/2014]**.
4. Ibid. p.81.
5. National Institute for Health and Care Excellence (2010), CG108 Chronic heart failure: Management of chronic heart failure in adults in primary and secondary care, **http://nice.org.uk/cg108 [accessed 31/07/2014]**.
6. For example, ibid.; National Institute for Health and Care Excellence (2011), Chronic heart failure quality standard, http://nice.org.uk/qs9 [accessed 31/07/2014]; The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology (2012), 'Guideline for the treatment and management of acute and chronic heart failure', European Heart Journal 33 (14), 1787-1847, **http://eurheartj.oxfordjournals.org/content/33/14/1787.full [accessed 31/07/2014]**.
7. Ibid.
8. NICOR, Heart failure: Datasets and user guides, **http://www.ucl.ac.uk/nicor/audits/heartfailure/datasets [accessed 31/07/2014]**.
9. **http://www.england.nhs.uk/nhs-standard-contract/13-14/ and http://www.england.nhs.uk/nhs-standard-contract/ [both accessed 31/07/2014]**.
10. **http://www.wales.nhs.uk/sitesplus/documents/986/NCAOR%20ANNUAL%20PLAN%202013.14%20%28FINAL%29.pdf [accessed 31/07/2014]**.
11. Health and Social Care Information Centre Hospital Episode Statistics: Admitted Patient Care 2011-12, 'Summary Report', p.18, **https://catalogue.ic.nhs.uk/publications/hospital/inpatients/hosp-epis-stat-admi-pati-care-eng-2011-2012/hosp-epis-stat-admi-head-figs-11-12-rep.pdf [accessed 21/06/2013]**.

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