NATIONAL HEART FAILURE AUDIT (NHFA)

2020 SUMMARY REPORT (2018/19 DATA)

NICOR

CONTENTS

Hospitalisation for heart failure 1

Executive summary 2

1. Introduction 5

1.1 Number of patients in the audit 5
1.2 Demographics 6
1.3 Trends in symptoms 6
1.4 Type of LV dysfunction, causes and comorbidities of heart failure 6
1.5 Mortality 7

2. Quality improvement metrics 10

2.1 There is still room for improvement in the use of ECG and Echocardiography for assessment and diagnosis 10
2.2 More patients should be admitted to a cardiology ward 12
2.3 More patients on general wards should be seen by a HF team 12
2.4 Short lengths of stay may be associated with high readmission rates 14
2.5 Best-practice treatment at discharge for HFrEF should be followed 15
2.6 More patients should be offered specialist follow-up and rehabilitation 18

3. Future direction 20

3.1 Improving data quality and completeness 20
3.2 Identifying and understanding variance 20
3.3 Length of stay <24 hours 20
3.4 Next steps 20

References 21

Thanks and acknowledgements 22

Hospitalisation for Heart Failure 2018/19

Access to specialist HF care (by Cardiologists and Specialist HF nurses) is associated with improved in-hospital and out-of-hospital survival, and better treatment on discharge for HFrEF.

74,696
total admissions

	All patients hospitalised for heart failure	Patients managed on a cardiology ward	Those who saw a specialist
Patients diagnosed with echocardiography	87%	94%	91%
Patients receiving specialist care	82%	99%	100%
Patients with HFrEF discharged on all three disease-modifying drugs	48%	55%	56%
Patients who received a cardiology follow up	45%	64%	51%
Patients who received a Heart Failure nurse follow up	55%	66%	63%
Patients referred to cardiac rehabilitation	13.3%	21%	16%
Mortality in hospital	9.3%	6.7%	8.0%

Place of care is a key quality indicator for HF as care in cardiology wards is associated with improved in-hospital and out-of-hospital survival, better treatment on discharge for HFrEF, and more access to specialist care

EXECUTIVE SUMMARY

Although there have been no new treatments for Acute Heart Failure (AHF) in twenty years, this year's audit demonstrates that there remains considerable scope for improvement in patient outcomes by focusing on their in-patient and discharge management. The key message derived from this audit is that patient mortality, post-discharge, is highly dependent upon three hospital characteristics:

1. Patient care under the Cardiology team;
2. Patients with heart failure with reduced ejection fraction (HFrEF) being discharged on all three disease-modifying drugs; and
3. Patients having cardiology follow-up.

The audit presents a number of achievements in the 2018/19 cycle:

- ECGs are at an impressive 99%.
- Hospitals are not selecting patients with milder disease.
- Mortality is down despite an increasingly ageing population.

However, there is a considerable way to go before all hospitalised heart failure (HF) patients receive optimal care. The audit identifies the following areas for attention in reducing mortality further:

Focus of attention	Audit Finding
Patients to be seen on a cardiology ward	Only 45%; considerable variation between hospitals
Specialist input into care	Only 67% where patients are on non-cardiology wards
In-patient echocardiography	The gold standard of diagnosis, stuck at ~87%; considerable inter-hospital variation
Length of Stay (LOS)	A quality of care proxy; declining, posing risk of readmission
Discharge on the three disease-modifying drugs	Mixed performance with considerable variation, declining after median age 60
Follow-up appointments at 2 weeks + specialist follow-up	Very poor, below 50%
Rehabilitation	Lower mortality and better quality of life among those referred; very poor referral numbers (13%)

It is also notable that the heart failure with preserved ejection fraction (HFpEF) population is increasing as a proportion of all HF patients. Over time the older, more comorbid population with HFpEF will increase and there is no effective treatment available. Therefore, there is a pressing need for further research into this area.

At the end of this document there is a brief discussion of how the National Heart Failure Audit Domain Expert Group intends to probe variations in practice in order to share experiences and help institutions improve outcomes for their patients.

The following text summarises specific areas of interest, reinforcing the headline comments above on where hospitals might channel their efforts to improve mortality.

- **Admission rate**: This year's NHFA is based on 74,696 admissions to hospitals in England and Wales between April 2018 and March 2019. This is a 21% increase on last year's report and represents 89% of admissions coded as heart failure as the patient's primary diagnosis in hospital episode statistics in England and Wales. This increase in submissions is huge and highlights the problem for the NHS of the increasing prevalence of HF. However, it is reassuring that the audit is capturing a very large proportion of the admissions and is therefore well placed to comment on the quality of care that is being delivered.

- **Diagnostic tests**: During hospital admission, 87% of patients received an echocardiogram, a key diagnostic test. However, rates are higher for those admitted to Cardiology (94%) rather than General Medical (83%) wards. Specialist input, irrespective of the place of admission is associated with higher rates (91%) of echocardiography. There is, however, considerable variation in the use of this essential diagnostic tool across institutions leaving room for improvement.

- **Disease-modifying drugs**: The prescription of key disease-modifying medicines for patients with heart failure and reduced left ventricular ejection fraction (HFrEF) has continued to increase, including beta-blockers (BB) (90%) and mineralocorticoid antagonists (MRA) (55%); treatments that are both life-saving and inexpensive. As with other key performance indicators (KPIs), variations between wards and between hospitals are evident and most marked for mineralocorticoid antagonists.

- **Specialist input/care**: The number of patients seen by HF specialists has remained at 82%. It has increased slightly to 67% for those on medical wards. This is important as specialist care improves survival. Further efforts have to be made to improve specialist reach into general wards.

  Irrespective of the place of admission, 50% of patients with HFrEF seen by a member of the specialist HF team as an in-patient, were prescribed all three disease-modifying drugs. This progress has been maintained (it was 47% in 2016/17).

  The prescription rate for all three key disease-modifying medications for patients with HFrEF also remains stable at 55% for those admitted to Cardiology wards over the last three years. Admission to Cardiology wards is one of the KPIs with the most marked variation between institutions and has to be a target for improvement.

- **In-patient mortality**: There has been an absolute reduction in mortality during hospitalisation from 10.4% to 9.1% (12.5% relative risk reduction). This hopefully does reflect the effort of the audit over the last 14 years to change care for acute HF. Continued focus on our quality improvements (QIs) of specialist and cardiology care, alongside variation between the extent to which different hospitals deliver their care, should lead to further improvement. Those admitted to cardiology wards had an in-patient mortality of 6.7% and those who saw specialists (no matter where they were) had an 8.0% mortality rate in hospital. Out-reach specialist care and/or an increase in access to cardiology or specialist HF beds should be further promoted.

- **Post discharge mortality**: There has also been a reduction in post discharge mortality at 30 days (from 16.3% to 14.9%), and at 1 year from 33.2% to 31.8%. Post discharge mortality rates at one year are independently associated with and are substantially, and significantly, lower for those admitted to cardiology wards, those accessing cardiology follow-up, those being offered cardiac rehabilitation and those being discharged on the key disease-modifying medicines for HFrEF.

  Future efforts of the audit will continue to focus on these areas and try to reduce 1-year mortality rates for HFrEF by trying to drive up these key KPIs. We are beginning to see the fruits of this; the 1-year mortality rate for HFrEF was 29.1% having been 31.6% last year.

- **Hospital variance**: While this year's audit has seen an overall improvement in many of the KPIs, there is substantial variation between individual hospitals in the attainment of all the KPIs. The most marked variation is seen with the prescription of all three disease-modifying drugs for those discharged with HFrEF. This varies from less than 10% to 100% (in those in whom contraindications to the drugs have been excluded). We need to highlight and explore the variation between hospitals, then use any opportunities to help those lower performing units to catch up with the best hospitals.

In summary, for the key performance indicators (KPIs) in this audit cycle:

- Application of the gold standard diagnostic test, echocardiography, remains acceptable but the inter-hospital and ward-based variation, while it has improved slightly, needs further improvement.

- Prescribing rates of key disease-modifying medicines for those with HFrEF have continued to increase. However less than 50% of eligible HFrEF patients go home on all three drugs. Again, there is marked variation by place of care and hospital.

- The proportion of patients admitted to cardiology wards is static at <50% and leaves scope for improvement in many hospitals.
- The proportion of patients who have input from a HF specialist has remained at >80%. It needs to rise further if mortality is to be further reduced.
- In-patient mortality has improved, but it is still lower for those admitted to cardiology wards and for those who access specialist care.
- 1-year mortality has also improved but is significantly lower for those having cardiology follow-up, HF nurse input, and cardiac rehabilitation.
- 1-year mortality rates for HFrEF continue to be substantially lower for those discharged on all three disease-modifying drugs.

1. INTRODUCTION

The National Heart Failure Audit (NHFA) deals with a specific and crucial phase in the trajectory of patients with Heart Failure (HF). It reports on the characteristics of patients requiring admission to hospital with HF. It describes their in-hospital investigation, treatment, and their access to specialist care, and also deals with discharge planning and the follow-up and treatment which are offered.

The purpose of the audit is to drive up standards of care during this acute admission phase to achieve better patient outcomes. This is accomplished by capturing data on clinical indicators that have a proven link to improved outcomes in clinical trials, encouraging the increased use of diagnostic tools and disease-modifying treatments recommended in National and International Clinical Practice Guidelines and Quality Standards, and by following robust referral pathways.[1-5]

For a general introduction to HF and the Audit Methodology see Appendices A and B here.

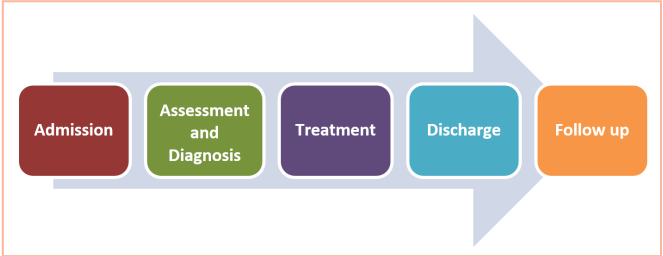
We report important clinical indicator data on over 70% of admissions with a primary diagnosis of HF in England and Wales. We seek to demonstrate quality improvement at the 'national' level in two ways. Firstly, by reporting trends of the key performance indicators (KPIs) and outcomes compared to previous years on aggregate data, and secondly by reporting hospital variation in achieving agreed benchmarks for our KPIs.

We encourage hospitals to aim to achieve the following Key Performance Indicator (KPI) targets:

- 70% case ascertainment
- >85% specialist team input during admission
- ≥60% patients being admitted to cardiology care
- >85% HF with reduced left ventricular ejection fraction (HFrEF) on discharge on all 3 disease-modifying drugs
- >50% to have 2-week follow-up appointments.

The results in this report, based on data for 2018/19, are presented according to the patient journey for people hospitalised because of HF [Figure 1].

Figure 1: *The patient pathway for a typical patient entered into the National Heart Failure Audit*



1.1 NUMBER OF PATIENTS IN THE AUDIT

Reporting on demographics and case ascertainment is important in demonstrating the validity of the audit. The audit has to ensure a robust sample size on which to describe trends, confirm that the cohort described reflects the true epidemiological picture of patients hospitalised for HF, and mitigate against hospitals selectively reporting their best data.

Data were provided on 74,696 hospital admissions with acute heart failure who either died as in-patients or who survived to discharge between April 2018 and March 2019 [Table 1]. This is a 21% increase on the confirmed numbers included in the 2017/18 report (58,885 confirmed cases). This represents 89% of HES/PEDW coded admissions with heart failure in the first diagnostic position. Records were submitted on 85,287 admissions, an increase of 20% on last year's total of 68,266.

This is the highest ever submission rate in an audit cycle. The data, therefore, give a very accurate picture of hospitalised HF patients in England and Wales. The explanation for the increase relates to greater familiarity with the more stringent data quality control introduced with the new IT platform two years ago.

Table 1: *Records submitted and case ascertainment (2018/19)*

Region	Records submitted	Confirmed HF records	HES/PEDW	Ascertainment (%)
Ascertainment (%)	85,287	74,696	95,626	89.2
England	81,423	71,188	90,916	89.6
Wales	3,864	3,508	4,710	82.0

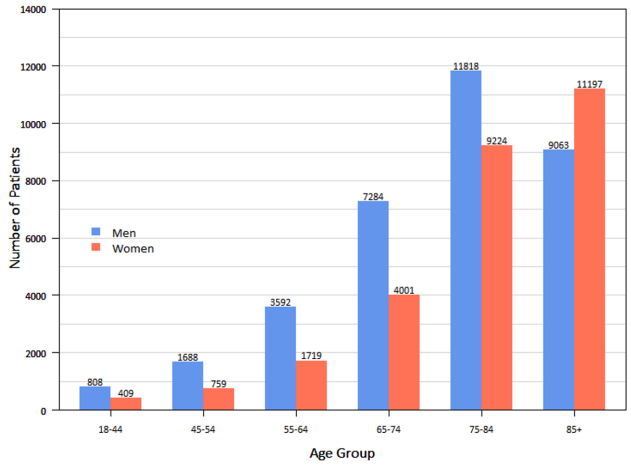
1.2 DEMOGRAPHICS

The age spread in the audit data is as follows:

- Mean age - 78 years
- Median age - 81 years
- Mean age men - 76.1 years
- Mean age women - 80.4 years

The median age of patients was one year higher than last year. This reflects a trend over the last few years and is entirely consistent with the increasing prevalence of HF in the elderly. There were more men in each age category other than the 85+ age group where women were in the majority [Figure 2].

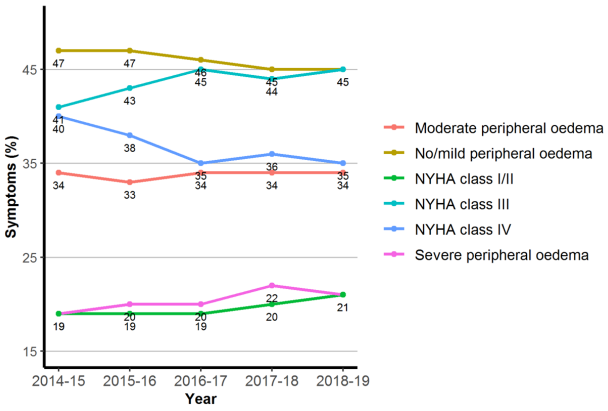
Figure 2: *Age and sex demographics at first admission (2018/19)*



1.3 TRENDS IN SYMPTOMS

The pattern of symptoms and signs of HF remains indicative of an advanced HF population. Thirty five percent of admissions were associated with symptoms at rest (NYHA Class IV) and 78% are either in NHYA Classes III or IV [Figure 3]. Over half of admissions (56%) were associated with moderate or severe oedema. These data are reflected in the poor outcomes that we see and confirm that hospitals are not selecting patients with milder disease for entry.

Figure 3: *Trends in symptoms and signs of HF over the last 5 years (2014/15 to 2018/19)*



1.4 TYPE OF LV DYSFUNCTION, CAUSES AND COMORBIDITIES OF HEART FAILURE

Echocardiography provides very important information on the type of HF and its underlying aetiology. Again, this year, very few patients have a normal echo (1%) due to stricter quality control than in previous audit cycles [Table 2]. Those with a normal echocardiogram were excluded unless they had atrial fibrillation recorded.

Most patients have HFrEF (64%), although this is slightly lower than the 66% reported last year. The declining proportion of HFrEF is important as it remains the only type of heart failure with therapy that alters the natural history of the disease. This will translate into our outcome data over time as the older, more comorbid population with HFpEF will increasingly impact on the overall outcomes.

The proportions of those with left ventricular hypertrophy (LVH), diastolic dysfunction and valve disease have remained unchanged since last year [Table 3].

As in previous years, ischaemic heart disease (IHD) is more common in those with HFrEF, whereas hypertension and valve disease are associated with HFpEF.

Of note is the consistently high co-morbidity burden; one third of patients have diabetes and almost 20% have chronic obstructive pulmonary disease. A further 10% are recorded as having asthma.

Table 2: *Overall echo diagnosis breakdown (2018/19)*

Assessment and Diagnosis	Total (%)
Normal Echo	1.0
Left ventricular systolic dysfunction (LVSD)	63.9
Left ventricular hypertrophy (LVH)	6.8
Valve disease	41.5
Diastolic dysfunction	12.0
Other diagnosis	19.4

Table 3: *Causes and comorbidities of Heart Failure (2018/19)*

Medical History	HFrEF (%)	HFpEF (%)
IHD	46	36
Atrial fibrillation (from ECG)	41	50
Valve disease	28	35
Hypertension	52	60
Diabetes	34	34
COPD	17	19
Asthma	9.1	9.6

1.5 MORTALITY

Good specialist HF care can reduce mortality in HF, most especially in HFrEF. Appropriate drug therapy for HFrEF improves 1-year post discharge mortality rates. To reflect the entire HF journey we report on in-patient mortality (reflects the quality of in-patient care), 30-day mortality (reflects the quality of discharge planning and transitional care) and 1-year mortality (reflects the follow-up care and drug therapy for HFrEF).

In-hospital mortality this year was lower at 9.1% from 10.1% last year. Mortality varies with age, being 5.4% for those <75yrs and 10.9% for those ≥75yrs. As in previous years, mortality is lower for patients admitted to cardiology (6.7%) compared to general medical (9.3%) wards and for those accessing specialist care (8.0%) compared to those who do not (13.2%) as in Figure 4.

Figure 4: *In-hospital mortality, 2018/19*

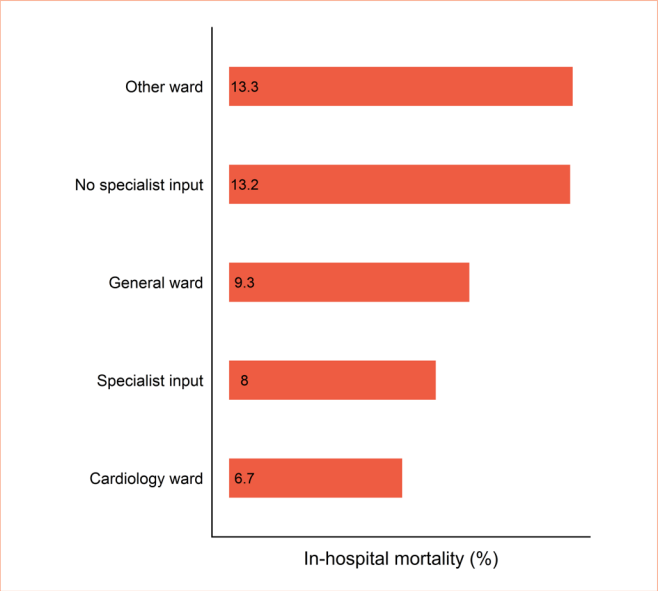
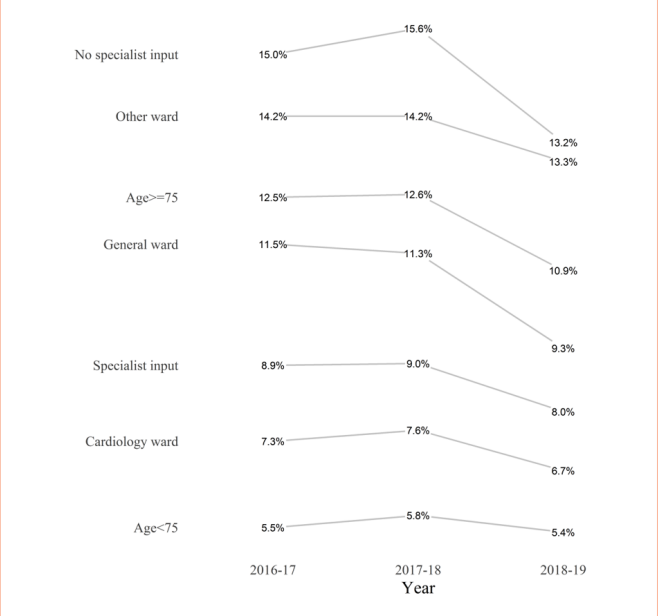


Figure 5: *Three-year trends of in-hospital mortality by specialist care, age and ward allocation (2016/17 to 2018/19)*



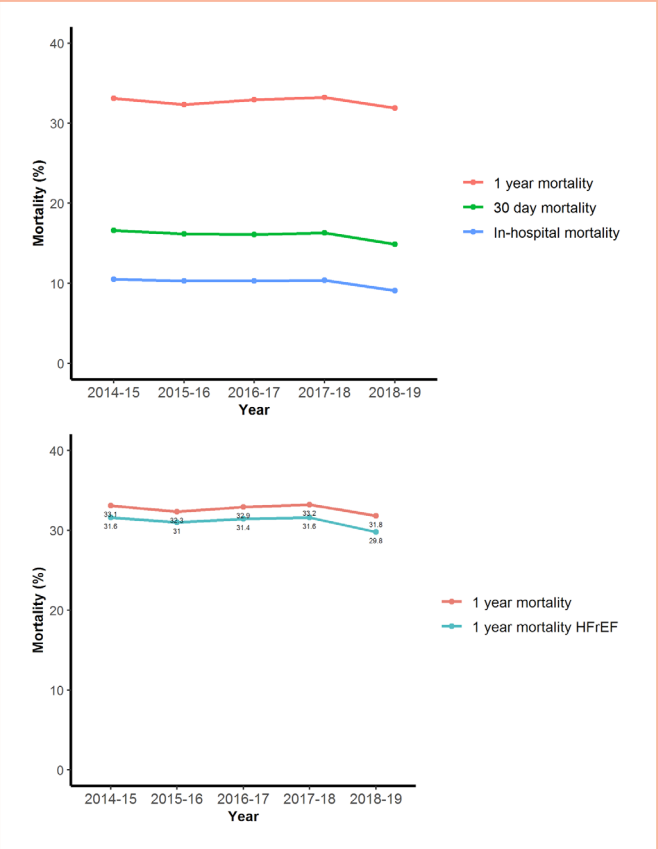
There is great variation in mortality rates between hospitals. This may be due to differences in patient characteristics and variations in care. A risk-adjustment model has been derived using data from the audit from its inception. This will be validated in this year's audit data. Once the risk-adjustment model is robust, funnel plot analyses will be carried out to detect outliers for mortality.

In-patient, 30-day and 1-year mortality rates, which had been fairly unchanged over the last four years, did fall this year [Figure 6]. This is despite the population becoming older and an increase

in the submission rates. Clearly, the aim has to be to continue to drive improvements in the years to come.

The high rates of mortality, compared to clinical trial series of patients with HF, can be explained by the large, comprehensive and representative nature of the audit, which includes all patients admitted with HF, dominated by an elderly, co-morbid population, including those with HFpEF as well as HFrEF, who have a high in-patient mortality.

Figure 6: *Five-year trend of in-hospital mortality, 30-day and 1-year mortality from admission (2014/15 to 2018/19)*



As we have had no new treatments for acute heart failure for over 20 years and no disease-modifying treatments for HFpEF, it could be argued that the high mortality seen is not surprising and not modifiable. However, the variation in in-patient mortality by place of care and specialist input might suggest otherwise and underscores the need to strive for comprehensive, state-of-the-art multidisciplinary heart failure care in all wards and hospitals as it is associated with better outcomes.

In addition, higher quality of in-patient care is associated with lower longer-term mortality. Hence in the future the audit will focus more on one-year mortality as a quality improvement target, particularly for those discharged with HFrEF. This is the first year we have reported this with a favourable start; it was 29.8%, a fall from 31.6% the year before.

In multivariable analyses adjusted for age, not being admitted to a cardiology ward (HR 1.67, p<0.001) continues to be an independent predictor of worse survival when other common markers of disease severity are included in the model (see Cox proportional hazards Table in Appendix 3 for in-hospital mortality and Appendix 4 for 30-day mortality).

The mortality rate at one year was 32% of people admitted with HF [Figure 7]. As in previous years, mortality at 1 year was lower for patients admitted to cardiology wards at 25% [Figure 8]. Similarly, mortality at 1 year of follow-up was lower for those having cardiology follow-up at 23% (compared with 39% without) [Figure 9] and for those seen by HF nurses (29% compared with 35% for no nurse follow-up) [Figure 10]. Referral to cardiac rehabilitation is also associated with a better outcome at one year, 21% compared to 32% for those not referred for rehabilitation [Figure 11]. This presumably reflects a selection bias for those being offered rehabilitation.

Figure 7: *Kaplan Meier plot of all-cause mortality following discharge from hospital (2018/19))*

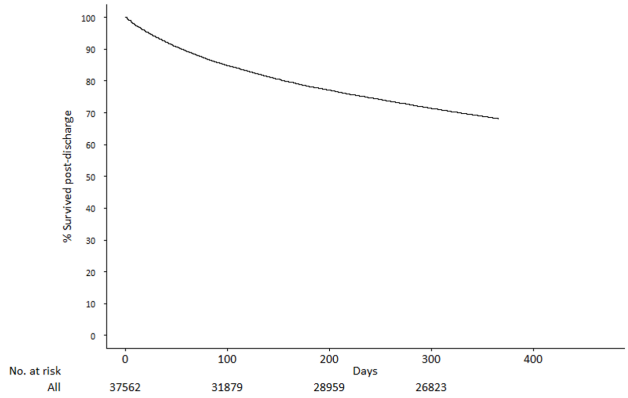


Figure 8: *Kaplan Meier plot of all-cause mortality following discharge from hospital according to place of care during the admission (2018/19)*

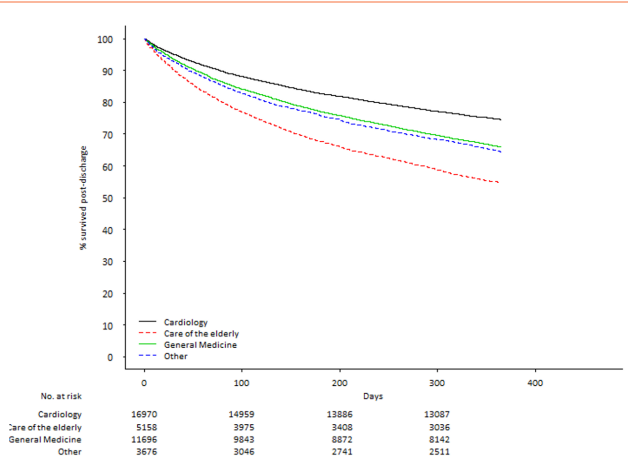


Figure 9: *One-year mortality according to cardiology follow-up (2018/19)*

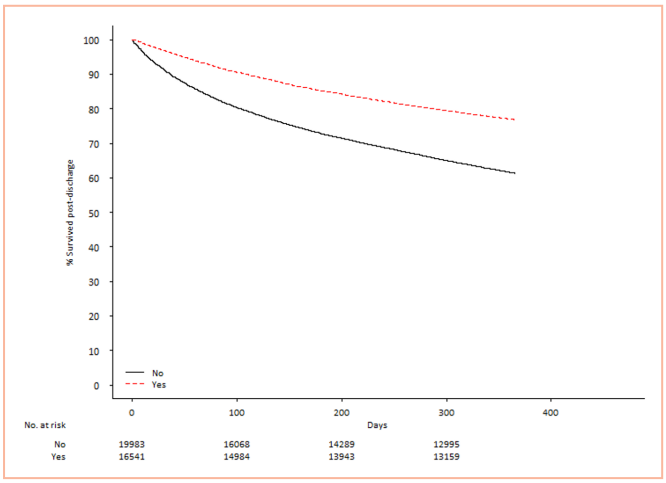


Figure 10: *One-year mortality according to HF nurse follow-up (2018/19)*

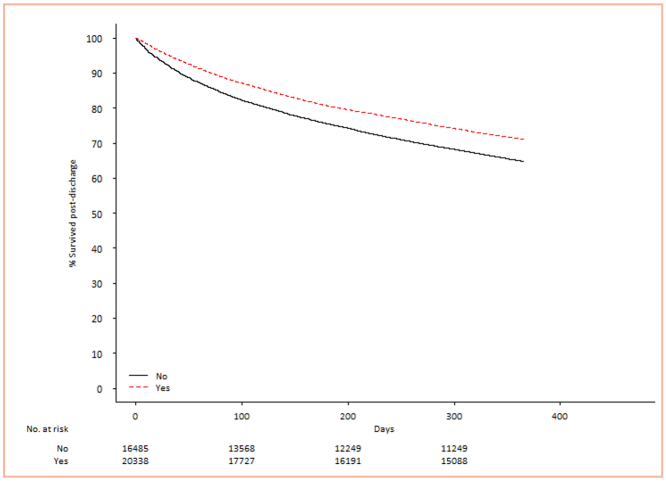
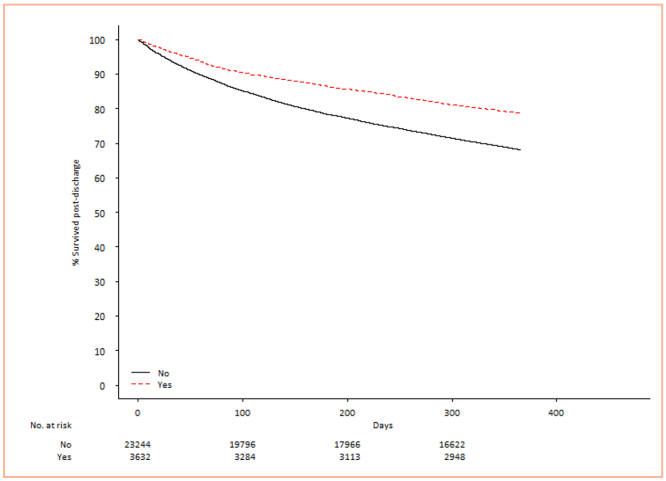
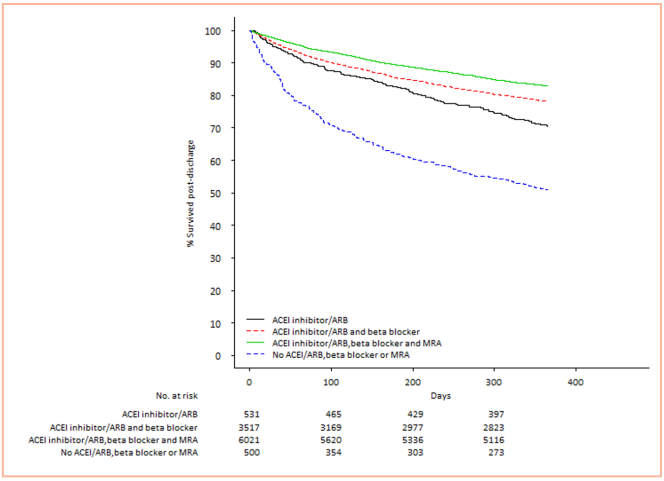


Figure 11: *One-Year mortality stratified by referral to cardiac rehabilitation (2018/19)*



Mortality post-discharge is highly dependent upon the prescribing of each of three disease-modifying drugs, with the greatest cumulative benefit seen in those who leave hospital on all three key disease-modifying drugs [Figure 12].

Figure 12: *Mortality post-discharge associated with prescribing for patients with HFrEF (2018/19)*



Those discharged on all three disease-modifying drugs had a 1-year mortality rate of 17% compared to 50% for those leaving hospital without any of the three key drugs.

The Cox proportional hazards Model for 1-year mortality is shown in Appendix 5. Not being a cardiology in-patient, not having cardiology follow-up and not being on an ACEI/ARB or a beta-blocker are all independent predictors of worse 1-year mortality. This appendix is available online here.

We also report, for the first time, the mortality rates for those discharged from hospital with a length of stay (LOS) of less than 1 day. At 30-days and 1-year the mortality rates were 3.9% and 21.9%, respectively. This does reflect that they are a lower-risk group than those who are admitted for more than 24 hours. However, they still have poor outcomes. Hospitals that are adopting this policy of ambulatory care should make sure that appropriate specialist follow-up is in place to ensure that these patients have the same access to specialist care and evidence-based therapy to improve their outcomes as those who are admitted for longer than 24 hours.

2. QUALITY IMPROVEMENT METRICS

2.1 THERE IS STILL ROOM FOR IMPROVEMENT IN THE USE OF ECG AND ECHOCARDIOGRAPHY FOR ASSESSMENT AND DIAGNOSIS

QI Metric Description/Name	Use of ECG and Echocardiography for assessment and diagnosis.
Why is this important?	Attempting a diagnosis of heart failure on clinical symptoms and signs alone will result in an incorrect diagnosis 50% of the time. An accurate diagnosis requires an investigation to confirm an underlying structural or functional abnormality of the heart (most commonly performed by echocardiography). An ECG is also important for risk stratification. It helps determine the cause of HF, its severity (heart rate/QRS duration) and is used to inform evidence-based treatments such as cardiac resynchronisation therapy (CRT) or anticoagulation for atrial fibrillation.
QI theme	Effectiveness, Safety
What is the standard to be met?	There is no accepted national standard here. The NICE Acute Heart Failure Guideline recommends an ECG for all and mandates an echocardiogram for all new presentations of acute HF. Accepting that some patients may have had a recent ECG or echocardiogram, the national audit standard set is for at least 90% of patients to have undergone an ECG and 90% of patients to undergo echocardiography.
Key references to support the metric	NICE Clinical guideline [CG187]. Acute heart failure: diagnosis and management[3]
Numerator	Number of patients with a first admission with acute heart failure for whom an in-patient echocardiogram was performed
Denominator	Number of patients with a first admission with acute heart failure
Trend	Electrocardiograms (ECGs) and echocardiography are performed in 96% and 87% of patients respectively, in line with the key performance indicators (KPIs) for accurate diagnosis. There has been an increase in reporting this year of those having an ECG in hospital from 86% last year. Echocardiography rates are similar to those seen previously. High levels of echocardiography have been maintained over the last five years. However, 13% of patients are either not undergoing echocardiography in hospital and/or have no record of a recent echo within the last 12 months.

Figure 13: *HF patients receiving ECG and echocardiography diagnostic tests over five years (2014/15 to 2018/19)*

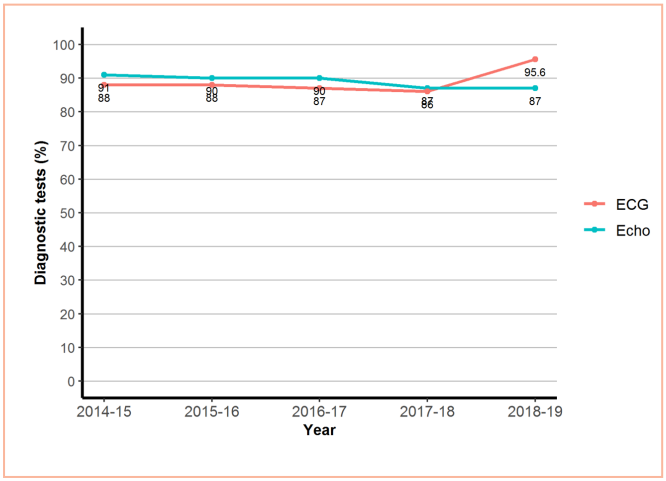
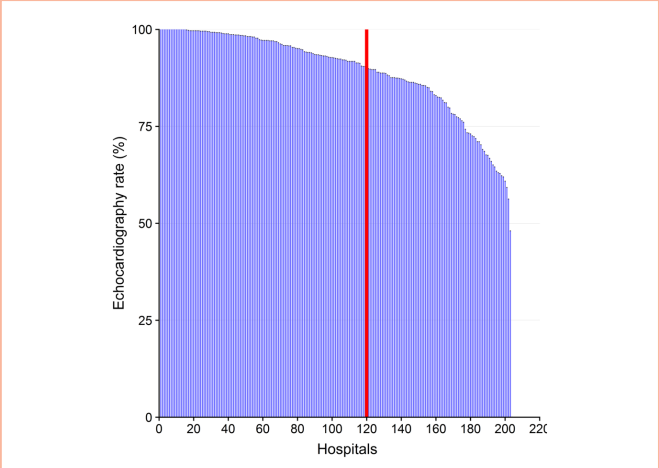


Figure 14 depicts the variation in the percentage of echocardiography achieved between hospitals. 120 (59%) hospitals achieved the national standard.

Figure 14: *Variation between hospitals by percentage undergoing echocardiography (2018/19)*



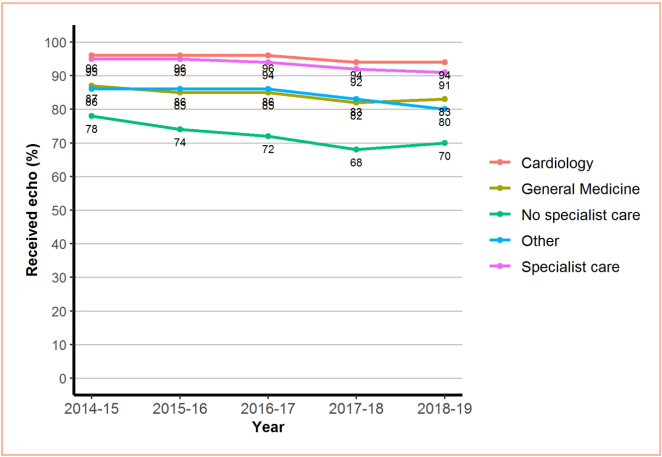
Hospitals to the right of the red line are not achieving the 90% of heart failure patients receiving echocardiography. Data from 204 hospitals; 1 hospital reporting <20 cases was excluded.

Patients admitted to cardiology wards were more likely to have echocardiography than those admitted to general medical wards

(94% versus 83%). However, it should be noted that patients receiving specialist input to their care, no matter where they are admitted, have similar rates of echocardiography (91%) as those on cardiology wards [Figure 15].

There is a substantial drop in the echocardiography rate for those not having access to specialist care (70%). Fifty-nine percent of hospitals achieved an echocardiography rate of 90% or more, an improvement of 1% from last year.

Figure 15: *Percentage of patients receiving echocardiography by place of care (or with specialist input regardless of the place of care) (2014/15 to 2018/19)*



The NICE Acute Heart Failure Quality Standard recommends the audit of number of patients with new heart failure and a raised BNP who have an in-patient echocardiogram. The NHFA has changed its dataset to allow for this and we will report on this when there are sufficient data to allow a meaningful analysis. Meanwhile individual hospitals should do their own internal audit against this standard.

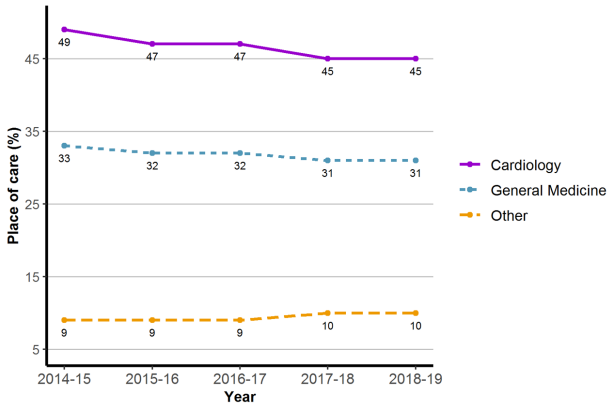
Recommendation for those not achieving the standard

Hospitals not achieving the recommended standard of the use of in-house echocardiography for patients with acute heart failure should review their clinical pathways and ensure that echocardiography is performed.

2.2 | MORE PATIENTS SHOULD BE ADMITTED TO A CARDIOLOGY WARD

QI Metric Description/Name	Place of care
Why is this important?	Place of care is a key quality indicator for HF as care in cardiology wards is associated with lower in-hospital and out-of-hospital mortality, better treatment for patients with HFrEF on discharge, and more access to specialist care.
QI theme	Effectiveness, Safety
What is the standard to be met?	There is no official standard. The NHFA has recommended improved access to Cardiology wards as it is associated with better outcomes.
Key references to support the metric	NICE Clinical guideline [CG 187]. Acute heart failure: diagnosis and management[3]
Numerator	All patients admitted with acute heart failure admitted to a cardiology ward
Denominator	All patients admitted with acute heart failure
Trend	In this audit cycle, as in the preceding five years, just under half of patients were admitted to cardiology wards. Whilst the low figure may reflect a fixed number of cardiology beds being available in most hospitals, there is an enormous variation within the audit in the percentage being treated in cardiology wards (0-100%).

Figure 16: *Trends in place of care over five years (2014/15 to 2018/19)*



Recommendation for those not achieving the standard

Hospitals should ensure that high-risk cardiac patients have access to cardiology wards.

2.3 | MORE PATIENTS ON GENERAL WARDS SHOULD BE SEEN BY A HF TEAM

QI Metric Description/Name	Access to specialist HF care
Why is this important?	Access to specialist HF care (by Cardiologists and Specialist HF nurses) is associated with lower in-hospital and out-of-hospital mortality, and better treatment of patients with HFrEF on discharge.
QI theme	Effectiveness, Safety
What is the standard to be met?	Accepting that some patients with HF may have multiple comorbidities and be more appropriately cared for by other physicians who might not ask for specialist care involvement, the audit standard is that at least 80% of patients admitted with acute heart failure should be seen by a member of the specialist heart failure team.
Key references to support the metric	NICE Clinical guideline [CG 187]. Acute heart failure: diagnosis and management[3]
Numerator	All patients admitted with acute heart failure who are seen by a member of the HF team
Denominator	All patients admitted with acute heart failure
Trend	Sixty-one per cent of hospitals achieved specialist review rates of over 80%. This is an increase of 2% since last year.

Eighty-two per cent of patients were seen by a HF specialist during the admission. This can either be a Consultant Cardiologist, another Consultant with specialist HF interest (usually a Care of the Elderly Physician) or a HF Specialist Nurse (some are seen by more than one member). Fifty-seven per cent of patients were seen by a Consultant Cardiologist and 49% of patients now see a HF Specialist Nurse during their admission.

For those on cardiology wards, 99% are seen by specialists, 94% are seen by a Consultant Cardiologist and 53% by HF nurses. Overall, 67% of patients on General Medical wards are seen by 'Any HF specialist'. The proportion of those seen by Specialist HF Nurses has increased by 1% in both Cardiology and General Medicine wards to 53% and 46%, respectively [Figure 17].

Specialist input is another KPI with huge inter-hospital variability and therefore with scope for improvement [Figure 18]. 124 (61%) hospitals achieved specialist review rates of over 80%. This is an improvement of 2% of hospitals since last year.

Figure 17: *Five-year specialist input trends by place of care (2014/15 to 2018/19)*

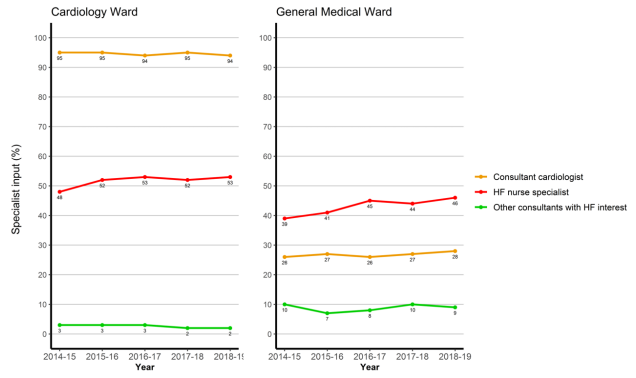
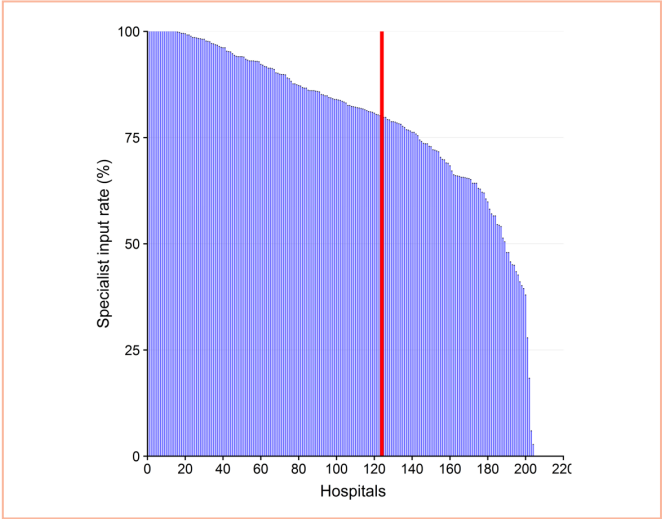


Figure 18: *Inter-hospital variation in percentage of HF patients seen by a specialist (2018/19)*



Hospitals to the right of the red line are not achieving the 80% of heart failure patients seen by a specialist. Data from 204 hospitals; 1 hospital reporting <20 cases was excluded.

Recommendation for those not achieving the standard

Hospitals not achieving the standards for ensuring a patient with acute heart failure is managed on a cardiology ward or seen by a heart failure team should review their pathways of care and consider a quality improvement programme to improve on their current performance.

Hospitals that do not have a Clinical Lead for Heart Failure should appoint one: ideally a Consultant Cardiologist.

Hospitals that do not have access to Specialist Heart Failure Nurses within their hospital team or in the community should urgently seek to appoint them.

2.4 | SHORT LENGTHS OF STAY MAY BE ASSOCIATED WITH HIGH READMISSION RATES

QI Metric Description/Name	Length of stay (LOS)
Why is this important?	LOS is a surrogate for quality of care as an in-patient. Very short LOS is associated with increased readmission rates for HF.
QI theme	Effectiveness
What is the standard to be met?	There is no standard for this measure but the data are provided for comparison with other hospitals and to show the national average.
Key references to support the metric	Not applicable
Numerator	All patients admitted with acute heart failure
Denominator	Not applicable
Trend	The median length of stay (LOS) in 2018/19 was 9 days for those admitted to cardiology wards and 6 days for those in general medicine, unchanged compared to the 2017/18 data. Those receiving specialist care also have a higher median LOS at 9 days compared to 5 days for patients not seeing specialists. Mean LOS does seem to be falling across all sectors of care. That is much less marked for patients in cardiology wards and those seeing specialists, but LOS is clearly becoming shorter for those in general medical wards and those not being reviewed by specialists. The longer length of stay for patients receiving specialist care will include referral of more severe cases for expert care, higher rates of implementation of disease-modifying therapies and greater care to ensure that the patient is stable prior to discharge.

Figure 19: *Five-year trend of mean length of stay based on place of care and specialist input (2014/15 to 2018/19)*

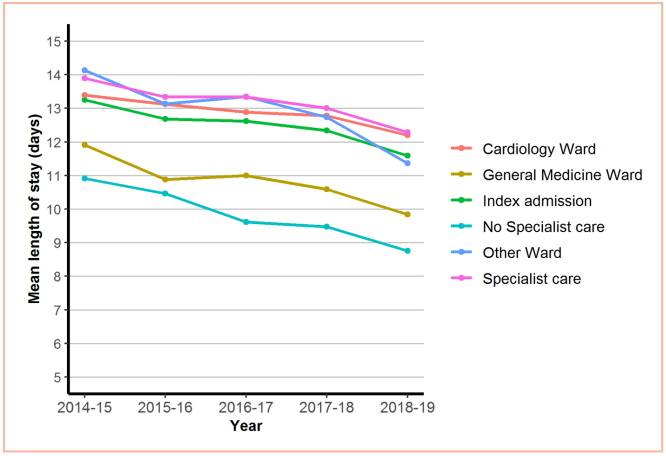
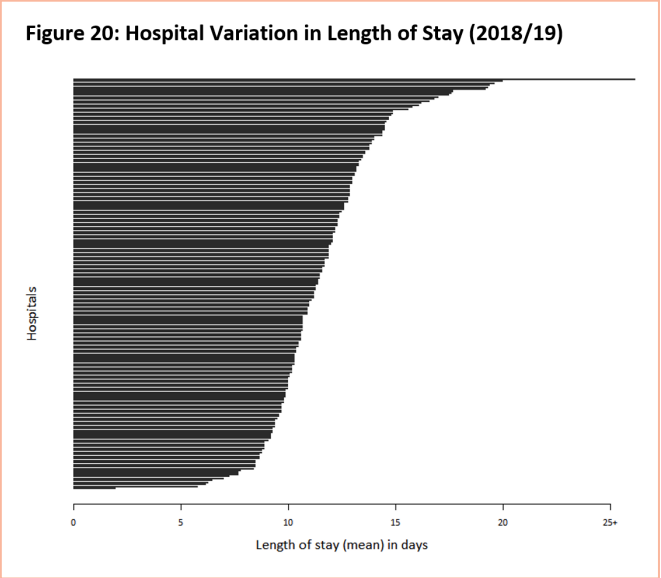


Figure 20: *Hospital Variation in Length of Stay (2018/19)*



Recommendation

Further research is required into the association between length of stay, severity of disease and outcomes, especially around the value of short periods of hospitalisation for initiation of care supported by community services

2.5 | BEST-PRACTICE TREATMENT AT DISCHARGE FOR HFrEF SHOULD BE FOLLOWED

QI Metric Description/Name	Best-practice treatment at discharge
Why is this important?	Prescription of ACEIs, beta-blockers and MRAs are key performance indicators for patients with HFrEF as these drugs are associated with better survival, lower hospitalisation rates and better quality of life.
QI theme	Effectiveness
What is the standard to be met?	All patients with HFrEF should be prescribed an ACEI, beta blocker and MRA unless contra-indicated
Key references to support the metric	NICE guideline [NG 106]. Chronic heart failure: diagnosis and management[1] NICE Clinical guideline [CG 187]. Acute heart failure: diagnosis and management[3]
Numerator	All patients with HFrEF prescribed each of these drug classes, unless there is a predetermined contraindication
Denominator	All patients admitted with HFrEF, excluding those with a contra-indication to treatment
Trend	This year high aggregate standards were again achieved with 84% of patients being discharged on an ACEI or angiotensin receptor blocker (ARB). Further improvements were seen compared to 2016/17 with 90% on beta-blockers and 55% on an MRA. However, arguably a more relevant and challenging target is the number discharged on all three medicines, which has increased only slightly to 48%, from 47% last year. Prescription of diuretics has remained static and digoxin use has now reduced to 21%.

Table 4: *Treatment on discharge for HFrEF (2018/19)*

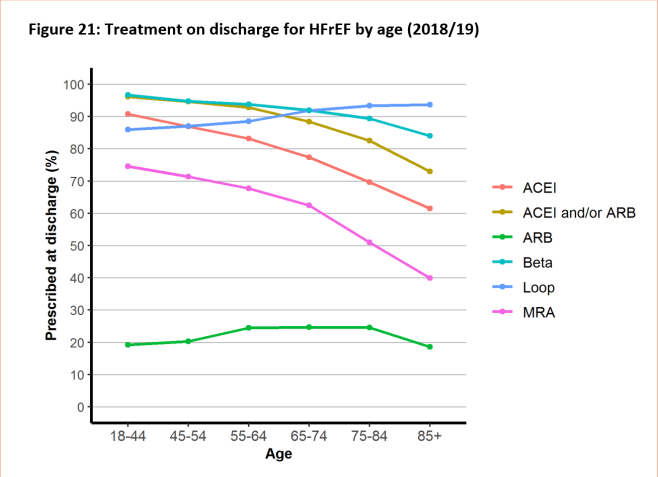
Medication	Total prescribed (%)
ACE inhibitor	73
ARB	23
ACE or ARB	84
Beta blocker	90
MRA	55
ACEI or ARB, Beta blocker and MRA	48
Loop diuretic	92
Thiazide diuretic	5
Digoxin	21

The differential prescribing of disease-modifying treatment with an ACEI/ARB, BB and MRA with age was also seen again this year [Figure 21]. The inflexion point for reduction in these drugs is in the 55-64 age group. The problem is greatest for MRA use. This is an area for targeting better practice in the next few years.

The trends in prescribing of the three key medicines over the last 5 years are either maintained or improving; in particular the prescription of beta-blockers has improved markedly with a discharge prescription rate of 90%. MRAs are now prescribed to >50% of patients [see Figure 22]. Some would argue that this could be higher; however, prescription rates of MRAs and the other key drugs are compatible with contemporary clinical trial data and are superior to other registries. The data presented in this audit are for patients eligible for these therapies (i.e. after those with contraindications have been removed). One could therefore argue that the rates of prescriptions for all three drugs should be approaching 100%.

We have set QI targets for prescription of ACEI/ARB and BB at ≥90% and at 60% for MRAs. The inter-hospital variation in percentage prescription of these drugs demonstrates that many hospitals fall far short [Figures 23, 24, 25 and 26]. There was a fall from 49% to 46% achieving the ACEI/ARB target, and a fall from 62% to 56% in those achieving the BB benchmark. The proportion achieving the target for MRAs was similar at 50%. In particular, prescribing rates for the combination of all three drugs needs to improve in the in-patient setting (NICE AHF Guidelines 2014).[3] The proportion of hospitals reaching the 60% benchmark set last year has fallen from 42 to 41%.

Figure 21: *Treatment on discharge for HFrEF by age (2018/19)*



Angiotensin Converting Enzyme Inhibitor (ACEI); Angiotensin Receptor Blocker (ARB); Mineralocorticoid (aldosterone) Receptor Antagonist (MRA).

However, a mitigating factor here is possibly that we first applied these benchmarks to the 2017/18 data when the audit was published in late September 2019. We were already, at that point six months through the current cycle, so it may take another year to see a marked effect of ranking hospitals against this benchmark.

Figure 22: *Five-year trends in prescription of disease-modifying therapies for HFrEF (2014/15 to 2018/19)*

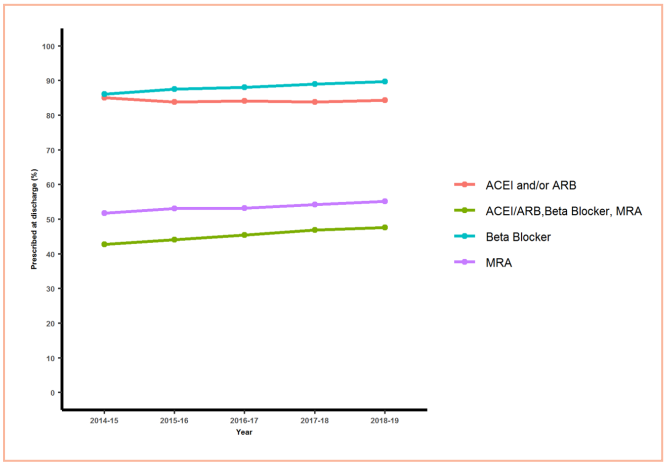
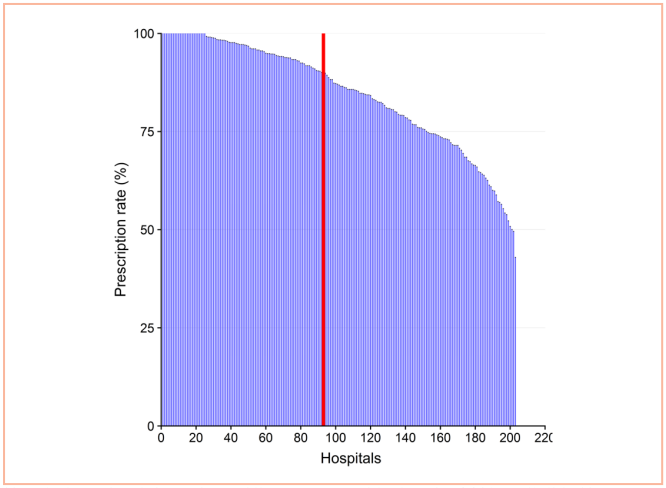
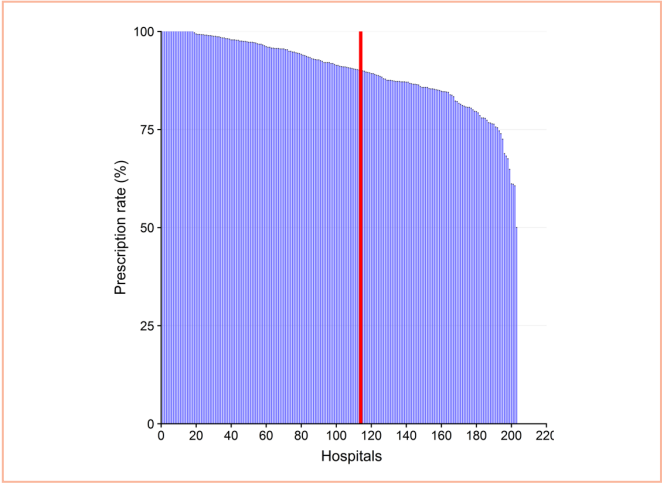


Figure 23: *Proportion of patients with HFrEF receiving an ACEI/ARB per Hospital (2018/19)*



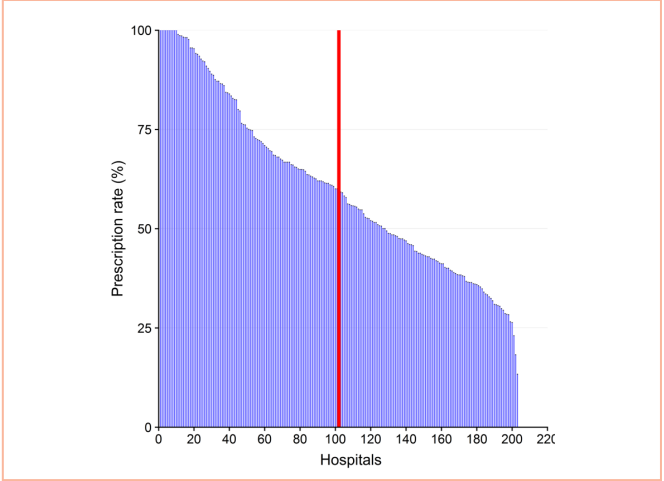
Hospitals to the right of the red line are not achieving the 90% of eligible HFrEF patients receiving an ACEI/ARB. 93 (46%) of hospitals achieved this. Data from 204 hospitals; 1 hospital reporting <20 cases was excluded.

Figure 24: *Proportion of patients with HFrEF receiving a beta-blocker per Hospital (2018/19)*



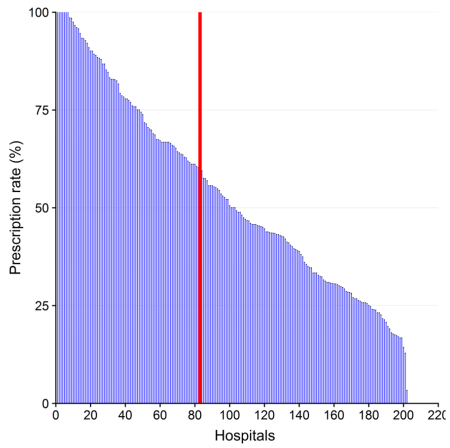
Hospitals to the right of the red line are not achieving the 90% of eligible HFrEF patients receiving a beta blocker. 114 (56%) of hospitals achieved the target. Data from 204 hospitals; 1 hospital reporting <20 cases was excluded.

Figure 25: *Proportion of patients with HFrEF receiving an MRA per Hospital (2018/19)*



Hospitals to the right of the red line are not achieving the 60% of eligible HFrEF patients receiving an MRA. 102 (50%) of hospitals achieved the target. Data from 204 hospitals; 1 hospital reporting <20 cases was excluded.

Figure 26: *Proportion of patients with HFrEF receiving all 3 drugs per Hospital (2018/19)*



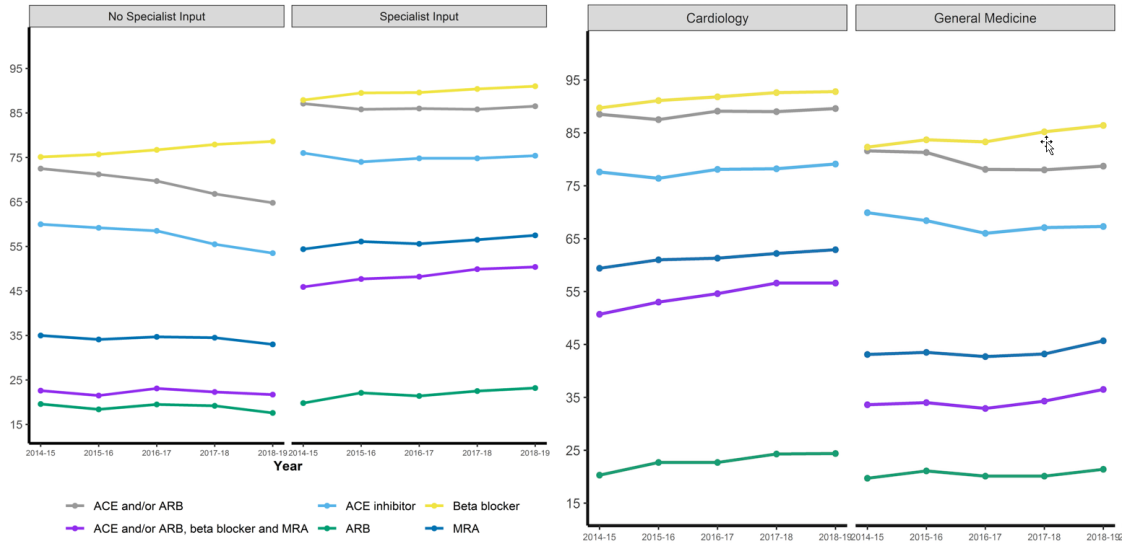
Hospitals to the right of the red line are not achieving the 60% of eligible HFrEF patients receiving all 3 disease-modifying drugs. 83 (41%) of hospitals achieved the target. Data from 204 hospitals; 1 hospital reporting <20 cases was excluded.

The trend seen over the last five years is for an increase in the prescription of BB, MRA and their combination in patients who have specialist input. Prescription rates for those who lack specialist input are largely static or falling.

The audit also found that specialist care increases appropriate drug prescription and more should be done to ensure that patients receive this. The rate of prescription of all three disease-modifying medicines in combination remains at 55% for the last two years on cardiology wards. It has gone up, modestly to 36% on general medical wards [Figure 27].

Last year, we reported that the proportion of patients prescribed all three medicines increased from 47% to 50% amongst those seen by a specialist. That level of prescribing has been maintained, whereas there has been no increase for patients not seen by a specialist, irrespective of their ward allocation. Thus, outreach services to other wards can improve care.

Figure 27: *Five-year trend of treatment of HFrEF on discharge by place of care and specialist input (2014/15 to 2018/19)*



Recommendation for those not achieving the standard

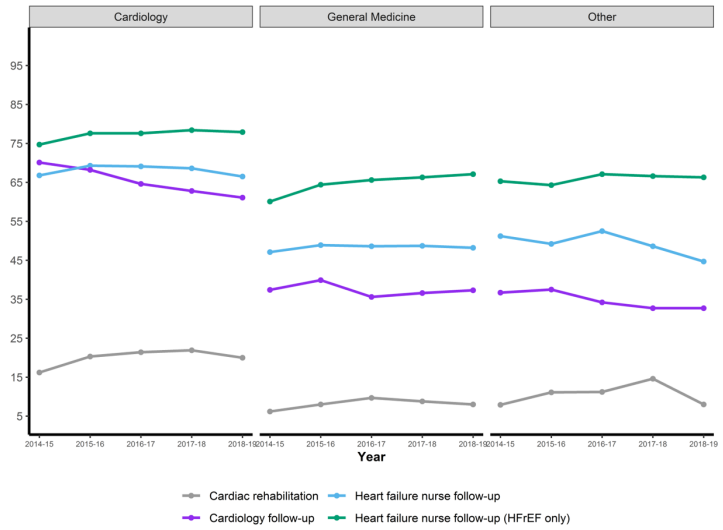
Greater attention is needed to ensure all patients with HFrEF receive the disease-modifying drugs that they should be on unless there is a contra-indication. This can be increased by patients being managed on cardiology wards or being seen by a HF specialist team. Those hospitals not meeting the expected standards should perform a clinical pathway review to investigate where improvements can be made.

2.6 MORE PATIENTS SHOULD BE OFFERED SPECIALIST FOLLOW-UP AND REHABILITATION

QI Metric Description/Name	Follow-up appointment within two weeks of discharge.	Specialist follow-up and access to cardiac rehabilitation.
Why is this important?	People admitted to hospital because of HF should be discharged only when stable and should receive a clinical assessment from a member of a multidisciplinary HF team within 2 weeks of discharge (NICE Quality standard 103). This is a 'high-risk' period, when the patient is at increased risk of hospital readmission and is in danger of falling between the 'two stools' of hospital and community care.	Specialist cardiology and HF nurse follow-up and access to cardiac rehabilitation improves morbidity and mortality in HF.
QI theme	Effectiveness.	Effectiveness.
What is the standard to be met?	The standard should be 100%.	The standard should be 100% of stable patients fit for discharge
Key references to support the metric	NICE Quality standard [QS 103]. Acute heart failure.[4]	NICE guideline [NG106] 2018. Chronic heart failure in adults: diagnosis and management 2018.[1]
Numerator	All patients discharged alive after an admission with acute heart failure with evidence of an early follow-up appointment	All patients discharged alive after an admission with acute heart failure referred as an in-patient to cardiac rehabilitation
Denominator	All patients discharged alive after admission with acute heart failure	All patients discharged alive after admission with acute heart failure
Trend	This metric has improved in 2018/19 with 41% of patients (37% last year) recorded as having the follow-up appointment in place at discharge.	Overall 45% of those discharged have cardiology follow-up, and 55% have HF Specialist Nurse appointments post discharge. These rates are higher for those being discharged from cardiology wards at 64% and 66% respectively. Trends for both cardiology and HF nurse follow-up are largely static. This is a key area for future improvement as such follow-up has been demonstrated repeatedly by this audit to be associated with improved outcomes. Overall, 13.3% of patients are referred for cardiac rehabilitation during hospitalization. Rates are higher for those cared for in cardiology wards (21%) compared to 9% for those seen on general medical wards. Many more are purportedly referred after discharge by community teams, however, the audit does not capture this.

The variation is enormous between hospitals (0% to 100%) and requires further investigation regarding referral practice and barriers to HF patients in rehab programmes including age, frailty and comorbidity. In addition, in this and previous audit cycles, there was no facility to record those declining the offer of rehabilitation. The revised dataset for 2020/21 addresses this.

Figure 28: *Trends in multidisciplinary HF team follow-up post discharge (2014/15 to 2018/19)*



Recommendation for those not achieving the standards

More attention to follow-up arrangements is required so that patients are referred for Cardiology and Specialist Heart Failure Nurse follow-up, if required. Hospitals should review their pathways for referral to cardiac rehabilitation to allow great access and uptake for heart failure patients.

3. FUTURE DIRECTION

3.1 IMPROVING DATA QUALITY AND COMPLETENESS

We will continue to use the audit data to highlight the importance of cardiology care and access to specialist heart failure care to drive down in-patient mortality rates. A new dataset is being implemented in the next audit cycle to reflect new advances in HF care. The incorporation of the new data completeness tool will further improve the data quality.

3.2 IDENTIFYING AND UNDERSTANDING VARIANCE

In future years there will be increasing Identification of those units that are not meeting the QI targets and the subsequent impact on outcome using risk-adjusted statistics. This should improve both in-patient quality of care and mortality alongside the outcomes at 1 year and 'specifically' mortality for patients with HFrEF, where there is strong evidence that leaving hospital on disease-modifying treatments improves outcomes. Addressing the huge variation between hospitals in drug prescribing at discharge is a priority, alongside early specialist follow-up.

One of the tasks of the audit for next year will be to try to understand these variations in greater detail, which will involve a more interactive approach. We will be contacting hospitals with apparently unusual results to try to find out why and to try and help discover what makes best practice. Next year's report will carry a greater exploration of variation between different sites and examples of successes from which we can all learn.

The poor uptake of cardiac rehabilitation will also remain a key QI target in future cycles.

3.3 LENGTH OF STAY <24 HOURS

As we have now excluded patients being admitted for less than 24 hours (to ambulatory care units/other non-admission beds) from the QI part of this audit (as they do not stay long enough for optimising care or having specialist assessment, but are coded in HES), we will continue to track their 1-year mortality to ascertain whether this practice is safe in the longer term.

3.4 NEXT STEPS

As the audit matures, it is becoming obvious that there are some anomalies in the data that we need to explore further. A particular concern is the wide variation in some procedural measures, such as length of hospital stay, and some clinical measures, such as the proportion of patients leaving hospital taking each of the main categories of disease-modifying drugs.

The object of the audit has always been to be a tool to help drive up the quality of care for patients admitted to hospital with heart failure. We hope it can be used by everyone who contributes to the audit so that local data can be used in discussion with management to help increase resources, and to show management how well the local team is doing.

REFERENCES

1. NICE guideline [NG 106] 2018. Chronic heart failure in adults: diagnosis and management
2. NICE Quality standard [QS9] 2011. Chronic heart failure in adults
3. NICE Clinical guideline [CG187] 2014. Acute heart failure: diagnosis and management
4. NICE Quality standard [QS103] 2015. Acute heart failure
5. 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC) Developed with the special contribution of the Heart Failure Association (HFA) of the ESC

THANKS AND ACKNOWLEDGEMENTS

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Data extraction and linkage was carried out by the NICOR Informatics team. Data cleaning and analysis was performed by Aminat Shote.

The National Heart Failure Audit is managed by NICOR, which is part of NCAPOP, based at Bart's Health NHS Trust.

Specialist clinical knowledge and leadership is provided by the BSH and the audit's clinical lead, Professor Theresa McDonagh. The strategic direction and development of the audit is determined by the Domain Expert Group. This includes major stakeholders in the audit, including Cardiologists, the BSH, Heart Failure Specialist Nurses, Clinical Audit and Effectiveness Managers, patients, NICOR Developers and HQIP.

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.

NATIONAL INSTITUTE FOR CARDIOVASCULAR OUTCOMES RESEARCH (NICOR)

NICOR is a partnership of clinicians, IT experts, statisticians, academics and managers who, together, are responsible for six cardiovascular clinical audits (the National Cardiac Audit Programme – NCAP) and a number of new health technology registries, including the UK TAVI registry. Hosted by Barts Health NHS Trust, NICOR collects, analyses and interprets vital cardiovascular data into relevant and meaningful information to promote sustainable improvements in patient well-being, safety and outcomes. It is commissioned by the Healthcare Quality Improvement Partnership (HQIP) with funding from NHS England and the Welsh Government and, for four of the domains, from the Scottish Government. Funding has been sought to aid the participation of hospitals in Northern Ireland, the Republic of Ireland and the private sector.
Email: nicor.auditenquiries@nhs.net

BRITISH SOCIETY FOR HEART FAILURE (BSH)

The 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.

BARTS HEALTH NHS TRUST

With a turnover of £1.5 billion and a workforce of around 17,000 people, Barts Health is a leading healthcare provider in Britain and one of the largest NHS Trusts in the country. The Trust's five hospitals – St Bartholomew's Hospital in the City, The Royal London Hospital in Whitechapel, Newham Hospital in Plaistow, Whipps Cross Hospital in Leytonstone and Mile End Hospital – deliver high quality compassionate care to the 2.5 million people of east London and beyond.

THE HEALTHCARE QUALITY IMPROVEMENT PARTNERSHIP (HQIP)

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 in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies.
www.hqip.org.uk/national-programmes

This report is available online at:
https://www.nicor.org.uk/national-cardiac-audit-programme/heart-failure-heart-failure-audit/

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