MANCHESTER 1824
The University of Manchester

NHS
National Institute for Health Research
Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for Greater Manchester

# GM-HFIT

## (Greater Manchester Heart Failure Investigation Tool)

Primary Care Heart Failure Improvement Project Evaluation Report
NHS Bury Clinical Commissioning Group

NIHR CLAHRC for Greater Manchester
January 2014
Katy Rothwell

# Acknowledgements

The improvement project reported here would not have been possible without the assistance and support of a great number of people. The GM CLAHRC would particularly like to offer their thanks to the Fin McCall, Dr Kiran Patel and members of the NHS Bury/NHS Bury CCG Chronic Disease Management Group for their leadership, guidance and ongoing support over the course of the project. This project required a high level of engagement across the NHS Bury CCG area and this would simply not have been possible without their input. We are also grateful to the Bury Heart Failure Specialist Nurses, Bernadette Spanner, Jane Boardman and Kieley Lewthwaite for the invaluable contribution they made, particularly for their involvement in the delivery of clinical education sessions that formed a core component of this piece of work. Finally, we would like to extend our thanks to all of the staff, both clinical and administrative, from the GP practices involved for their engagement and participation over the course of the project.

# Executive Summary

This report has been prepared by the NIHR Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for Greater Manchester. It provides the evaluation findings and result of the Greater Manchester Heart Failure Investigation Tool (GM-HFIT) primary care improvement project, a piece of work conducted by the GM CLAHRC in collaboration with NHS Bury Clinical Commissioning Group (CCG).

The GM-HFIT project was established in January 2012 and involved 28 GP practices from across NHS Bury CCG. Run over a two year period, the project aimed to improve the quality of service and care for people with heart failure (HF) across the local area. The evaluation findings and results presented here were collected as part of a reaudit exercise conducted between July and November 2013. Results are given for 27 of the 28 practices that participated in the project.

**The GM-HFIT Improvement Project**

Heart failure is a complex and highly debilitating clinical syndrome that affects 530,000 people in England, equating to 1 to 2% of the adult population in England. Primary care teams in collaboration with specialist services, have an essential role to play in the ongoing management of these patients. Yet, data available at the start of the project suggested that HF was often both under- and mis-diagnosed in primary care and that the clinical management of these patients was frequently suboptimal. The GM-HFIT project was established in NHS Bury CCG to address these clear and important issues, building on a previous phase of the project undertaken in NHS Manchester.

The GM-HFIT project comprised a series of key interlinked activities. These activities were:

- *Verification of existing HF registers*: examination of practice held HF registers by a HF specialist nurse to identify patients who did not have a confirmed diagnosis of HF and therefore needed further investigation or removal from the HF register. Recommendations for future management were also made, as required, for all patients on the register.
- *Audit of HF management*: assessment of the clinical management of all patients on the HF register against a set of evidence-based key performance indicators. This generated a 'traffic light score' for each practice that provided an arbitrary measure of the overall quality of HF management.
- *Case finding HF patients*: searching of practices' clinical records for patients with confirmed, or suspected, diagnoses of HF that were not already on the HF register.
- *Feedback session and implementation period*: feedback of the verification, audit and case finding results to practices by a HF specialist nurse. This was supplemented by the provision of facilitation support and education for practices as required/requested.
- *Reaudit and feedback*: repetition of the verification and audit processes to detect changes in HF register validity and the quality of clinical management.

## Key Findings and Results

### *Heart failure prevalence and validity*

- Between baseline and reaudit the total number of patients on the HF registers of participating practices increased from 1087 (average, 40; range, 6 to 118) to 1538 (average, 57; range, 7 to 155). This represents an increase in average HF prevalence from 0.65% (range, 0.33 to 1.15%) to 0.92% (range, 0.26 to 1.54%). A prevalence increase was observed at 24 of the 27 participating GP practices.

- The case finding process identified a total of 625 patients across the practices with a confirmed HF diagnosis that required addition to the HF register. In addition, a further 77 patients were thought to require referral for echo, 67 required their echo report requesting, 21 were considered to warrant referral to specialist services and, on 362 occasions, practice GPs were asked to review individual patient cases.

- At the close of the project an improvement was observed in the validity of HF registers at all practices. At baseline, 71.1% (range, 47.1 to 92.3%) of patients were considered to be appropriately on the HF register, with 20.3% (range, 6.8 to 35.7%) considered to require further investigation and 8.6% (range, 0.0 to 25.0%) thought to be inappropriate and to warrant removal from the register. At reaudit the proportion of patients considered appropriate for the HF register had increased from 71.1 to 86.2% (range, 73 to 100%) and the proportion of patients considered to require further investigation or removal from the register had decreased from 20.3 to 8.4% (range, 0 to 19.0%) and 8.6 to 5.4% (range, 0 to 12.0%) respectively.

- Improvements in HF register validity were primarily attributable to the addition to the HF register of patients with a confirmed HF diagnosis that had been identified through the case finding process. However, a number of practices also proactively removed from the register patients who had been identified, at baseline, as being inappropriately on the register. At reaudit, however, it was apparent that approximately a quarter of 'new' patients diagnosed with HF since the baseline audit (and not identified through the case finding process) had been added to the HF register in the absence of a confirmed diagnosis, indicating that further work will be required if the observed improvements in HF register validity are to be maintained.

### *Quality of heart failure management*

- A seven point improvement in traffic light score was observed, on average across the practices, between the initial baseline audit and reaudit. An increase was observed at 19 of the 27 participating GP practices, with several observing minimal decreases. Increases in traffic light score were principally owing to improvements in the proportion of patients on the HF register with confirmed diagnoses and documented aetiology.

- With respect to clinical care, the principal improvement observed was in the proportion of patients on practice HF registers receiving, or documented as requiring, a primary care HF review either six monthly or annually. This increased from 6.3% at baseline to 22.1% at reaudit.

- The introduction of regular HF reviews supported small yet significant improvements, on average, in the proportion of HF patients having their pulse rate and rhythm, weight and oedema checked, their alcohol and smoking status recorded and receiving, or documented as receiving, education in relation to HF self management and nutritional

intake. A small yet significant decline, however, was observed in the average proportion of patients on the HF register with a recorded NYHA classification and the proportion of patients screened for depression, both within the previous 12 months.

- Between baseline and reaudit, on average across the practices, a small reduction in the appropriate use of ACEI/ARB and BB therapy for patients with confirmed LVSD was observed. The proportion of patients appropriately receiving an ACEI/ARB, or for whom it was documented as contraindicated, declined from 91.2 to 88.9%. This trend was observed at 15 of the participating practices. BB use also declined in the same way from 84.3 to 82.4%, with a decrease in appropriate use being observed at approximately half of all practices.

- In contrast to the observed reduction in appropriate ACEI/ARB and BB use, increases were observed in the proportion of patients treated with optimal doses of these therapies. On average, the proportion of patients receiving maximum tolerated dose of ACEI/ARB, or being up-titrated, increased from 79.6 to 84.2%. This trend was seen at 18 of the 27 participating practices. A similar increase was seen in the proportion of patients receiving maximum tolerated dose of BB therapy, or being up-titrated, increasing from 78.0% to 84.8%. This trend, however, as for ACEI/ARB therapy, was not consistent across the NHS CCG area, being observed at just over half of all practices.

**Recommendations**

The following high-level recommendations are provided regarding future work, in view of the evaluation results presented above, that is, or may be, required in NHS Bury CCG to maintain and build on the improvements made over the course of the GM-HFIT project.

- Recommendation 1: Further input and support should be considered across NHS Bury CCG to support the appropriate interpretation and Read coding of echocardiogram reports and the appropriate investigation of patients with signs and symptoms of HF prior to their addition to the register

- Recommendation 2: Development of a standardised protocol across NHS Bury CCG related to the management patients with suspected HF who are unable to access echocardiography services or who declined further investigation should be considered.

- Recommendation 3: Consistent with recommendation 1, further input and support should be provided across NHS Bury CCG to support the appropriate interpretation and Read coding of echocardiogram reports, discharge summaries and clinical letters. This should include information concerning the diagnosis and Read coding of diastolic HF and mild LVSD.

- Recommendation 4: Continue to pilot and refine the primary care HF review template with a view to supporting its roll-out across all of the GP practices that comprise NHS Bury CCG.

# 1. Introduction

**The Greater Manchester Heart Failure Investigation Tool (GM-HFIT) primary care improvement project was a piece of work established in partnership with NHS Bury/NHS Bury Clinical Commissioning Group (CCG) in January 2012 to improve the quality of service and care for people with heart failure (HF).**

Heart failure (HF) is a complex and highly debilitating clinical syndrome that affects over 530,000 people in England, equating to between 1% and 2% of the country's adult population (British Heart Foundation, 2010). Although the incidence and mortality rates associated with coronary heart disease (CHD), the main cause of HF, have declined over the past 20 years, the incidence and prevalence of HF continues to rise steadily, due, in part, to the ageing population and the increasing number of people surviving acute myocardial infarctions (National Institute for Cardiovascular Outcomes Research, 2012). The condition also poses a considerable economic burden, costing the NHS approximately £625 million per annum, and accounts for 2% of all NHS inpatient bed-days and 5% of all emergency medical admissions to hospital (Sutherland, 2010; National Institute for Health and Clinical Excellence, 2010).

Primary health care teams, in collaboration with specialist services, have an essential role to play in the ongoing management and support of patients with HF. However, data obtained at the start of the project suggested that HF was often both under-diagnosed and misdiagnosed in primary care and that clinical management was frequently suboptimal (Department of Health, 2013).

In response to this clear and important issue, a two year improvement project, led by the NIHR Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for Greater Manchester was commenced in NHS Bury/NHS Bury CCG. Originally developed and implemented in NHS Manchester, the GM-HFIT improvement project comprises of a series of key interlinked activities which collectively aim to improve the quality of service and care for people with HF in the local area. The GM CLAHRC is a five year (2008-2013) programme of work which aims to develop and implement innovations in care for people with long-term vascular conditions that promote patient self-management, improve quality of care and make more efficient use of scarce NHS resources.

This report presents the findings of the project evaluation. We begin by providing a summary of the background and design of the project, together with an overview of the associated aims and objectives. We then report the project's findings, before examining and discussing the meaning of the results and considering their implications for future work.

# 2. The GM-HFIT Improvement Project

## 2.1. Background to the project

### *2.1.1. Cardiovascular disease and heart failure: the national picture*

Cardiovascular disease (CVD) affects the lives of many millions of people worldwide and is one of the leading causes of morbidity and mortality in England. In 2011, CVD was documented as the primary cause of 29% of all deaths, of which just under half were due to coronary heart disease and almost a fifth due to stroke (South East Public Health Observatory, 2013). Over the last decade, significant improvements have been seen in the prevention, identification and treatment of CVD, with a 40% reduction in CVD mortality rates for persons under 75yrs between 2001 and 2010. During this same time period, the gap between CVD mortality rates in the most and least deprived areas of the country has also narrowed (Department of Health, 2013). However, there is still significant scope for improving the diagnosis and management of CVD nationwide to bring about further improvements in mortality rates and to improve quality of life of patients living with CVD (Murray *et al*., 2013).

As already described in the introduction to this report, chronic HF is a complex and common cardiovascular condition that is thought to affect between 1 and 2% of the adult population in England (British Heart Foundation, 2010). It is the leading cause of hospital readmissions in the UK and has significant negative consequences for patients' quality of life, with over a third experiencing severe and prolonged episodes of depressive illness (Department of Health, 2013). Epidemiological studies also demonstrate that survival rates for patients with HF are worse than those for patients with prostate and breast cancer, with 30 to 40% of patients with HF expected to die within one year of diagnosis (National Institute for Cardiovascular Outcomes Research, 2012).

There is strong evidence to indicate that optimal diagnosis and management of patients with HF can lead to significant improvements in prognosis, reduce hospital admissions and increase life expectancy for patients with this condition (National Institute for Cardiovascular Outcomes Research, 2012). A large number of clinical trials, for example, have demonstrated the considerable prognostic benefits of optimal angiotensin converting enzyme inhibitor (ACEI), angiotensin receptor blocker (ARBs) and beta blocker (BB) therapy in this patient group. There are also a number of evidence based clinical practice guidelines available to support the diagnosis and management of HF patients, such as those provided by the European Society of Cardiology (ESC) and the National Institute for Health and Clinical Excellence (NICE). Nationwide, however, there are recognised shortcomings in the quality of care provided for HF patients, particularly within the primary care setting (Department of Health, 2013).

HF is recognised as being poorly identified and diagnosed in primary care, with its symptoms commonly being equated with respiratory conditions such as chronic obstructive pulmonary disease and asthma (Department of Health, 2013). While the British Heart Foundation indicates that HF prevalence is between 1% and 2% in the UK population, national prevalence at the end of March 2012 was 0.71% (Health and Social Care Information Centre, 2012). However, it should be noted that the quality of HF registers held in primary care is known to be highly variable (GM CLAHRC, 2011). Data also suggests that management in primary care is suboptimal for this patient group. While often considered a disease

of the elderly, improvements in the assessment, diagnosis and management would bring significant benefits, both for patients and the wider health system.

### *2.1.2. Cardiovascular disease and heart failure: the local picture*

*(Data from Public Health England, 2013 and South East Public Health Observatory, 2013 unless indicated)*

Bury has a resident population of 185,000 which is projected to rise to approximately 199,000 by 2021, with the percentage of the population aged 40 or over expected to decrease within the same time period. Levels of deprivation in the local population are lower than the national average, although there is significant variation in deprivation levels observed across the borough. The proportion of the population in Bury from black and minority ethnic groups is also lower than average, estimated to be 10.8% (nationally 14.6%). Research suggests that rates of myocardial infarction are higher in South Asian men and that they are more likely to develop CHD at a younger age.

Life expectancy for both men and women in Bury is lower than the national average. This, however, varies significantly across the local area with life expectancy being 10.8 years lower for men and 8.0 years lower for women in the most deprived areas of Bury than in those areas that are least deprived. Early mortality rates from CVD have decreased nationally by 56.5% since 1995 and have been matched by similar decreases in Bury. CVD mortality rates in Bury, however, continue to be significantly higher than the national average, both for males and females (figure 1).

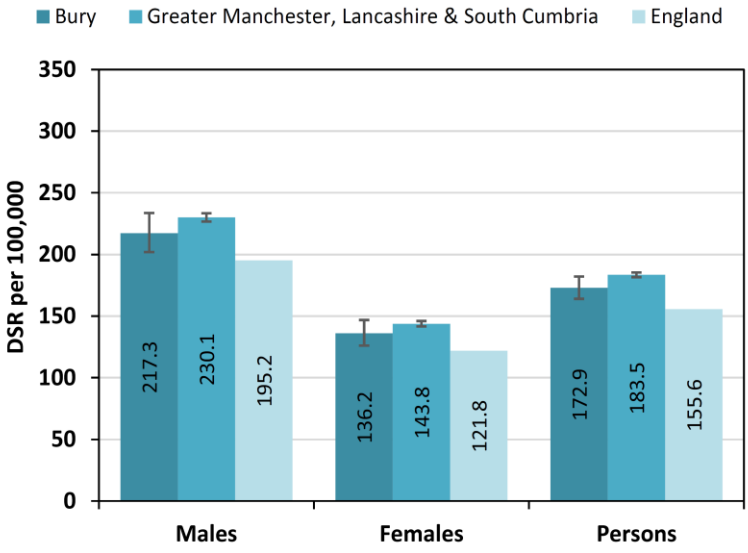



**Figure 1. CVD morality rates by gender for all ages, 2009-11**

HF is a leading cause of emergency admissions and readmissions to hospital across the country. In 2011/12, the emergency admission rate in Bury, for all persons, was 61.1 per 100,000. This is higher than the national average (60.7 per 100,000) but significantly lower than the admission rate observed across Greater Manchester, Lancashire and South Cumbria (67.4 per 100,000). Between 2004/05 and 2011/12, however, the emergency admission rate for HF in Bury has decreased by 25.7%. This is considerably higher than the reductions in admission rates seen both nationally (18.0%) and regionally (20.4%) within the same time period.

The recorded prevalence of HF in Bury was 0.66% in March 2012. This is lower than the national prevalence of 0.71% and considerably lower than the anticipated 1 to 2% prevalence described by the British Heart Foundation (2010). This has been attributed, by some, to the difficulties associated with distinguishing the symptoms of HF from those associated with respiratory disease such as chronic obstructive pulmonary disease (Department of Health, 2013). However, findings from an earlier phase of the GM-HFIT project suggested that practice-based errors in the clinical coding of HF may also account for a proportion of the gap between recorded and expected HF prevalence (GM CLAHRC, 2011). Data from the 2011/12 Quality and Outcomes Framework also demonstrated that the use of ACEI/ARB (90.6%) and BB (84.5%) therapy for patients with left ventricular dysfunction in Bury was marginally higher than the national average (89.3% and 83.9% respectively), a picture that has remained reasonably consistent over the last few years

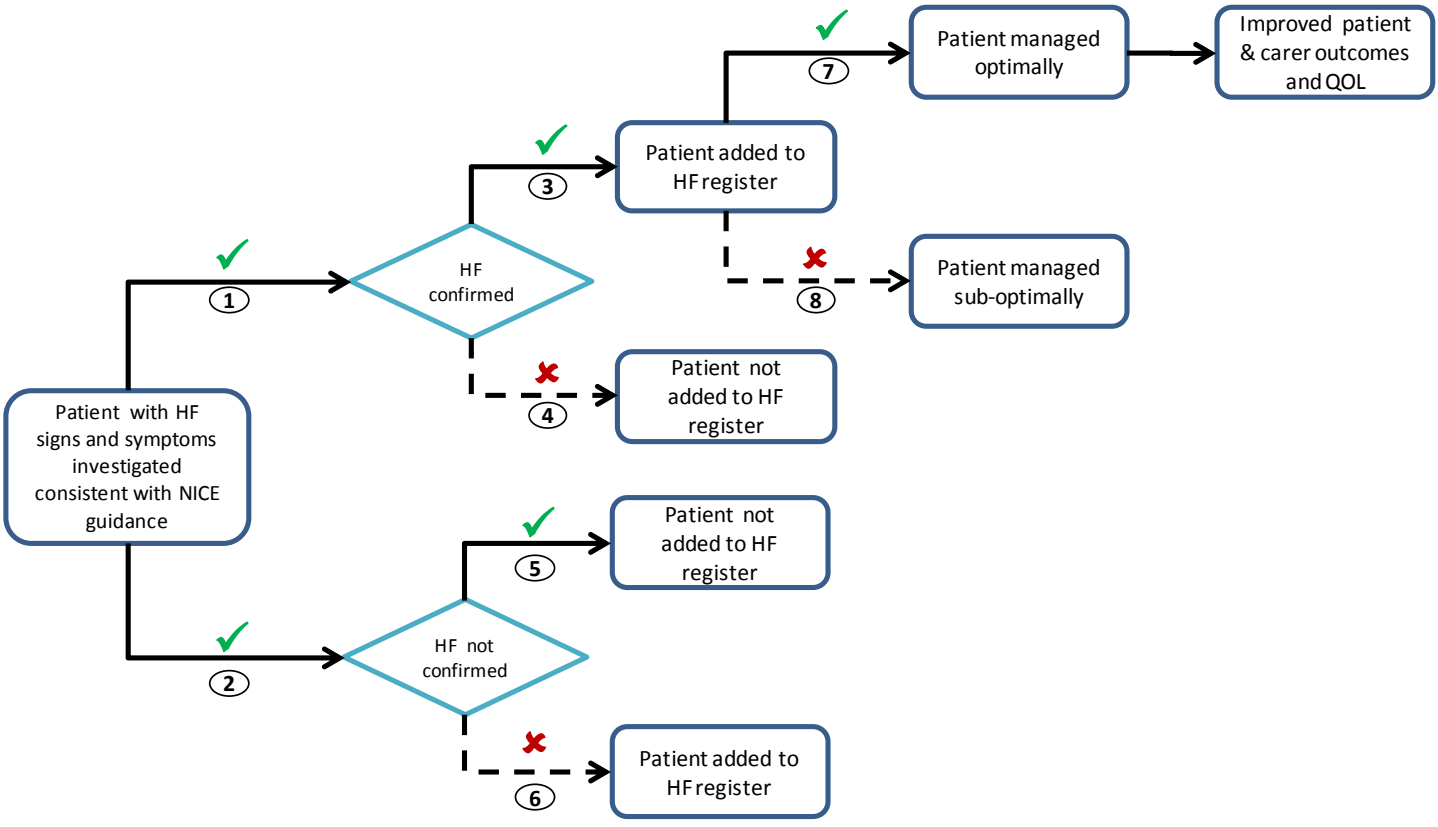
(Health and Social Care Information Centre, 2012). While encouraging improvements in both cardiovascular outcomes and HF management have been observed in Bury over the last decade, these figures still collectively serve to suggest that there remains significant scope for improvement in the diagnosis and management of people with HF across the local area.

### 2.2. Project aim and objectives

The GM-HFIT project was established in NHS Bury/NHS Bury CCG in January 2012 with the overarching aim of improving the quality of service and care for people with HF across the local area. The associated objectives were:

- To ensure that 100% of patients on practice HF registers had a confirmed diagnosis.
- To ensure that 100% of practices correctly coded HF patients and implemented a standardised HF review template.
- To ensure that 80% of patients are on appropriate medical therapy and are titrated, or being titrated, to recommended dosages as tolerated (unless documented as contraindicated).
- To provide HF education and a continuing rolling programme of education, with representation from 100% of the practices involved in the project.

The logic diagram for the project, which provides an analytical framework for this evaluation, is provided below:



## 2.3. Project design

The GM-HFIT project in Bury builds on the results of a previous phase of the improvement project undertaken in NHS Manchester/NHS Manchester CCG (North, Central and South) in 2009, the key results of which are described in section 2.4 of this report. The project consists of a series of key interlinked activities, including register verification and case finding, audit of HF management, feedback meetings, clinical education sessions, facilitation support and a final reaudit exercise. Figure 2 below offers an overview of the processes associated with the project. A detailed description of each element is then provided.

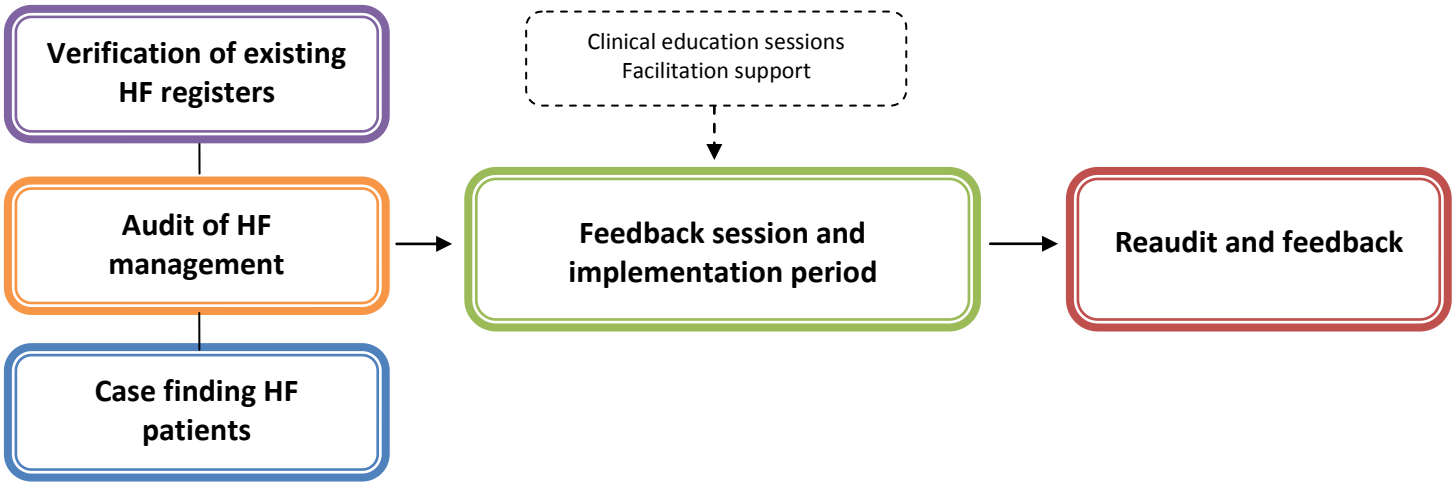



**Figure 2. Design of the GM-HFIT improvement project**

### *2.3.1. Verification of existing heart failure registers*

The record of each patient on the HF register was manually audited by a heart failure specialist nurse (HFSN) to identify whether they had a confirmed diagnosis of HF. Based on this assessment, patients were then classed as appropriate or inappropriate for the HF register or as requiring further investigation. For each patient, a rationale for this classification was documented and recommendations made in relation to their future management. The nature of these recommendations was wide ranging, highlighting, for example:

- The need for further diagnostic investigations, either to verify a diagnosis of HF or to support ongoing management.
- The need to remove patients from the HF register where there was evidence to refute a diagnosis of HF.
- Requirements to initiate and/or uptitrate patients' HF medication.
- The use of medication not licensed for or contraindicated in HF
- Errors in Read coding. This included highlighting where Read codes needed to be added to patients' records and where existing Read codes required amendment (for example, where echocardiograms had been coded as electrocardiograms).
- Cases where it would be appropriate to consider making a referral to the HF specialist nurse for education, medication titration and ongoing management.

- Incidences where appropriate immunisations (i.e. influenza and pneumococcal) had not been administered.

### *2.3.2. Audit of heart failure management*

The management of each patient on the HF register was assessed against 21 key performance indicators derived from the NICE chronic HF guidelines. This included assessment of factors such as medication use, pulse checks, blood pressure management and the provision of self-management education. Collectively this information was then used to generate a traffic light score for the practice to allow for assessment of the overall quality of HF care provided. This assisted the HFSNs in identifying the areas that required improvement at the individual practice level and provided a benchmark against which any subsequent improvements in the standard of HF management could be assessed.

### *2.3.3. Case finding heart failure patients*

A series of searches (see appendix 1) were run on the practice system to provide a list of patients who may have a confirmed diagnosis of HF but were not on the HF register. The record of each of these patients was then manually checked by a HFSN to identify patients with a confirmed HF diagnosis and those requiring further investigation to confirm of exclude a diagnosis of HF. The rationale for this decision was documented, together with recommendations for further management where required.

### *2.3.4. Feedback session and implementation period*

The results of the verification, audit and case finding exercises were fed back to the practice by the HFSN who completed the audit. Each practice was additionally provided with a folder containing the results of the audit, together with supporting resources and educational materials and an action plan developed on the basis of the audit findings. Following this feedback session, support and further input from the HFSN was available to each practice, to assist them in implementing and acting upon the verification, management audit and case findings results.

During this implementation period, clinical staff were also invited to attend one of three half-day education sessions delivered by the local heart failure specialist nurses. These sessions were interactive and case-study based and covered topics pertinent to the management of HF in primary care, such as aetiology and diagnosis, pharmacological management and medication titration, patient monitoring and review, patient education and palliative care.

### *2.3.5. Reaudit and feedback*

The verification and management audit processes described in sections 2.3.1. and 2.3.2. were repeated by a HFSN, this time in relation to each of the patients on the HF register at the end of the project. This allowed for changes in the validity of the HF register and the quality of the HF care provided by the practice. New HF diagnoses (i.e. patients who had been added to the HF register since the baseline audit, but had not been identified through the case finding process) were of particular interest at this stage. The appropriateness of their addition to the register and the quality of their subsequent management provided an indication as to whether sustainable improvements in the diagnosis and management of patients with HF had been achieved.
A final feedback meeting was then held to provide the practice with an overview of the findings of this reaudit process and discuss any outstanding actions and further steps that may need to be taken by the practice to improve the quality of HF management they offer.

## 2.4. Results from the previous phase of the GM-HFIT project

As mentioned in section 2.3., the GM-HFIT project described in this report builds on the results and learning generated in an earlier project conducted in NHS Manchester/Manchester CCG (North, South and Central). To enable the results seen in the project in Bury to be considered and assessed in the context of those that have been obtained elsewhere, a short overview of the key results from the Manchester project is provided below- the full evaluation report is available elsewhere (GM CLAHRC, 2011). When interpreting these results, however, it is important to consider that this project was of a considerably smaller scale to that completed in Bury, with practices involved primarily being those considered 'innovators' or 'early adopters' in relation to this type of work.

### *2.4.1. Changes in heart failure prevalence and register validity (NHS Manchester)*

- Across all practices (*n*=10), the percentage of patients on the HF register with a confirmed diagnosis increased from 59.7% to 79.0%, with improvements being observed across all practices.
- A total of 237 patients with a confirmed diagnosis of HF were identified through the case finding process.
- By the end of the project, average HF prevalence increased from 0.55% to 0.67%. The scale of the increase in prevalence was, however, highly variable across practices, with one practice seeing a reduction in prevalence and a further practice seeing no change.

### *2.4.2. Changes in the quality of heart failure management (NHS Manchester)*

- The average traffic light score increased by 10 points, from 42 (amber- good HF care) to 52 (green- very high quality of HF care). Improvements in traffic light scores were observed across all practices, ranging from an increase of 3 to 27 points.
- On average, some improvements were seen in the proportion of patients with confirmed left ventricular systolic dysfunction appropriately prescribed ACEI/ARB (88.5% to 90.3%) and BB therapy (71.6% to 82.6%) licensed for HF. More significant improvements, however, were observed in the proportion of patients receiving optimal doses of these therapies.
- Changes across other key performance indicators were highly variable.

# 3. Findings and Results

Please note, with the exception of the 'traffic light score', all figures presented here at CCG- and sector-level are weighted according to the size of practice-held HF registers.

### 3.1. Participating GP practices

All 33 GP practices comprising NHS Bury CCG were invited to take part in the project. A number of different approaches were used to recruit practices, including members of the GM CLAHRC team attending sector and practice meetings, local CCG leaders contacting individual practices and the inclusion of items in CCG-wide newsletters and bulletins.

**28 of the 33 (84.8%) of the GP practices** elected to participate in the project. One practice, however, did not complete the reaudit process as the feedback of the baseline audit results was considerably, yet unavoidably, delayed due to a change in practice ownership. Therefore, the results presented here are for the **27 practices** that completed both the baseline and reaudit processes. At reaudit, the average practice list size was 6,277 patients (range, 1,814 to 12,318).

The table below details the distribution of the 27 practices across the four CCG sectors.

| Sector | Number of practices completing the project (% of sector practices) |
|---|---|
| North | 5 (100%) |
| East | 8 (67%) |
| West & Central | 6 (100%) |
| South | 8 (80%) |

### 3.2. Education session attendance

Three half-day heart failure education sessions were hosted by the GM CLAHRC (June 2012, December 2012 and April 2013). The table below details the number of attendees at these sessions, broken down by professional group. In total, 16 (57.1%) of the practices participating in the project were represented at at least one of these sessions. This included 2 practices from the North sector (40% of those participating), 7 practices from the East sector (87.5%), 2 from West and Central sector (40%) and 5 from the South sector (62.5%).

| Professional group | Number of attendees (% of all attendees) |
|---|---|
| General Practitioner | 27 (65.9%) |
| Practice Nurse | 6 (14.6%) |
| Medical Student | 5 (12.2%) |
| Other (e.g. care coordinator) | 3 (7.3%) |

In addition to these three education sessions, the GM CLAHRC HF specialist nurses hosted an education session at the local practice nurse forum, attended by approximately 15 practice nurses from across the CCG footprint.

## 3.3. Heart failure prevalence and register validity

### *3.3.1. Verification of existing heart failure registers*

At the point of baseline audit, across all of the 27 GP practices, there were a total of **1,087 patients on practice-held HF registers** (average, 40; range, 6 to 118). The **average HF prevalence was 0.65%** (range, 0.33 to 1.15%). Of these patients, across all practices audited, **71.1%** (range, 47.1 to 92.3%) were **found to be appropriate** for the HF register, **20.3%** (range, 6.8 to 35.7%) **required further investigation** and **8.6%** (range, 0.0 to 25.0%) were **considered to be inappropriate** and to thus warrant removal from the register. The results for each CCG sector are provided in Figure 3.

Patients were considered inappropriate for the HF register only where there was clear evidence in their records to indicate that they did not have HF. Frequently such patients were found to have been added to the register following documentation of a diagnosis of 'CCF' on a discharge summary, but had subsequently gone on to have outpatient echocardiograms demonstrating normal heart function. Patients were indicated as requiring further investigation where there was no diagnostic evidence of HF to unequivocally support either the presence or absence of HF.

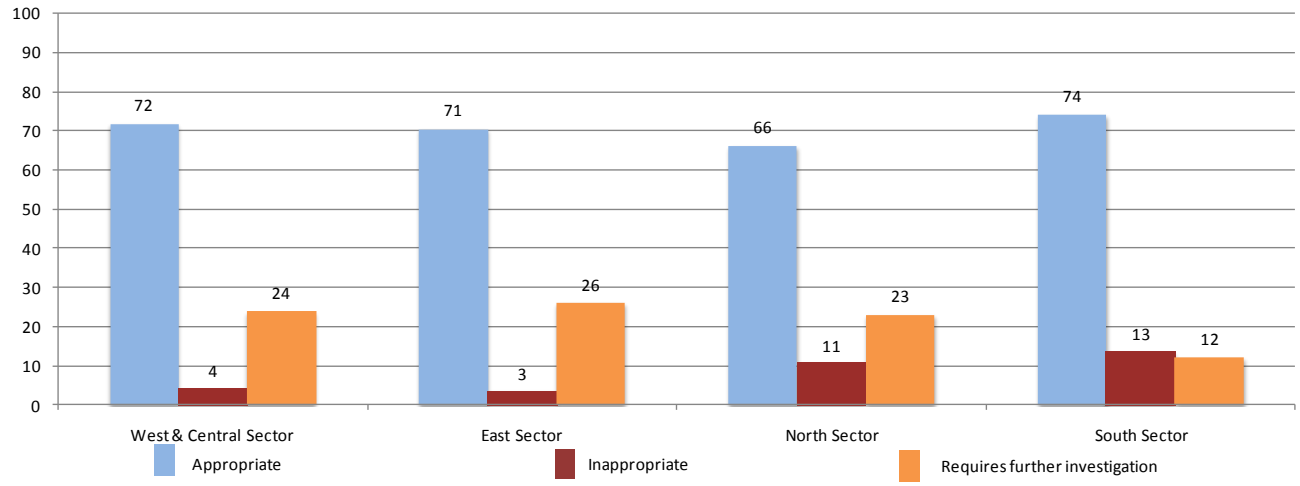



**Figure 3. For each CCG sector, the percentage of patients currently on the QOF HF register who are appropriate, inappropriate or require further investigation to be on the register.**

### *3.3.2. Case finding heart failure patients*

Across all 27 participating practices, a total of **9,916 patient records were identified by the case finding searches**. Each of these records was manually audited to identify patients who had a confirmed diagnosis of HF but were not on the register and patients who had signs and symptoms of HF or other indications that they required further investigation. The table below documents the results of the case finding process:

| Action required | Number of patients (% of all records identified) |
|---|---|
| Addition to the register | 625 (6.3%) |
| Referral for echocardiogram | 77 (0.8%) |
| Request echocardiogram report | 67 (0.7%) |
| Referral to specialist services | 21 (0.2%) |
| GP to review patient case | 362 (3.7%) |

The results for each CCG sector are provided in Figure 4.

Using the results of the verification and case finding processes, 'new' minimum and maximum HF prevalences were calculated to offer an indication of the HF prevalence that would be achievable, and expected, should all practices implement recommended actions, such as adding and removing patients to the HF register. These calculations **predicted the 'new' average minimum and maximum HF prevalence**, across NHS Bury CCG at reaudit, to be **0.85%**[*] (range, 0.36 to 1.35%) and **1.30%**[†] (range, 0.55 to 1.84%) respectively. Figure 5 details the predicted new minimum and maximum HF prevalence across each CCG sector.

[*]*Based on the number of patients identified through the case finding process as requiring addition to the HF register and the number of patients considered to be appropriately on the existing HF register.* [†]*Based on the number of patients identified through the case finding process as requiring any action and the number of patients considered to be appropriately on the existing HF register or requiring further investigation.*

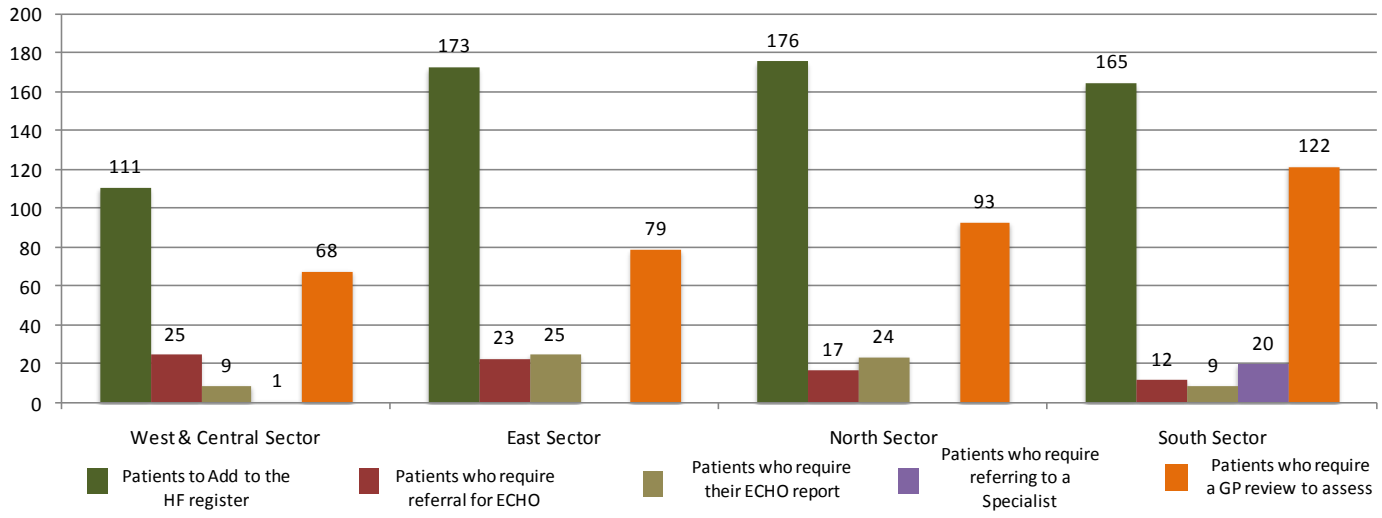



**Figure 4. For each CCG sector, the number of patients identified by the case finding process as requiring each action (e.g. addition to the HF register, referral for echo)**

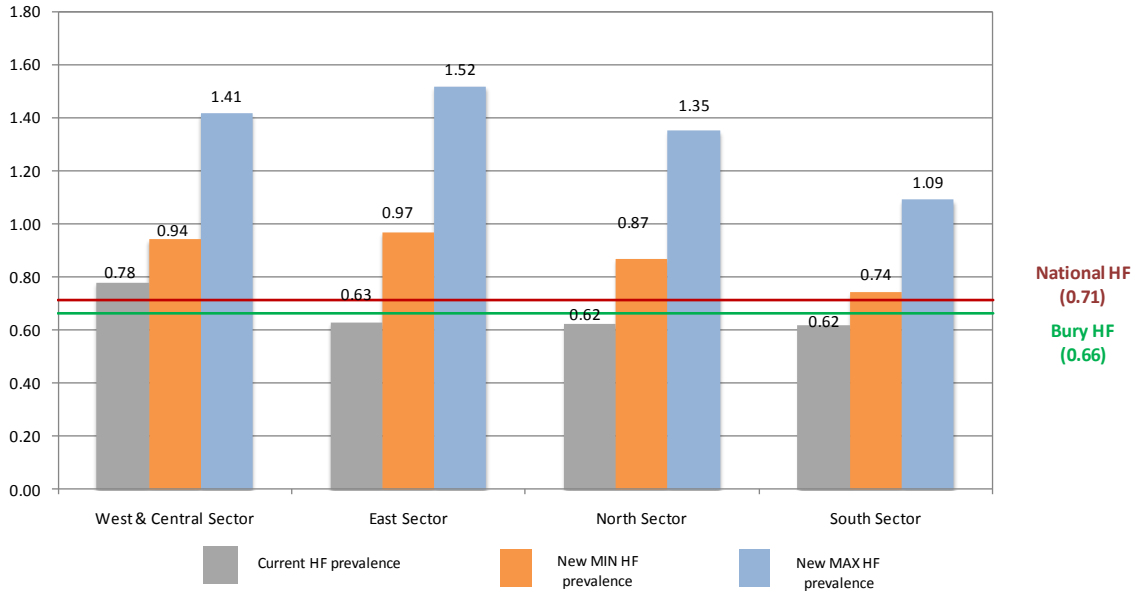



**Figure 5. For each CCG sector, the predicted new maximum and minimum HF prevalence**

### *3.3.3. Reaudit findings*

At the point of reaudit, there were a total of **1,538 patients** (average, 57; range, 7 to 155) **on practices' HF registers**. Comparing this figure with the baseline HF register size for these practices, this represents a **41.5% increase** in the number of patients on HF registers across NHS Bury CCG. The **prevalence across NHS Bury CCG increased from 0.65%** (range, 0.33 to 1.15%) to **0.92%** (range, 0.26 to 1.54%). Figure 6 presents the HF prevalence changes across each sector, benchmarking these against the local and national prevalence figures provided by the QOF 2011/12 dataset.

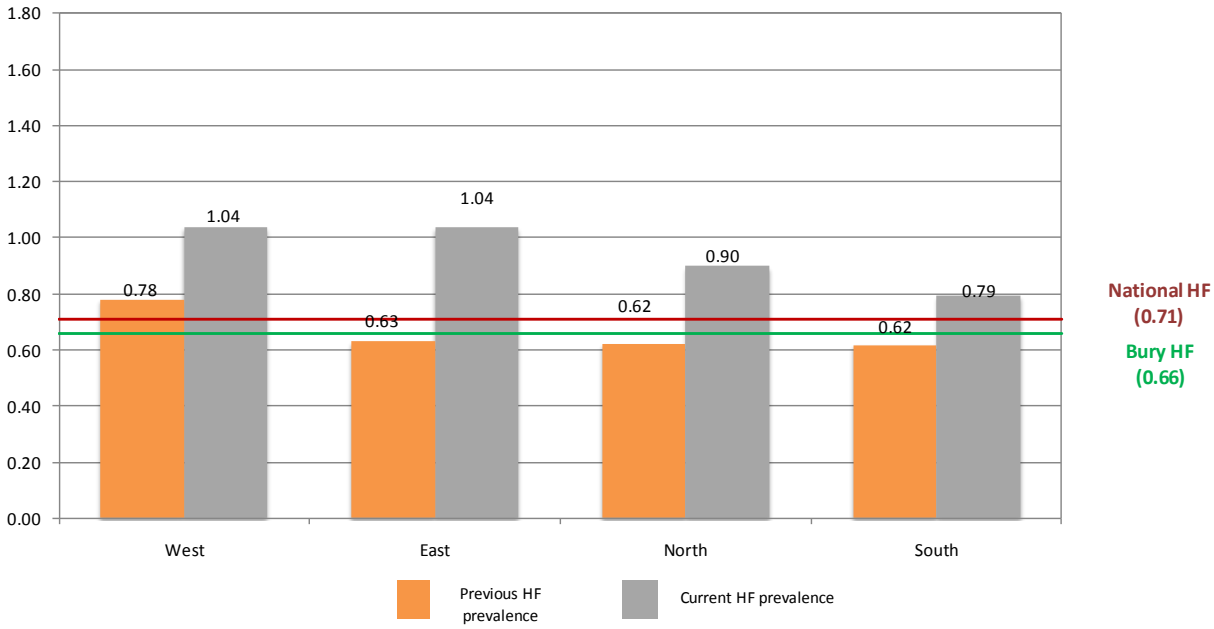



**Figure 6. For each CCG sector, the average HF prevalence at baseline and reaudit**

An increase in prevalence was observed at 24 of the 27 GP practices (88.9%) completing the reaudit process. At two practices there was a small decrease in prevalence (from 0.33 to 0.26% and from 0.50 to 0.47%) and at a one there was no observed change. The most significant increase was 0.57%, which occurred in two instances (from 0.55 to 1.12% and 0.70 to 1.27%).

Of the 1538 patients on the HF registers at reaudit, 55.9% (*n*=859) had been on the register at the time of the baseline audit, 32.1% (*n*=493) were those that had been identified through the case finding process and 12.1% (*n*=186) were patients who had been diagnosed with HF, and added to the HF register, since the baseline audit.

At the point of reaudit, across all 27 practices, **86.2%** (*n*=1326; range, 73 to 100%) of the 1538 patients on practice registers were **considered appropriate for the HF register**, **8.4%** (*n*=129; range, 0 to 19%) were thought to **require further investigation to confirm a diagnosis** and **5.4%** (*n*=83; range, 0 to 12%) were considered to have **no HF** and therefore warrant removal from the register. The table below documents the percentage change, between the baseline and reaudit processes, in the proportion of patients considered appropriate, inappropriate and requiring further investigation.

| **Status** | **Baseline Audit Number of patients (%)** | **Reaudit Number of patients (%)** | **Relative % difference** |
|---|---|---|---|
| Appropriate | 773 (71.1%) | 1326 (86.2%) | + 21.2% |
| Further investigation | 221 (20.3%) | 129 (8.4%) | - 58.6% |
| Inappropriate | 93 (8.6%) | 83 (5.4%) | - 37.2% |

Figure 7 presents the changes in the validity of the HF registers across each sector between the baseline audit and case finding processes, and the reaudits. Of note, the proportion of patients considered appropriate for the HF register increased across all 27 practices.

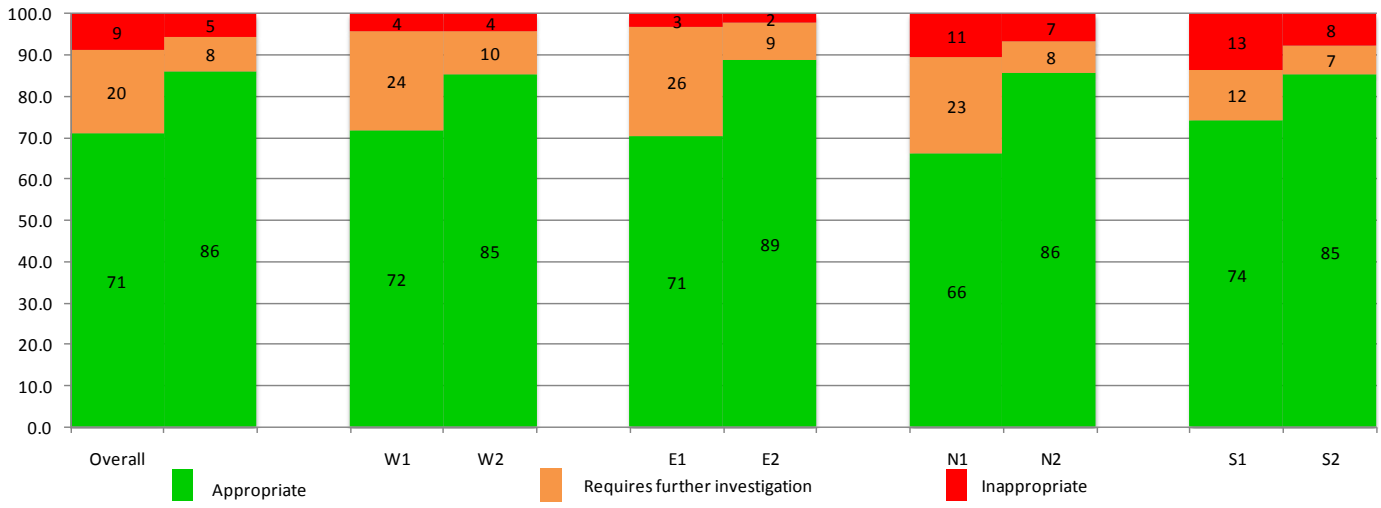



**Figure 7. Overall, and for each sector, the percentage of patients at baseline and reaudit considered appropriate, inappropriate for the HF register or to require further investigation.**

Figure 8 breaks these results down further, separately examining the validity of patients who were on the register at the time of the baseline audit, those identified through the case finding process and 'new' patients who had been diagnosed with HF since the baseline audit.

At the point of reaudit, of those patients who were on the HF registers at the time of the baseline audits, 81.4% (*n*=699) were now considered appropriate, 10.8% (*n*=93) required further investigation and 7.8% (*n*=67) were deemed inappropriate for the register. Of those patients that had been identified by the case finding process as requiring an action (of any kind) and had subsequently been added to the register, 98.8% (*n*=487) were considered appropriate, 0.8% (*n*=4) to require further investigation and 0.4% (*n*=2) to be inappropriate. Finally, of the 'new' patients on the HF registers, 75.8% (*n*=141), 16.7% (*n*=31) and 7.5% (*n*=14) were considered appropriate, to require further investigation and inappropriate respectively.

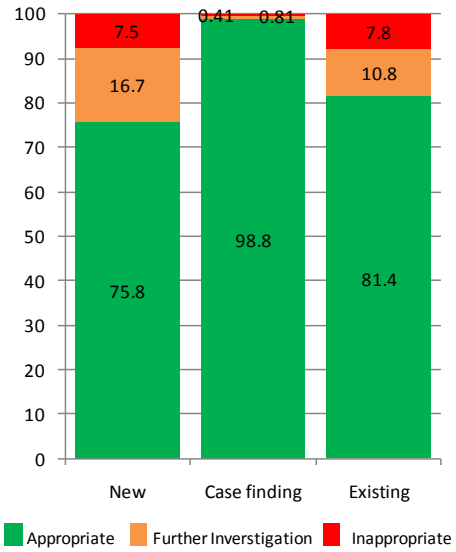



**Figure 8. By origin, the percentage of patients on HF registers at the time of reaudit considered to be appropriate, inappropriate and require further investigation**

### 3.4. Heart failure patient demographics

At the point of reaudit there were 1538 patients on the HF registers. Of these, **62.7%** (*n*=963) **were male** and **37.3%** (*n*=574) **were female**. The table below details the age distribution of these patients.

| Age bracket | Number of patients (%) |
|---|---|
| 44yrs and under | 37 (2.4%) |
| 45-54yrs | 93 (6.1%) |
| 55-64yrs | 201 (13.1%) |
| 65-74yrs | 411 (26.7%) |
| 75yrs and over | 795 (51.7%) |

At the baseline audit, data was collected regarding the number and nature of co-morbid conditions with which patients on the HF register presented. This data is presented in the table below and figure 9. The median number of comorbidities was 3 (range, 0 to 7).

| **Number of comorbidities** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
|---|---|---|---|---|---|---|---|---|
| **Number of patients (%)** | 66 (6.1%) | 186 (17.1%) | 259 (23.9%) | 276 (25.4%) | 184 (17.0%) | 84 (7.7%) | 23 (2.1%) | 7 (0.6%) |

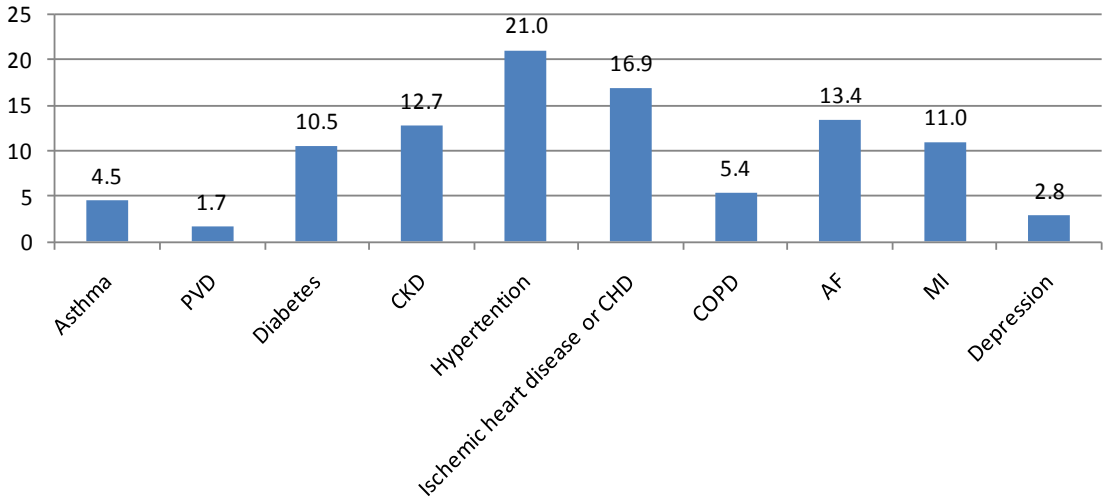



**Figure 9. The percentage HF patients presenting with a series of comorbid conditions.**

Since 2006/07, the QOF dataset has calculated the proportion of patients on HF registers who were diagnosed with HF on, or after, 01 April 2006, the date the revised QOF contract came into operation. As detailed by figure 10 below, at the time of baseline audit, across NHS Bury CCG, of those patients who were considered appropriate for the HF register and had a documented diagnosis date, 76.4% (*n*=578) had been diagnosed on or after 01 April 2006. At reaudit, however, this figure had increased to 84.5% (*n*=1105%).

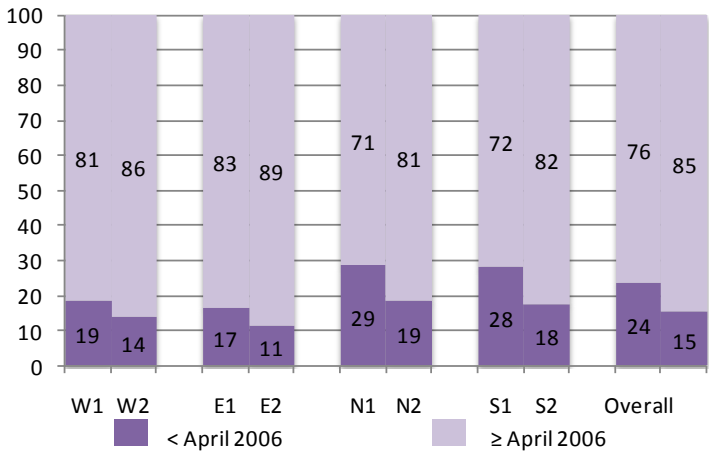



**Figure 10. The proportion of 'appropriate' HF patients, at baseline and reaudit, diagnosed before or on/after 01 April 2006.**

The table below additionally details the proportion of 'appropriate' patients on the HF register, at baseline and reaudit, with different 'types' of HF (e.g. left ventricular systolic dysfunction (LVSD), diastolic dysfunction). As illustrated, while the proportion of patients on the HF register with LVSD remained relatively consistent, there was a small yet significant increase (4.2 to 6.6%) in the proportion of patients documented as having diastolic dysfunction *(also known as HF with preserved ejection fraction)*.

| **'Type' of HF** | **Baseline Audit Number of patients (%)** | **Reaudit Number of patients (%)** | **Relative % difference** |
|---|---|---|---|
| LVSD | 688 (90.9%) | 1176 (90.0%) | -1.0% |
| Diastolic dysfunction | 32 (4.2%) | 86 (6.6%) | +57.1% |
| Right-sided | 21 (2.8%) | 22 (1.7%) | -39.3% |
| Other | 16 (2.1%) | 23 (1.8%) | -14.3% |

Of those patients on the HF register with documented LVSD, the table below also presents, where available, the proportion of patients across the CCG considered to have mild, moderate or severe functional impairment on echocardiogram

| **Level of functional impairment** | **Baseline Audit Number of patients (%)** | **Reaudit Number of patients (%)** | **Relative % difference** |
|---|---|---|---|
| Mild | 196 (28.9%) | 405 (34.9%) | +20.8% |
| Moderate | 206 (30.3%) | 373 (32.2%) | +6.3% |
| Severe | 277 (40.8%) | 381 (32.9%) | -19.4% |

### 3.5. Quality of heart failure management

The GM-HFIT audit tool generates, for each practice, a traffic light score based on their performance across a wide range of evidence-based key performance indicators (e.g. measurement of pulse rate/rhythm, provision of six monthly HF reviews). The total traffic light score is out of 80, with scores greater than 76 being classified as gold (outstanding), 50-75 green (very high quality care), 25-49 amber (good) and less than 25 red (requires major improvement)**.** This provides insight into whether improvements in the diagnosis and management of HF have been made over the course of the project. At reaudit, on average across all 27 GP practices, a **7 point increase in traffic light score** was observed, from 43 to 50. Changes in the traffic light scores for each CCG sector are presented in figure 11.

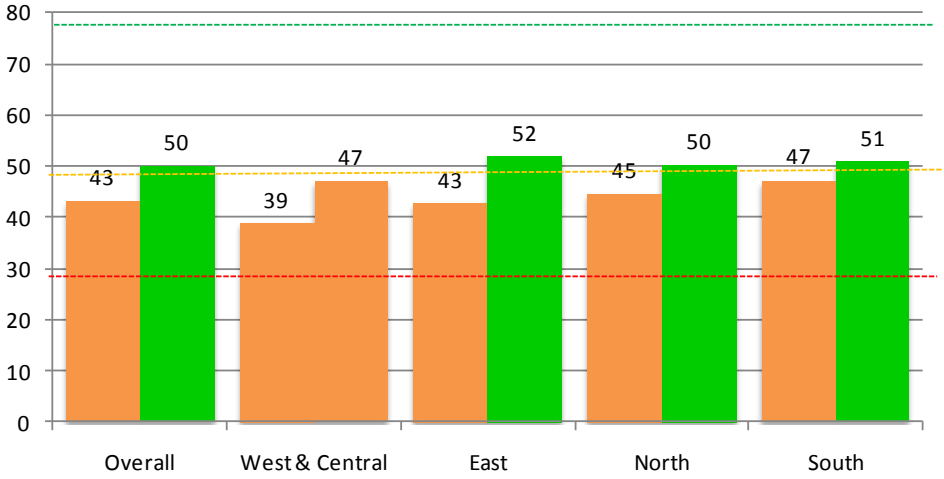



**Figure 11. For each sector, the average traffic light score at baseline and reaudit**

An increase in traffic light score was observed at 19 of the 27 practices (70.4%). However, at a single practice (3.7%) no change was observed and a decrease was observed at 7 of the participating practices (25.9%). Changes in traffic light score ranged from an increase of 35 points (from 45 to 80pts) and a decrease of 3 points (from 51 to 48pts). Of note, there was no observable significant difference in the reaudit traffic light score for patients who had been on the register at the time of the initial baseline audit and those who have been subsequently added, either as a result of the case finding process or due to a 'new' HF diagnosis.

At reaudit, across NHS Bury CCG, there had been a small decrease in the proportion of the patients on the HF register **under the care of the HF specialist nurse**, either in secondary care or the community from **16.6%** to **13.5%**. However, as illustrated in figure 12, this trend was not consistent across all of the practices and CCG sectors.

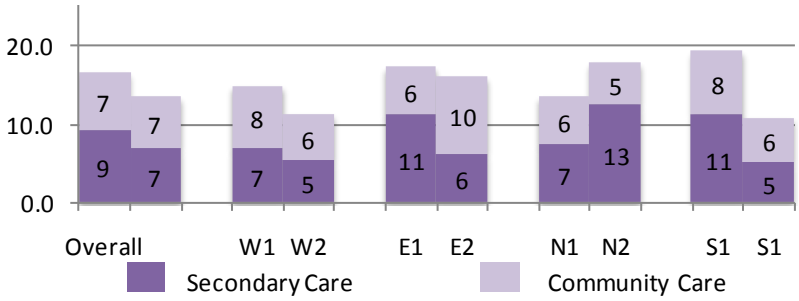



**Figure 12. Overall, and for each sector, the proportion of HF patients at baseline and reaudit under the care of the secondary care and community HF specialist nurse.**

### *3.5.1. Heart failure reviews*

NICE recommends that all HF patients receive regular monitoring and reviews of their condition. The frequency of these reviews should be dependent on individual patients' clinical status and stability, but, at a minimum, should be six monthly. Reviews may be conducted in primary care or, where appropriate, by specialist HF services. Between baseline and reaudit there was a significant increase in the proportion of HF patients that had received, or were documented as requiring, a **six monthly or annual review** from **15.3%** to **38.0%** (six monthly 9.7 to 28.9%; annual 5.6 to 9.1%) as

detailed in figure 13. It is important to acknowledge, however, that, while not specifically documented as relating to HF, at both time points, a number of additional patients, particularly those with multimorbidity, will have been having their condition monitored as part of a wider Long Term Condition review.

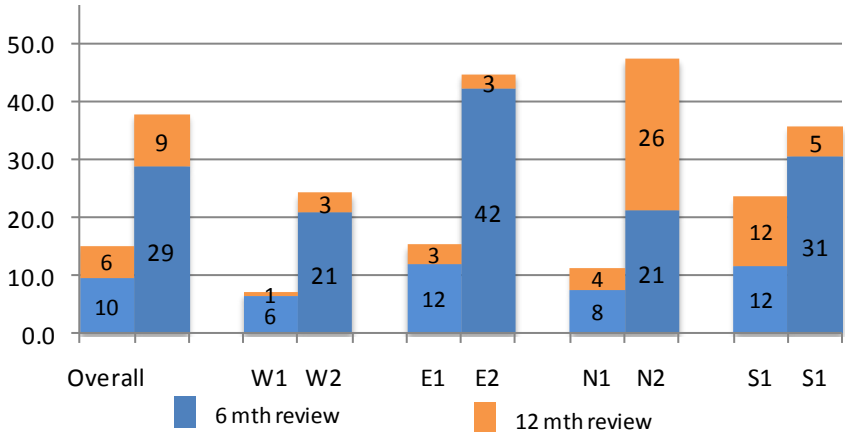



**Figure 13. Overall, and for each sector, the proportion of HF patients at baseline and reaudit receiving, or documented as requiring a six month or annual HF review**

The most significant change was observed in those HF reviews documented as being provided (or scheduled) by primary care services, with the number of reviews, either six monthly or annually, provided in this setting increasing from 6.3% to 22.1% (Relative percentage difference: +250.8%).

### *3.5.2. Pharmacological treatment for heart failure*

The 2010 NICE chronic HF clinical guidelines state that all patients with HF due to LVSD should be offered both ACEI/ARBs and BBs licensed for HF unless contraindicated. Due to the prognostic benefits offered by these therapies, this includes patients who are asymptomatic.

At reaudit, a small decrease in the **use of ACEI/ARB therapy** for patients with confirmed LVSD was observed on average across all 27 practices (Figure 14). The proportion of patients with confirmed LVSD either on an ACEI/ARB or for whom it was documented that this therapy was contraindicated decreased from **91.2%** (84.1% on ACEI/ARB; 7.1% contraindicated) to **88.9%** (79.9% on ACEI/ARB; 9.0% contraindicated). This decrease was not consistent across all sectors or GP practices. A decrease in ACEI/ARB use or documented contraindication was observed in 15 of the 27 GP practices (55.6%). However, there was an increase at 10 practices (37.0%) and no apparent change at a further 2 (7.4%).

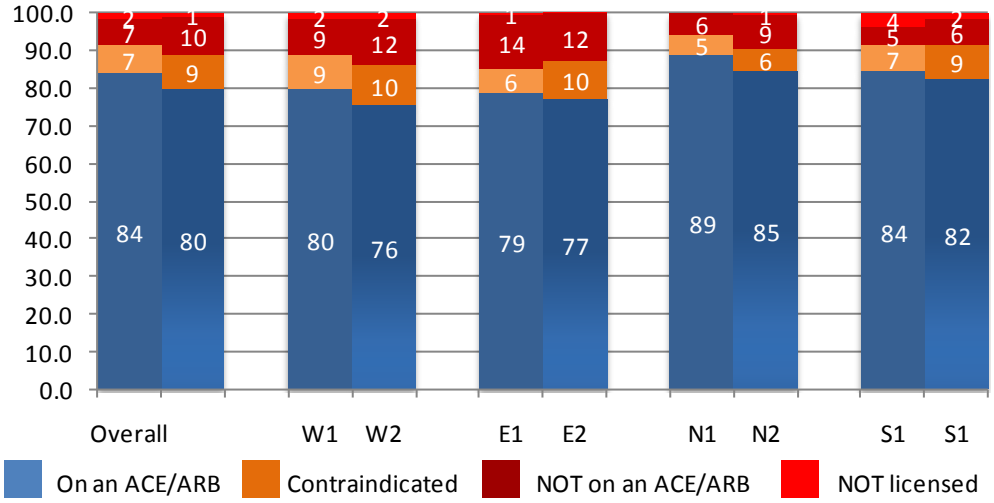



**Figure 14. Overall, and for each sector, the percentage of patients with confirmed LVSD receiving ACEI/ARB therapy**

A similar pattern was observed for the use of BB therapy for patients with confirmed LVSD (Figure 15). The proportion of patients **in receipt of BB therapy**, or for whom it was documented as contraindicated, decreased from **84.3%** (67.6% on BB; 16.7% contraindicated) to **82.4%** (68.4% on BB; 14.0% contraindicated). This was consistent across all of the CCG sectors, but not across all practices. Decreases were observed in 14 practices (51.9%), increases in a further 12 (44.4%) and no change at a single GP practice (3.6%).

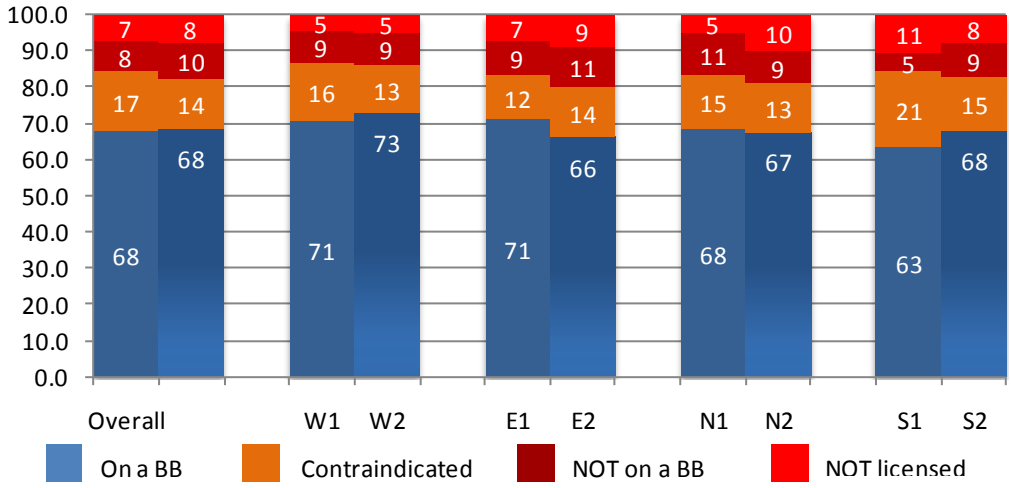



**Figure 15. Overall, and for each sector, the percentage of patients with confirmed LVSD receiving BB therapy**

There was, however, for both ACEI/ARB and BB therapy, an increase in the proportion of patients receiving these therapies being treated to optimal tolerated dose. From baseline audit, the percentage of patients receiving a maximum tolerated **dose of ACEI/ARB**, or being up-titrated (including evidence of an intention to uptitrate), increased across Bury from **79.7%** (72.6% optimised; 7.1% up-titrating) to **84.2%** (79.6% optimised; 4.6% up-titrating) (Figure 16). This increase was consistent across all of the CCG sectors and observed in 18 of the 27 (66.7%) GP practices.

On average, the proportion of patients being treated to maximum tolerated **dose of BB**, or being up-titrated, also increased from **78.0%** (70.6% optimised; 7.4% up-titrating) to **84.8%** (79.4% optimised; 5.4% up-titrating). As illustrated in figure 17, however, this picture was not consistent across all CCG sectors. An increase in BB optimisation or up-titration was observed in 14 GP practices (51.9%), with a decrease evident in 11 practices (40.7%) and no change in a further 2 (7.4%)

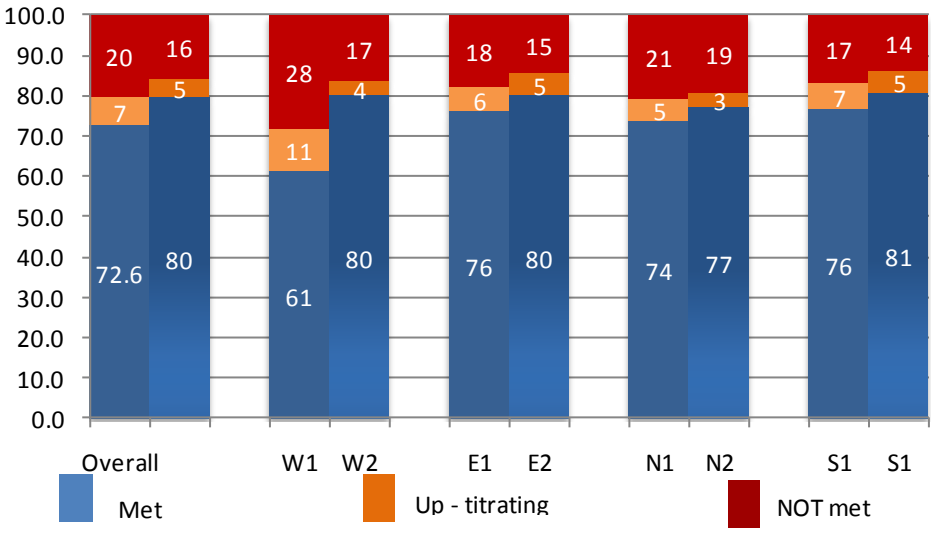



**Figure 16. Overall, and for each sector, the percentage of patients receiving ACEI/ARB therapy treated to optimal tolerated dose**

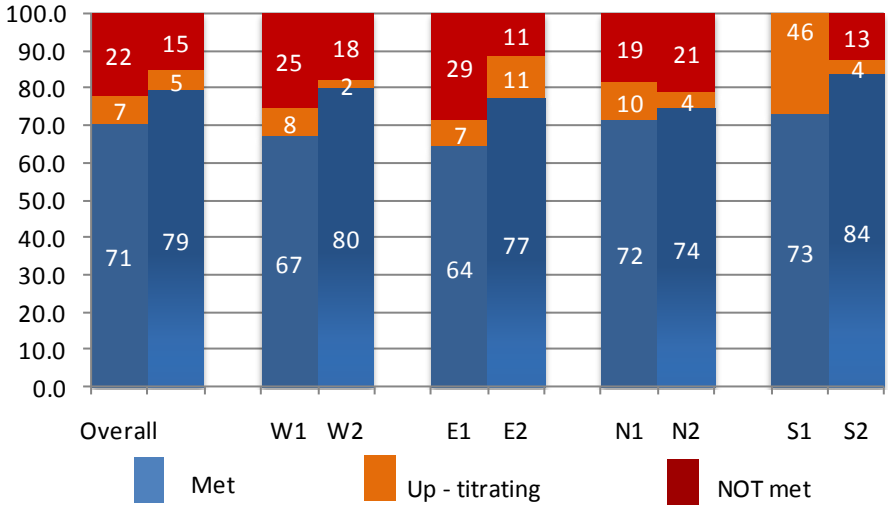



**Figure 17. Overall, and for each sector, the percentage of patients receiving BB therapy treated to optimal tolerated dose**

### *3.5.3. Clinical assessment*

As previously described, all patients with chronic HF require routine clinical monitoring. This monitoring should include examination of cardiac rhythm. Over the course of the project an increase was seen in the proportion of HF patients documented as having had their **pulse rate (54.6 to 60.4%)** and/or **rhythm (40.2 to 46.8%)** checked in the previous 12 months. These increases held across all CCG sectors. In recent years, evidence has emerged indicating that controlling

heart rate in patients with chronic HF to less than 70bpm reduces hospitalisations and offers mortality benefits. At reaudit, on average and across all sectors, there was a small increase (from 45.1 to 50.2%) in the percentage of patients with a pulse rate check in the previous 12 months whose documented rate was less than 70bpm.

Small overall increases were additionally observed in the proportion of patients on the HF registers who had a documented **oedema (from 25.5 to 27.5%)** and/or **weight check (from 15.7 to 20.8%)** in the previous 12 months. As figures 18 and 19 below illustrate, this increase was consistent across all sectors for weight checks, but not for the monitoring of oedema. A negligible increase was also observed in the proportion of HF patients with a documented blood pressure check in the previous 12 months (from 94.3 to 94.5%).

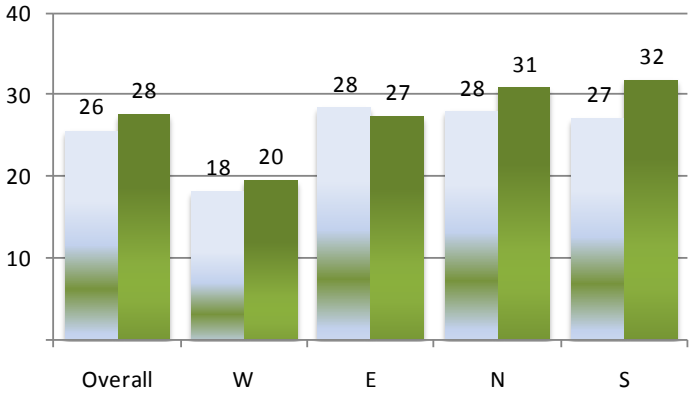



**Figure 18. Overall and for each sector the proportion of HF patients with an oedema check in the previous 12 months**

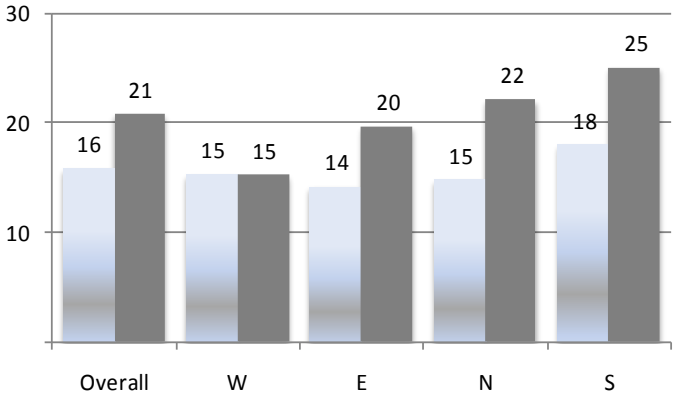



**Figure 19. Overall and for each sector the proportion of HF patients with a weight check in the previous 12 months**

As part of their ongoing monitoring, patients with chronic HF should have their functional capacity clinically assessed. This is commonly done using the New York Heart Association (NYHA) classification which places patients in one of four categories (NYHA I-IV) based on how symptomatic they are. Clinically, this information is of value to support the ongoing management of patients, in particular to guide the appropriate selection and titration of pharmacological therapies. Over the course of the project there was a **small decline in the proportion of patients with a documented assessment of their functional capacity in the previous 12 months (from 21.5 to 20.4%)** (Figure 20). This, however, was not consistent across all sectors or practices, with a small increase in NYHA recording being observed in 37% (*n*=10) of the GP practices.

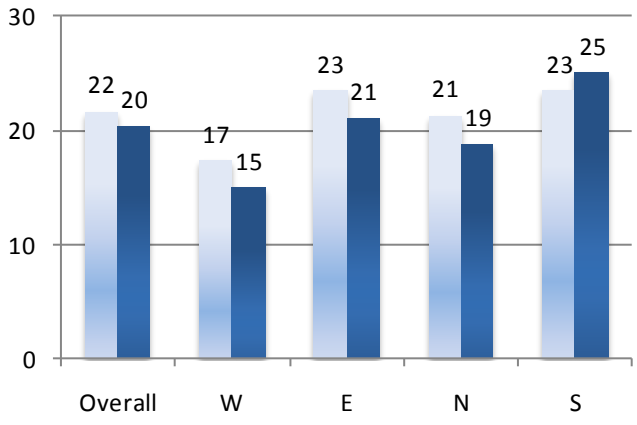



**Figure 20. Overall, and for each sector, the proportion of HF patients whose functional capacity has been assessed and documented using the NYHA classification in the previous 12 months**

### *3.5.3. Psychosocial monitoring*

As a known risk factor for cardiovascular disease, patients with HF should be strongly advised not to smoke and their smoking status should, therefore, be routinely monitored. In addition, it is recommended that, particularly in view of its negative inotropic effects, patients should be advised to limit their alcohol intake. At reaudit, modest increases were observed across NHS Bury CCG in the proportion of patients on the HF register with a smoking and/or alcohol status recorded in the previous 12 months. The proportion of patients whose **smoking status** had been checked **increased from 71.7 to 74.0%** and the proportion having their **alcohol status** checked from **49.0 to 52.9%**. However, again, increases were not consistently observed across all of the CCG sectors. The recording of smoking and alcohol status increased at 17 (63.0%) and 21 (77.8%) of the 27 GP practices respectively.

The prevalence of clinically significant depression in HF patients is high at 20% and is associated with increased morbidity and mortality. The clinical monitoring of patients with HF should therefore include routine screening for depression. At reaudit the proportion of HF patients recorded as having been **screened for depression within the previous 12 months decreased from 51.3 to 44.2%** (Figure 21). This decrease was consistent across all CCG sectors and observed in 70.4% (*n*=19) of practices.

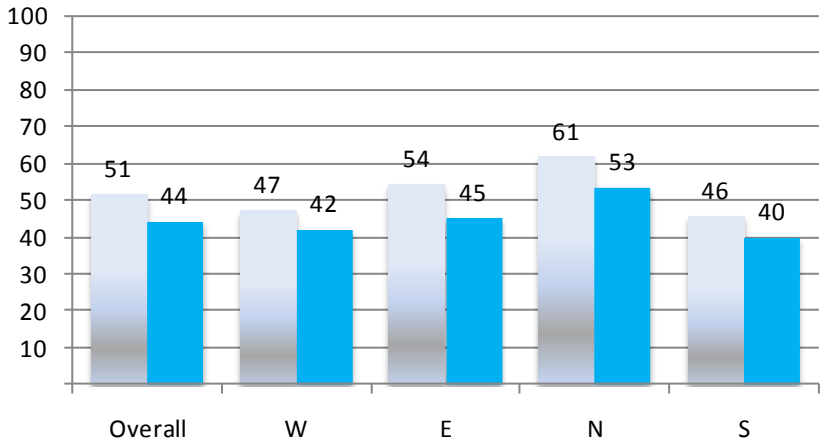



**Figure 21. Overall, and for each sector, the proportion of HF patients screened for depression in the previous 12 months.**

### *3.5.3. Immunisation status*

All patients with HF should be offered an annual vaccination against **influenza** and a **pneumococcal vaccination** on a single occasion. A small reduction was observed over the course of the project in the proportion of HF patients documented as having received or declined these vaccinations (**influenza: 88.0 to 84.9%; pneumococcal: 76.5 to 75.7%**). These reductions, however, were not consistently observed across all sectors or practices (Figures 22 and 23).

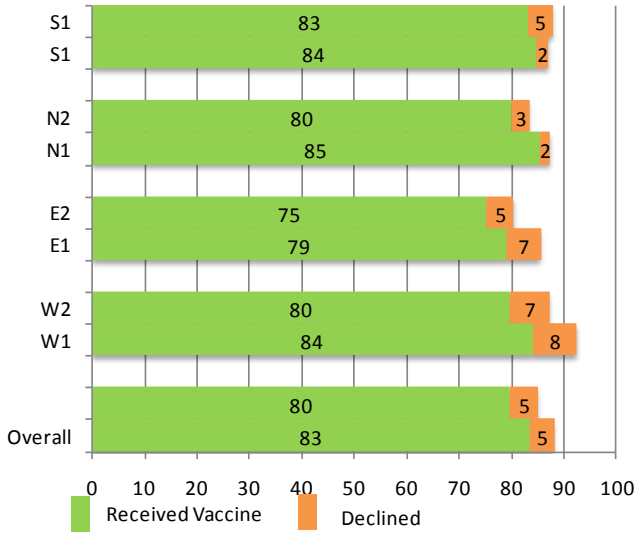



**Figure 22. Overall, and for each sector, the proportion of HF patients with an influenza vaccination in the previous 12 months**

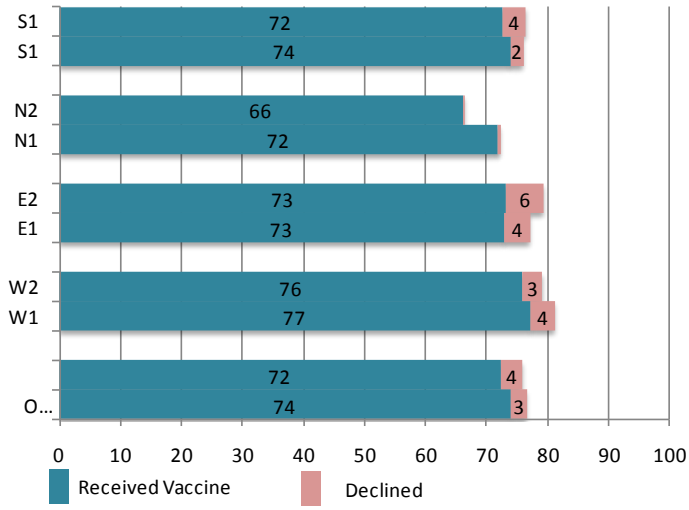



**Figure 23. Overall, and for each sector, the proportion of HF patients with an pneumococcal vaccination in the previous 12 months**

### *3.5.4. Supporting self-management*

Providing education and involving patients in the monitoring of their own condition is a key part of successful HF management and can have a significant positive effect on patients' symptoms, functional capacity, well-being, mortality and prognosis. This can range from simple interventions, such as providing patients with information about their diagnosis and the symptoms and signs that may indicate deterioration in their condition, to getting patients to actively monitor and record their weight and fluid intake on a daily basis.

At reaudit, an increase in the proportion of HF patients documented as receiving **self management support** (**from 21.4 to 30.4%**) and **information about nutritional intake** (**from 22.1 to 30.6%**) was observed. This increase was consistent across all of the sectors (Figures 24 and 25). Increases were seen in 70.4% (*n*=19) and 74.1% (*n*=20) of GP practices for self management advice and nutritional information respectively.

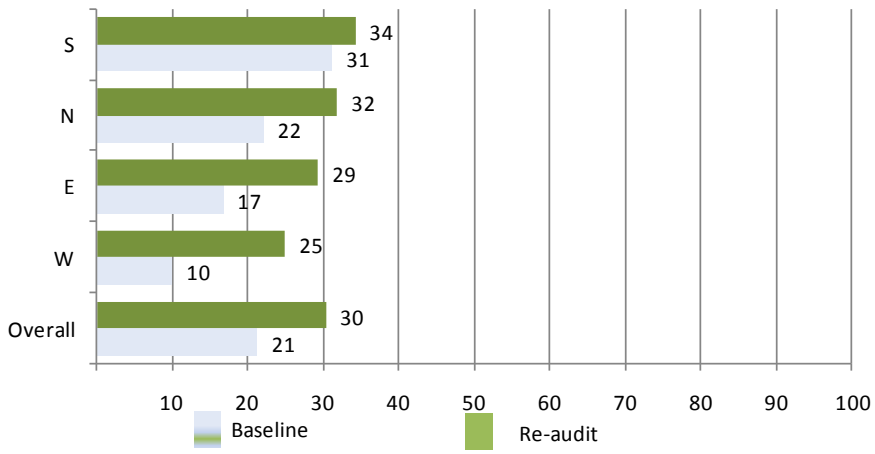



**Figure 24. Overall, and for each sector, the proportion of HF patients documented as receiving self-management support**

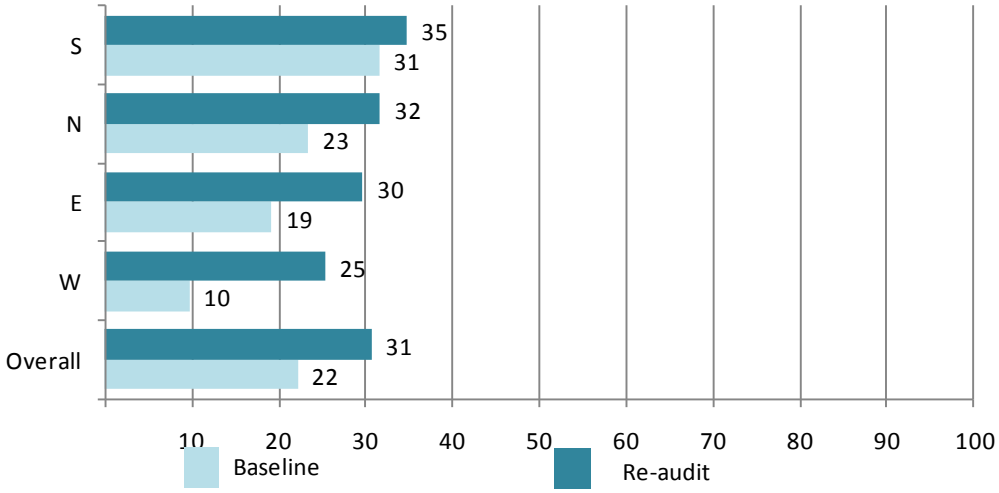



**Figure 25. Overall, and for each sector, the proportion of HF patients documented as receiving nutritional information**

# 4. Discussion and Recommendations

This section discusses the main conclusions of the evaluation and provides recommendations, where applicable, regarding future work that is, or may be, required in NHS Bury CCG to maintain and build on improvements achieved over the course of the project.

### 4.1. Heart failure prevalence

At the start of the improvement project, at 0.65%, reported HF prevalence across participating GP practices was lower than national HF prevalence and significantly lower than the expected HF prevalence of 1 to 2% described by the British Heart Foundation (2010). As a direct result of the activities conducted within the project reported here, in particular the case finding component of the work, a highly significant increase in HF prevalence was observed, with reported HF prevalence upon conclusion of the project averaging at 0.92%. Reported HF prevalence, however, ranged significantly between practices, from 0.26 to 1.54%.

In two GP practices a small decrease in HF prevalence was observed between the initial baseline audit and the reaudit exercise. As the data collected at reaudit represents a snapshot at a single time point, it is conceivable that, following the feedback session, these practices completed the actions required from the register verification element of the work, removing inappropriate patients from the HF register and thus decreasing reported HF prevalence, but, at the point of reaudit, were yet to add patients to the register who had been identified by the case finding process as having a confirmed diagnosis of HF, or requiring further investigation. Where practices, in this way, completed the actions resulting from the register verification exercise prior to those from the case finding process, a 'J curve' would be anticipated, with reported HF prevalence initially falling before rising to a point higher than the starting point. Over the coming months, therefore, it is possible that a rise in reported HF prevalence may be observed at practices where a decrease in prevalence was seen at reaudit. Similarly, it is also possible that, at practices where an increase in HF prevalence was observed over the course of the project, reported HF prevalence may continue to rise as they carry on completing recommended actions from the case finding element of the project, such as adding patients to the HF register and investigating those with signs and symptoms of HF.

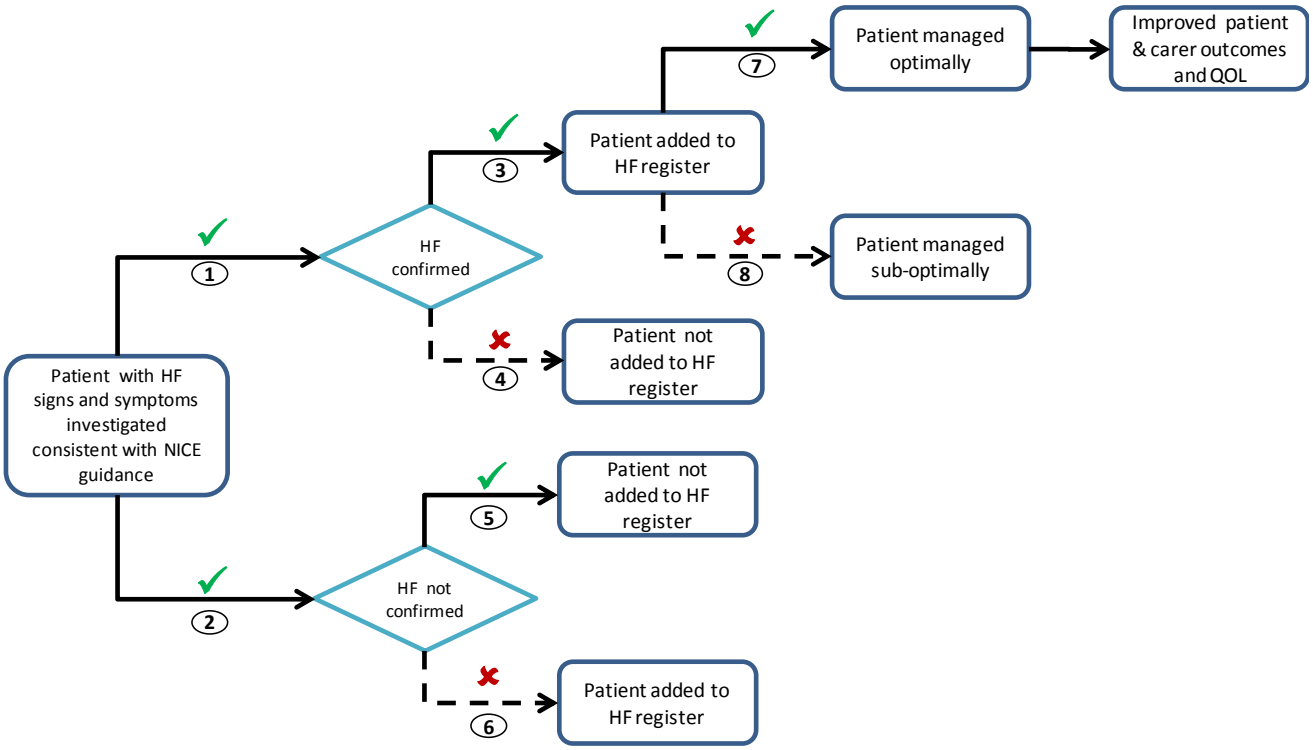
In contrast to the trend described above, it is also possible that the HF prevalence identified at reaudit may be over-reported for several practices. This situation may arise if practices complete the actions from the case finding process prior to the removal from the register of those patients identified through the register verification process to not have a confirmed HF diagnosis. The presence of a continuing number of patients at reaudit considered to be inappropriate for the HF register or to require further investigation would serve to suggest that this may be the case for several practices. In such circumstances, a small decline in reported HF prevalence would be anticipated in the near future, as practices remove and investigate patients who were identified at baseline as being inappropriate for the HF register or requiring further investigation. However, analysis of the baseline verification and case finding results indicates that, even where this is the case, after all actions have been completed, reported HF prevalence will still be anticipated to be higher than that observed at the start of the project.

### 4.2. Heart failure register validity

A significant improvement in the validity of practice-held HF registers was observed over the course of the project. At the time of the initial baseline audits, across participating practices over a quarter of patients on the HF registers did not have a confirmed diagnosis of HF, being considered inappropriate for the register or to require further investigation. At reaudit, however, this had decreased, with only 13% of patients on the HF register not having a confirmed HF diagnosis. While this falls short of the project objective of ensuring that 100% of patients on practice HF register have a confirmed diagnosis, it still represents a considerable improvement.

The observed improvement in the validity of practice HF registers was principally attributable to the addition of patients who had been identified through the case finding process as having a confirmed diagnosis of HF. This, however, was also supplemented by an improvement of the validity of the diagnoses of patients who had been on the HF register at the start of the project, indicating that a number of practices actively removed patients from the register where they were considered to not have a diagnosis of HF. Further improvements in the validity of practice HF registers may be observed as practices continue to work through the actions arising from both the register verification and case finding elements of the GM-HFIT project.

It is of concern, that, at reaudit, patients investigated for HF were still being added to the HF register despite no confirmation of a diagnosis or indeed evidence to the contrary (step 6 on the project logic diagram below). While the proportion of 'new' patients considered appropriate for the HF register was greater than the proportion of patients on the register at baseline with a confirmed HF diagnosis (75.8% vs. 71.1%), this data would serve to indicate that, despite the improvement reported at reaudit, following completion of the project, the validity of HF registers may steadily decline as 'new' patients continue to be added to the HF register inappropriately.



Analysis of data pertaining to those patients, at baseline and reaudit, on the HF register identified as inappropriate or requiring further investigation exposed a number of probable reasons why patients were, and are, being added to the HF register in the absence of a confirmed diagnosis. These reasons are documented in the box 1 below. Patients were most frequently added to the HF register in error where an echocardiogram report documented the present of valvular abnormalities (e.g. mitral or atrial regurgitation) in the absence of HF, thus representing a misinterpretation of the report. Although it is not possible to ascertain confirmation from the data, it is possible that this may occur more frequently in those practices where clinical letters and investigation results are Read-coded by individuals of a non-clinical background. In other cases, it was noted that patients may have been added to the HF register in the absence of a confirmed diagnosis due to difficulties accessing echocardiography services, such as those who are housebound. In appreciation of this difficulty and the absence of widespread use of BNP (brain natriuretic peptide) testing, it was considered that these patients should not be on the HF register but should instead be classified using the Read code designated for 'suspected heart failure'. However, it was apparent that there was a lack of awareness of this Read code across all GP practices.

Box 1. Reasons patients may be added to the HF register in the absence of a confirmed diagnosis

- Valvular and other abnormalities documented on echocardiogram reports considered to be indicative of HF.
- Addition to the HF register on the basis of clinical signs and symptoms alone with no further diagnostic investigation, despite being able to access echocardiography services.
- Addition to the HF register on the basis of clinical signs and symptoms alone, where patients are unable to access echocardiography services (e.g. those who are housebound) or decline further investigation.
- Addition to the HF register on the basis of clinical signs and symptoms alone, where the patient has subsequently gone on to have a 'normal' echocardiogram.
- Patient transferred from another practice outside the CCG boundary with a documented, yet unconfirmed, diagnosis of HF.
- Addition to the HF register at a time before echocardiographic investigation was considered a requirement to confirm a HF diagnosis.

*Recommendation 1: Further input and support should be considered across NHS Bury CCG to support the appropriate interpretation and Read coding of echocardiogram reports and the appropriate investigation of patients with signs and symptoms of HF prior to their addition to the register*

*Recommendation 2: Development of a standardised protocol across NHS Bury CCG related to the management patients with suspected HF who are unable to access echocardiography services or who declined further investigation should be considered.*

Of interest, those patients who were inappropriately on the HF register were almost a third more likely to be female than male. Indeed, approaching half of all patients considered to be inappropriately on the HF register at baseline were women over the age of 75. While it is not possible to determine from the data the precise reasons as to why this pattern was observed, exploration of the literature and tacit information gained over the course of the project suggests several potential explanations for this. These include: the longer lifespan of females may mean they are more likely to live to an age where they experience HF signs and symptoms but are unable to access echocardiography services due to

being housebound or unable to travel away from a care home environment; due to their longer lifespan, females may be more likely to have historic diagnoses of HF and to have been added to the HF register before echocardiogram was consider a 'gold standard' diagnostic investigation that was required to confirm diagnosis; elderly woman may be more likely than their male counterparts to present with signs and symptoms synonymous with those associated with HF, such as shortness of breath and leg oedema, but that are attributable to other causes (such as obesity, hypertension secondary to atherosclerotic lesions due to low oestrogen levels).

In addition to identifying patients added to the HF register in error, the project also set out to identify patients with confirmed diagnoses of HF that had not been added to the HF register (step 4 on the project logic diagram). In total, across the participating practices, 625 patients with a confirmed HF diagnosis requiring addition to the HF register were identified. It is likely that many of these patients were 'missed' off the HF register due to simple errors in Read coding. However, between baseline and reaudit, a significant increase was observed in the proportion of patients on the HF register with diastolic dysfunction, suggesting that a number of patients that had been 'missing' from the HF register were those diagnosed of diastolic HF (also known as HF with preserved ejection fraction). This is likely to represent the relative complexity and lack of awareness/appreciation of diastolic HF and its associated diagnostic criteria, which requires not only echocardiographic evidence of diastolic dysfunction but also the presence of ongoing HF signs and symptoms.

Data also serves to demonstrate that, between baseline and reaudit, the proportion of patients on the register with a diagnosis of mild LVSD significantly increased, potentially indicating that many of the 'missing' patients with a confirmed HF diagnosis identified through the case finding process had mild LVSD. While the precise reason for this trend is unknown, it may be due, amongst other reasons, to the contestation of whether mild LVSD constitutes HF and the fact that patients with mild LVSD may be more likely to be managed in primary care and to therefore have minimal correspondence from secondary care services documenting a HF diagnosis that subsequently provides an opportunity for this diagnosis to be appropriately Read coded.

Notably, HF diagnoses were also frequently 'missed' when included in discharge summaries and clinical letters, as opposed to echocardiogram reports, due to the volume of additional information provided in the former, and also anecdotally where the HF diagnosis was stated in terms of ejection fraction without direct reference to 'dysfunction' and/or 'heart failure'. In addition, several patients with HF were found to have potentially been removed inappropriately from the HF register following normalisation of their heart function, for example, attributable to the use of optimal pharmacological therapy. Of interest, a number of patients under the care of the HF specialist nurse were also found to have been 'missed' off the HF register, perhaps due to preconception that addition to the register was not warranted for patients already being managed by specialist HF services.

The reaudit process does not permit identification of whether, since the baseline audit, participating GP practices have 'missed' fewer patients off their practice-held HF registers, but it is likely that all practices, and in particular the individuals within the practices responsible for Read coding, would benefit from further input and support, particularly concerning diastolic HF, mild LVSD and the appropriate interpretation and Read coding of echocardiogram reports.

*Recommendation 3: Consistent with recommendation 1, further input and support should be provided across NHS Bury CCG to support the appropriate interpretation and Read coding of echocardiogram reports, discharge summaries and clinical letters. This should include information concerning the diagnosis and Read coding of diastolic HF and mild LVSD.*

### 4.3. Quality of heart failure management

Between the initial baseline audit and reaudit there was an average seven point increase in traffic light score across participating GP practices, indicative of an improvement in the quality of HF diagnosis and care. Just over half of this increase was derived from improvements in the proportion of patients with a confirmed HF diagnosis and known aetiology.

While an increase in traffic light score was observed at 19 of the 27 GP practices, a small decrease was seen at several of those participating in the project, although all decreases were minimal. A number of reasons have been suggested for this trend, including: a decrease in the proportion of patients on some practice-held HF registers receiving input from HF specialist nurse services; natural/common-cause variation in the quality of HF care; practices having completed the process of adding HF patients to the register, but not having yet addressed the clinical management of these patients. Where the latter is the case, it is possible that an increase in the quality of HF management may be seen over the coming months as practices continue to complete the clinical actions recommended by both the baseline and reaudit processes.

Improvements in the quality of HF management were supported by the provision of clinical education sessions. While the objective of having representation from all participating practices at these sessions was not met, almost 60% of participating practices were represented at at least one of the three sessions held. These sessions were attended by a significant number of GPs, with a high proportion of attendees at each session being GPs. This was considered indicative of the nature of the project's engagement with participating practices, where GPs were often found to be the principal 'recipients' of the project despite promotion and encouragement of a multidisciplinary approach by the GM CLAHRC. In addition to the formal education sessions, however, a session specifically designed for practices nurses was delivered at the local practice nurse forum which provided an excellent opportunity to tailor the content and delivery of the education session to this professional group.

The project objectives also stated an intention to ensure implementation, across all GP practices, of a standard HF review template to support the conduct of standardised, evidence-based six monthly HF reviews in primary care. This, however, was not achieved during the timeframes associated with the project due to changes in the organisation and structure of the NHS which led to significant disruption in the availability of the data quality services that were due to support the development of the template. While the template has now been developed and is being tested in collaboration with several GP practices, further work is required to refine its content and structure and to subsequently support its dissemination.

*Recommendation 4: Continue to pilot and refine primary care HF review template with a view to supporting its roll-out across all of the GP practices that comprise NHS Bury CCG.*

With respect to clinical care, the primary improvement observed was in the proportion of HF patients receiving, or being scheduled to receive, a primary care HF review, either six monthly or annually, as recommended by NICE. The introduction of these reviews facilitated small yet significant improvements across a wide range of clinical process indicators, including the administration of pulse rate and rhythm, oedema and weight checks, recording of smoking and alcohol status and the documented provision of self-management and nutritional education in relation to HF. A small decline was observed in the recording of NYHA status, most likely reflecting the decreased proportion of HF patients receiving HF specialist input and a lack of awareness and adoption of the NYHA classification within the primary care

context. A small yet significant decline was also seen in the proportion of HF patients screened for depression. However, as a high proportion of patients have comorbid HF and CHD, this was believed to be attributable to the removal of the depression screening indicator from the 2013/14 QOF CHD dataset.

Between initial baseline audit and reaudit, a small reduction in the use of ACEI/ARB and BB therapy for patients with confirmed LVSD was seen on average across participating practices, although this was not consistent across all practices. As, in some practices, many patients identified as requiring addition to the HF register were added only shortly before reaudit, this is likely to have been caused by virtue of the fact that these patients were added to the HF register before reaudit yet prior to their commencement on appropriate medication. In contrast to this decrease, however, it was encouraging to observe a small increase, on average across the participating practices, in the proportion of HF patients being treated with these therapies receiving optimal tolerated doses or having, or due to have, their medication up-titrated.

# References

British Heart Foundation Health Promotion Research Group (2010). *Coronary heart disease statistics: 2010 edition*. Oxford: Department of Public Health, University of Oxford.

Department of Health (2013). *Cardiovascular Disease Outcomes Strategy*. London: Department of Health.

GM CLAHRC (2011). *GM-HFIT Primary Care Heart Failure Project*. Available at: http://clahrc-gm.nihr.ac.uk/cms/wp-content/uploads/GM-HFIT-Primary-Care-Heart-Failure-Project-Full-Report.pdf [Accessed: 31 October 2013].

Health and Social Care Information Centre (2012). *Quality and Outcomes Framework 2011-12*. Available at: http://www.hscic.gov.uk/catalogue/PUB08135 [Accessed: 31 October 2013].

Murray, C.L. et al. (2010). UK health performance: findings of the Global Burden of Disease Study 2010. *The Lancet*, 381(9871), pp.997-1020.

National Institute for Cardiovascular Outcomes Research (2012). *National Heart Failure Audit April 2010-March 2011*. London: University College London.

National Institute for Health and Clinical Excellence (NICE) (2010). *Chronic Heart Failure: NICE Clinical Guideline 108*. London: NICE.

Public Health England (2013). *Health Profile 2013: Bury*. Available at: http://www.apho.org.uk/default.aspx?QN=p_health_profiles [Accessed: 31 October 2013].

South East Public Health Observatory (2010). Cardiovascular disease Local Authority health profile: Bury. Available at: http://www.sepho.org.uk/NationalCVD/NationalCVDProfiles.aspx [Accessed: 31 October 2013].

Sutherland, K. (2010). *Bridging the quality gap: Heart failure*. London: The Health Foundation.

# Appendix 1.

**Heart Failure Case Finding Searches**

At the beginning of the project, 20 searches were used within the case finding process to generate a list of patients who may have a confirmed diagnosis of HF but were not on the HF register. These searches were later reduced to the 15 listed below, with several searches being merged during the project.

Patients already on the HF register were excluded from all searches.

| Search No. | Description |
|---|---|
| 1. | (Any Angiotensin Converting Enzyme Inhibitor OR any Angiotensin Receptor Blocker) AND Beta Blocker licensed for HF |
| 2. | Spironolactone AND Eplerenone |
| 3. | Metolazone |
| 4. | Ivabradine |
| 5. | Coronary Heart Disease AND Echocardiogram |
| 6. | (Atrial Fibrillation OR Atrial Flutter) AND Echocardiogram |
| 7. | Cardiomyopathy |
| 8. | Cardiomegaly AND Echocardiogram |
| 9. | (ECG Abnormal OR Left Bundle Branch Block) AND Coronary Heart Disease |
| 10. | Echocardiogram Abnormal |
| 11. | Left Ventricular Systolic Dysfunction |
| 12. | Left Ventricular Diastolic Dysfunction |
| 13. | Suspected Heart Failure |
| 14. | Pacemaker *in situ* |
| 15. | Internal Cardioverter Defibrillator (ICD) |