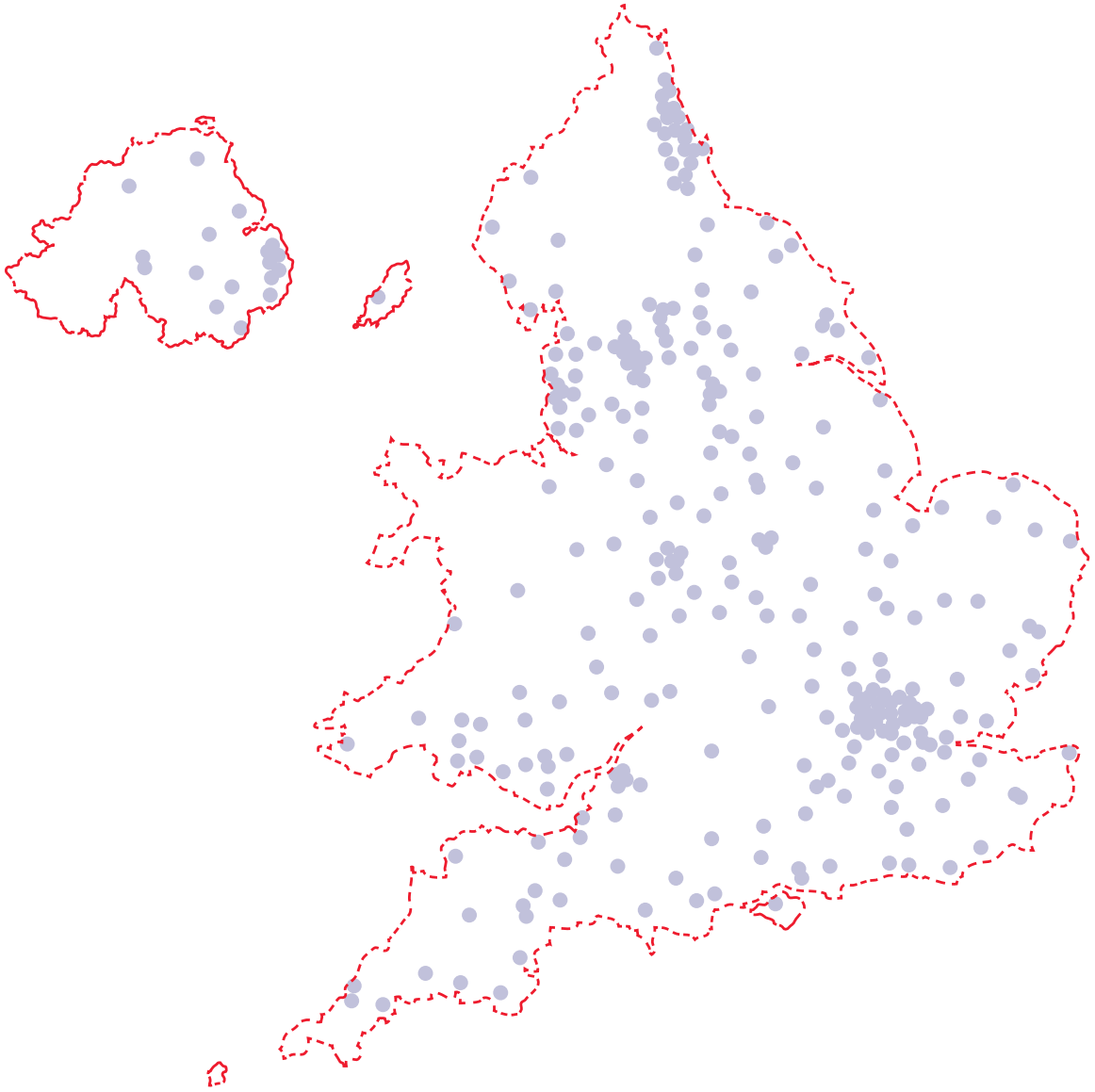
British Heart Foundation

The National Audit of Cardiac Rehabilitation

Annual Statistical Report 2009



BEATING HEART DISEASE TOGETHER

The cover shows the Cardiac Rehabilitation programmes of England, Wales and Northern Ireland.

The National Audit of Cardiac Rehabilitation

The National Audit of Cardiac Rehabilitation (NACR) is funded by the British Heart Foundation (BHF) working with the BHF Care and Education Research Group at the University of York, and the staff who run the rehabilitation programmes and collect the data. The aims of the audit are to

- show locally and nationally what cardiac rehabilitation services are achieving and where those services are not fully developed
- identify problems of inequitable provision for particular sections of the population
- describe the typical benefits that a patient should expect
- find out which ways of delivering cardiac rehabilitation are most effective
- make local information available to providers, cardiac patients and the general public.

It has two main components: an electronic database that staff use to input data electronically and an annual paper survey that collects data from those centres not yet linked electronically (40%).

Forewords

The third National Audit of Cardiac Rehabilitation (NACR) shows significant reductions in waiting times for cardiac rehabilitation and an improvement in the range of professions available to patients, particularly dieticians, pharmacists, psychologists and occupational therapists. However, there was no improvement in the number of patients taking part in rehabilitation following a major cardiac event. Once again the audit shows us that across England, Wales and Northern Ireland, the uptake of cardiac rehabilitation remains far too low at 38% for heart attack (MI), elective angioplasty (PCI) and coronary artery bypass surgery (CABG).

It is striking to note the benefits for those patients attending cardiac rehabiltation, particularly in their levels of regular exercise and measures of health-related quality of life. It is of concern that patients with particular needs, such as those with anxiety or depression, do not seem to be getting the support they need, and that women are not taking part to the same extent as men.

The audit suggests that the main reason for this is largely due to a failure to deliver a robust patient pathway, where rehabilitation is seen as a vital part of every patient's treatment, rather than an optional extra. The BHF is calling for the renewal of national approaches to cardiovascular disease, to ensure that areas of unfinished business, like cardiac rehabiliation, get the prioritisation they deserve.

The audit is only made possible through the dedication of the clinicians doing the face to face work with patients. The majority have no audit or administrative support and many work to collect the data in their own time. I am aware that this work is begining to stimulate a great deal of interest and activity - from patients and health care professionals to cardiac networks and politicians - and I hope that the improvements noted above are the first signs of a genuine improvement to come.

Dr Mike Knapton
Associate Medical Director
British Heart Foundation

The cardiac rehabilitation community should be congratulated for significantly higher return rates to the audit which has led to a much clearer picture of rehabilitation services. This year's data will strengthen our case for greater access and equity to what we all know is an evidence-based and valued service. I would urge those programmes that are still struggling to provide data to prioritise local administrative resources and to use the NACR team's expertise to set up a full audit system.

The NACR findings are starting to influence national decision making and have recently contributed to a change in BACR thinking on staffing, culminating in the release of a statement on staffing for cardiac rehabilitation programmes.

The figures for cardiac rehabilitation uptake continue to be roughly the same as last year. Inequity in provision and uptake continues to exist within regions. The range for referral and uptake from PCI procedures to cardiac rehabilitation programmes (19% to 50%) is of particular concern.

These finding are disappointing. We cannot blame poor uptake purely on a lack of funding as many of the interventions used, during the year of this audit, incorporated cardiac rehabilitation reference costs into their procedures. Closer liaison with local commissioners and cardiology colleagues is really important in ensuring that services are funded appropriately and referral pathways are optimal.

Reasons to celebrate include reduced waiting times and improved weekly exercise trends. Positive outcomes for health related quality of life reinforce the message that cardiac rehabilitation outcomes are transferable into daily life. One of the longer term benefits from cardiac rehabilitation is that physical activity remains high which fits well with effective rehabilitation, sound risk factor management and overall prevention of disease.

The BACR will continue to work with the NACR Team, and thanks the University of York team for their hard work.

Professor Patrick Doherty
President, British Association of Cardiac Rehabilitation (BACR)

What is Cardiac Rehabilitation?

Cardiac rehabilitation is a structured programme of care designed to help heart patients recover quickly and improve their overall physical, mental and social functioning. The ultimate goal is to help patients slow or even reverse the progression of disease through changes in lifestyle and appropriate use of their medication, thereby reducing the risk of heart disease or another cardiac episode. Many people are shaken when they realise that they have a life-threatening illness and an equally important part of rehabilitation is to help patients overcome their fears and become fully active and integrated into society.

Cardiac rehabilitation programs vary in length, content and the place of delivery. Increasingly, there is a drive to offer patients a choice, for example between home, a community resource such as a leisure centre or in hospital. All programmes should include:

- an assessment of a patient's rehabilitative need, physical, psychological and social
- a negotiated plan as to how these needs can best be met
- education as to the causes of the illness and those things that can help to ensure that the patient enjoys the best possible health in the future
- an assessment of the patient's activity levels and a plan to increase both physical fitness and habitual physical activity to recommended levels
- help in making crucial lifestyle changes such as smoking cessation, weight loss and an improved diet

Cardiac rehabilitation should be seamless, taking a person through from finding out they have a heart problem to achieving long-term lifestyle changes. It has been described as having four *Phases*, Phase I is prior to discharge from hospital, Phase II is the period between discharge and waiting to start a 6-12 week Phase III programme, and Phase IV is long term maintenance of health behaviour change, usually in the UK through special facilities provided at leisure centres or gyms in the private sector. Some patients do not receive all of the Phases and therefore have an incomplete rehabilitation experience.

Why is it important?

- More than 48 randomised controlled trials have shown that people who attend cardiac rehabilitation are likely to live longer than those who do not. In fact for many patients cardiac rehabilitation is one of the most effective and cost effective treatments available.
- A longer life is desired by most people, but a longer more miserable or restricted life is not. Cardiac rehabilitation can improve people's lives through reducing symptoms, helping them regain the ability to take part in activities they enjoy, be less dependent on others and through knowing that they are fighting back against a frightening disease.

Summary of main findings

The 2009 Audit Report covers the period between April 2007 and March 2008. During that time the number of cardiac rehabilitation programmes providing patient level data electronically rose from 126 to 200 and we received a 97% response to the paper-based survey that captures data from those centres not yet using the database. This reduced the need to estimate 'missing data' so that we believe this to be the most accurate picture of the provision so far.

This year the report covers only England, Northern Ireland and Wales because, following consultation between the Scottish Government, NHS QIS and the Scottish Information Services Division, cardiac rehabilitation will be one of the first services in Scotland to have an ongoing electronic audit. The BHF / BACR minimum dataset has been incorporated into this so that the results can be fed into future NACR Annual Reports.

The full report can be downloaded from *bhf.org.uk/cardiacrehab*

or from *www.cardiacrehabilitation.org.uk/nacr*

Uptake of Cardiac Rehabilitation

There was no increase in the percentage of patients who took part when compared with last year's audit.

Around a third of all people (34%) who had a heart attack, and 30% of angioplasty patients in England, Northern Ireland (NI) and Wales in 2007-8 took part in a cardiac rehabilitation programme. As in previous years, the percentage of bypass patients attending was much higher at around two thirds. Taking heart attack (MI), angioplasty (PCI) and bypass surgery (CABG) patients together, 51,232 of the 135,294 patients in England, NI and Wales took part.

Once again there was evidence of a postcode lottery both in the opportunity to attend and in the level of staffing. In England, the North East and North West Strategic Health Authority areas are the best served for cardiac rehabilitation with around 40% of MI patients, 90% of CABG patients and 50% of PCI patients attending cardiac rehabilitation. Across the three nations, PCI patients had the greatest variation (from 9% to 32%).

Referral to Cardiac Rehabilitation

There was also no increase in the percentage of patients referred to cardiac rehabilitation.

Around 27% of patients who were referred to cardiac rehabilitation and entered into the NACR database did not take part. Of these, around a third were recorded as being 'too ill', 'having further investigations' or as 'physically incapacitated'. It is worrying that a further third were 'not interested'.

The great majority of those who were well enough and were offered rehabilitation took up the offer and a previous survey by the Healthcare Commission of cardiac patients recently discharged from hospital[1] showed that the main reason patients gave for not having attended was that they were unaware that it was available.

[1] BMJ 2005;330:1346

Wait times

The time patients waited to start cardiac rehabilitation has declined in each of the three years of the audit. The greatest reduction occurred in 2006-7 when the British Heart Foundation and the BIG Lottery Fund put £4 million into cardiac rehabilitation to improve access and quality. In this audit, the median wait time was three weeks for MI patients, a month for PCI patients and six weeks for CABG patients: across all three groups there was a reduction of ten days from the previous year.

Under-represented groups

The majority of those who took part were white British males between the ages of 61 and 70 who had recently experienced an MI or revascularisation (PCI or CABG).

There was no increase in the number of people with heart failure, angina, acute coronary syndrome (ACS) or implanted devices being referred to cardiac rehabilitation. Only 1% of the patients were referred because of heart failure, 4% for angina and less than 1% for those having received an implanted cardiac device. A part of the explanation is that a quarter of programmes routinely exclude people with heart failure and nearly a fifth exclude people with an implanted cardiac defibrillator or angina. It is clear that there has been a failure to incorporate cardiac rehabilitation into the routine treatment pathways of cardiac care as set out in national strategies.

Women are under-represented in cardiac rehabilitation both at referral and in the number actually taking part. If men and women were entering rehabilitation in proportion to the case rates for MI we would expect there to be 63% men and 37% women in programmes. Instead we found that women made up 32% of referrals and only 28% of participants. If the take-up rate for rehabilitation had been equal, even with the current level of the service, we estimate that another 2000 women would have benefited from rehabilitation in 2007-2008. It is mainly older women who are under-represented in cardiac rehabilitation; women after the age of 80 are less likely to take part than men of the same age.

Cost and staffing

We used the Scottish Intercollegiate Guideline Network (SIGN) guidelines for Cardiac Rehabilitation as a standard to measure staffing, because it provides a ratio of staff to patients and the BACR and NICE guidelines are based on this standard. There appears to have been an increase in the range of professions available within cardiac rehabilitation programmes, notably an increase in access to dietetics, pharmacy, occupational therapy (OT) and psychology, but none of the programmes were staffed at the recommended level. Thirty nine per cent of programmes had no clerical support, taking professional staff away from patients and imposing severe difficulties in carrying out this audit. Thirty four per cent had no dietetics input and 66% no dedicated psychology time.

Benefits that accrued over the course of the programmes

The most striking change in people attending cardiac rehabilitation is the effect on physical activity levels, maximum level of effort and health-related quality of life. There was a 19% increase in the number of people exercising five or more times a week and a 29% reduction in those who never exercised. The number of people who reported smoking decreased, from 12% to 7%. Quality of Life scores improved very significantly. The biggest gains were in physical fitness, overall health, social activities and daily activities. However, there was no improvement in the percentage of patients who were obese (29%).

Psychological support

In all national and international guidelines it is recognised that an important part of cardiac rehabilitation is alleviating the anxiety and depression that often accompanies heart disease. We found that 17% of patients were borderline or clinically depressed and 28% of patients had similar incidence of anxiety. There was only a small improvement in these figures three months after starting rehabilitation and no sign of any further improvement at 12 months. Despite this fewer than 3% of patients were recorded as having had individual psychological help or counselling.

Recommendations

1. Rehabilitation should be an integral part of the patient pathway with robust referral mechanisms both for patients admitted to hospital as well as for those identified in primary care as living with a cardiac condition.
2. The organisations and regulatory bodies charged with maintaining quality of care in the NHS, at both the national and regional levels, should use NACR data and work with local providers to ensure consistent standards that meet those set out in national strategies.
3. There are large differences in performance between Strategic Health Authorities and Local Health Boards, with some doing much better at meeting the needs of their patients than others. There is an opportunity for sharing knowledge of best practice across these areas.
4. Commissioners of healthcare should carry out a local needs assessment to ensure that sufficient resources are available for all groups of cardiac patients known to benefit from good quality cardiac rehabilitation.
5. The barriers that prevent older women, people with heart failure and other cardiac groups taking part in cardiac rehabilitation should be studied and if necessary, programmes and delivery methods should be redesigned to accommodate these groups.
6. Patients requiring psychological treatment should be identified and referred to appropriate help.

Professor Bob Lewin for the NACR Team
BHF Care & Education Research Group
University of York

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Acknowledgements

The British Heart Foundation funds the NACR and the National Campaign for Cardiac Rehabilitation.

This project would not be possible without the continuing dedication of the staff of the cardiac rehabilitation programmes of the UK or the patients who completed the questionnaire. This year, staff collected data on more than 63,000 patients despite the fact that due to inadequate secretarial and administrative resources they often have to use their own time to conduct an audit.

Many people have provided support and endorsement for the project, notably Professor Roger Boyle, Dr Mike Knapton and Betty McBride have spoken in public meetings and in committees to support the work of the audit. Two patient representatives, Mr Mel Clarke and Mr David Geldard, have worked tirelessly to support and advise us.

We are grateful to the following people who make up the NACR Steering Group:

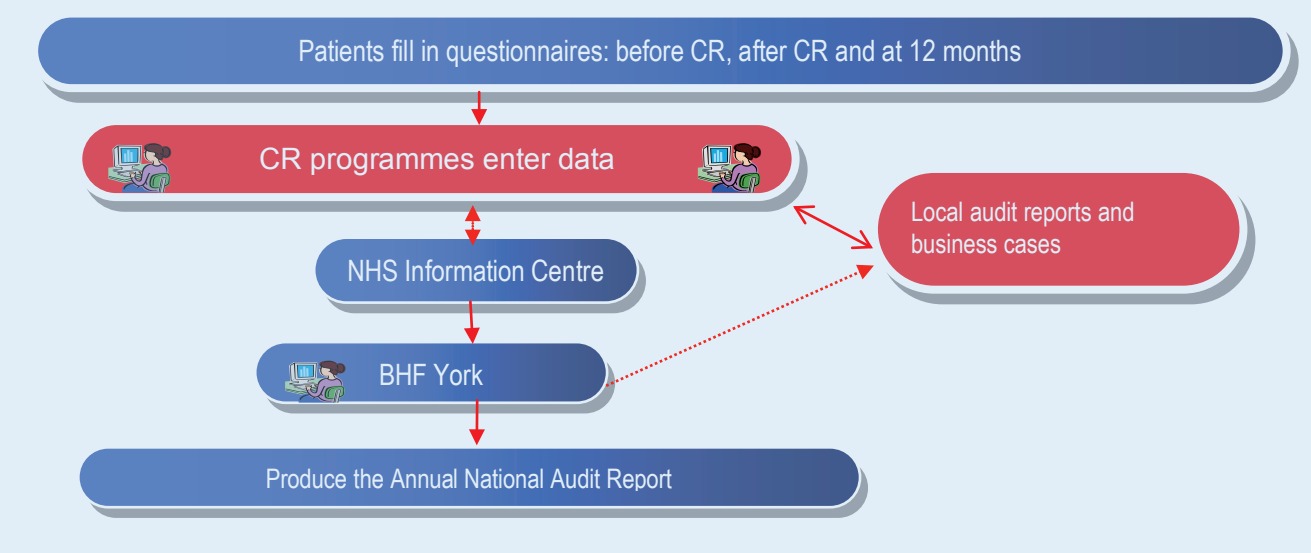
Linda Binder, Dr John Birkhead, Professor Nick Black, Mel Clark, Nicki Cooper, David Cunningham, Professor Patrick Doherty, Karen Dunderdale, Linda Edmunds, Nadeem Fazal, Dr Jane Flint, Shirley Hall, Helen Laing, Elizabeth Lynam, Liam McLaughlin, Sally Turner and Professor Peter Weissberg.

Section 1 Questions about uptake, quality and outcomes

How is the data collected?

Patients complete a questionnaire pack before, immediately after and (where resources allow) 12 months after attending rehabilitation. As well as medical and demographic information this captures secondary prevention, psychological and quality of life information.

The staff of the cardiac rehabilitation (CR) programmes enter the data which is then uploaded to the NHS Information Centre. Programmes can also view and download their data for local analysis. Two hundred and forty-seven programmes are currently submitting data, around 65% of the cardiac rehabilitation programmes of the UK and the survey achieved a 97% return rate.



Anonymised data is downloaded by staff of the BHF Care and Education Research Group who

- provide every centre with a quarterly summary of their activity and patient outcomes
- produce 'one off reports' as requested by staff or funders to improve local services
- produce the annual National Audit Report and support with statistical information the four nation campaigns for CR and the BACR Council in representing the service locally and nationally.

How many CR programmes are there in England, Northern Ireland and Wales?

What did we find? The number of CR programmes on the BHF/BACR register of CR programmes has increased from 374 in the last audit report to 382. This is most likely to be due to factors such as more Phase IV programmes registering, changes in how services are split between primary and secondary care and further centres coming forward to create a more accurate register (see Table 17 on page 24).

Method The NACR staff at York maintain the online BHF / BACR National Register of CR Programmes for the UK.

Table 1. CR centres in England, Northern Ireland and Wales in 2007-8

	Number of centres
Combined	341
England	298
N. Ireland	16
Wales	24
Isle of Man and Channel Islands	3

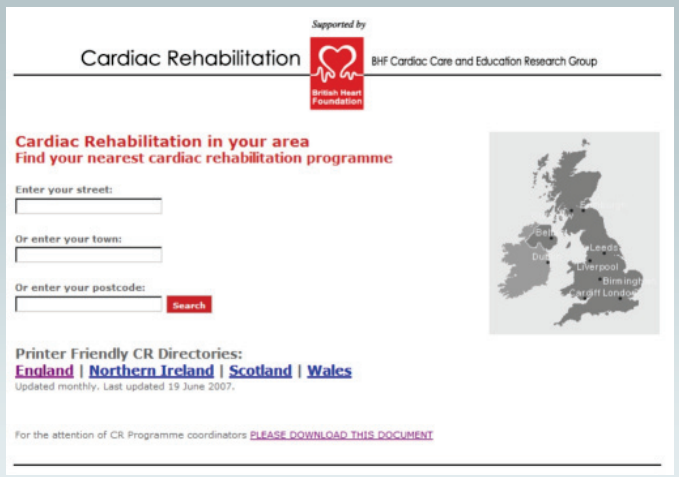
*Three centres in England had their CR service suspended during this period and are not included in this report

The online register is at **www.cardiac-rehabilitation.net**
Anyone can use it to search for the four nearest rehabilitation programmes to a postcode, town or street name.

The register can be downloaded as a PDF file.

This register is updated regularly from information entered by the CR programmes and the NACR team at York.

There is also a searchable Google Map showing where the programmes are across the UK at www.cardiac-rehabilitation.net.



Which patient groups are being referred to CR?

What did we find?

As in the previous year referral to CR was almost entirely restricted to people in three main diagnostic groups: those who had sustained a heart attack (MI), elective angioplasty (PCI) or coronary artery bypass surgery (CABG). There has been no improvement in the last three years in the percentage of people in other diagnostic groups who are referred.

Around a third of those referred were clinically obese. A third had a Systolic BP >140 or Diastolic BP >90, 17% were smokers, 69% did not meet the national recommendations for exercise and nearly 20% were either borderline or clinically depressed.

Why is this important?

Research has shown that people with heart failure, implanted cardiac devices and people with chronic stable angina benefit from CR.

In England, the National Service Framework states that these patients should be invited to take part and the Welsh Framework states that all people with 'established heart disease' should be offered a programme.

Method

We used the NACR database data which includes the 'reason for referral'.

Further information

Table 31 in Section Two shows all of the 'reasons for referral' recorded in 2007-8

Table 2. The main diagnostic groups and the % of the total by group in the NACR database

Diagnosis	*2006-7**	*2007-8***
MI	51%	49%
CABG	16%	16%
PCI	13%	15%
ACS	6%	5%
Angina	4%	4%
Heart Failure	1%	1%
ICD patients	<1%	<1%
All others	9%	10%

(*N=44,307, **N=71,324)

Table 3. Risk profile of patients referred to CR as recorded in NACR in 2007-8

% BMI > 30	28%
% Systolic BP >140 or Diastolic BP >90	28%
% Smoking	17%
% Less than 5 episodes of moderate exercise for 30 mins per week	69%
% Borderline or clinically depressed	19%

(N=46,097)

Which patient groups are excluded from CR?

What did we find?	A significant number of programmes explicitly exclude people with certain heart problems. A quarter of programmes excluded people with heart failure or with a pacemaker and nearly a fifth excluded people with an implanted cardiac defibrillator or angina.
Why is this important?	Research has shown that people with heart failure, implanted cardiac devices and people with chronic stable angina would also benefit from CR.
Method	We asked all CR centres which groups they 'don't typically accept' in their programme.
Caveats	It is possible that in a few cases the exclusion may be because centres cross-refer such patients to another centre.

Table 4. Number and percentage of centres who reported a policy of not accepting certain diagnoses for Phase III rehabilitation

Diagnosis	*N*	*(%)*
Pacemaker	84	26%
Heart failure	81	25%
Implanted cardioverter-defibrillator	71	22%
Angina	66	20%
Acute coronary syndrome	45	14%
Cardiac arrest	43	13%
Surgical (ex. valve or CABG)	32	10%
PCI	24	7%
Valve surgery	24	7%

Number of Phase III programmes, N=322

What percentage of MI, PCI and CABG patients attended CR in England, Northern Ireland and Wales?

What did we find?

There has been no improvement in the percentage of patients taking part in CR. Only around a third of the people who had a heart attack or angioplasty in England, Northern Ireland and Wales in 2007-8 took part in a CR programme. As in previous years the percentage of post-bypass patients was much higher at around two thirds.

We found a reduction in the number of patients who took part but we believe that this is most likely to be a function of the increasing accuracy of the audit rather than an actual reduction in numbers. As more CR programmes begin to submit data electronically or complete the annual paper survey we were able to use less estimated data.

Method

We compared the numbers reported as having rehabilitation with the number of 'cases' reported in the various national statistical agencies.

Caveats

Some centres were unable to break down the patients they had seen by reason for referral. For 14% these were calculated using the average proportion for that country. Ten centres (3%) did not provide usable data.

Further information

Section 2 gives further detail of the methods used and presents tables and illustrations mapping the uptake by Strategic Health Authorities in England, by Health Board in Northern Ireland (where data completeness allowed) and in Wales by Cardiac Network.

Table 5. Numbers and percentages of patients in the three main diagnostic groups attending CR in England, Northern Ireland and Wales

Reason for referral	*No. of cases*	*Receiving CR*	*% uptake*
MI	83,540	28,514	34%
PCI	32,807	9,830	30%
CABG	18,947	12,888	68%
Total	135,294	51,232	38%

Are the Department of Health's National Service Framework targets for England being met?

What are the targets?	In 2000 a target was set for England that, by 2002, 85% of patients who have had a heart attack (MI), angioplasty (PCI) or coronary artery bypass surgery (CABG) would be invited to attend CR. After that had been achieved, CR would be rolled out to all other cardiac patient groups, apart from those with unstable conditions.
What did we find?	There was no increase in the number of people taking part in rehabilitation since the last audit year 2006-7. Many programmes do not have the resource to enter all of the patients referred and may not know the number of patients who were told about the rehabilitation programme. As a result all we can report with any certainty is the number who took part. It is clear that the percentage of people taking part is very low compared to the number of people who might have taken part. It is also clear that progress towards the goal that rehabilitation should be extended to heart failure and other groups of patients with heart disease has not started.
Method	We compared the numbers reported as having rehabilitation with the number of 'cases' of MI, CABG or PCI reported by the various national statistical agencies.
Caveats	Some centres were unable to break down the number of patients they had seen by reason for referral, the missing data was calculated using the average proportion for each of the three nations. Ten centres (3%) did not provide usable data and were excluded. This may have produced a slight underestimate.
Further information	Pages 40-46 present tables and maps showing uptake rates and degree of estimated data by Strategic Health Authority in England or Cardiac Network in Wales. Because of the small number of programmes in each Health Board in Northern Ireland, as in previous reports, we have presented the figures for the whole country only and not provided a map.

Table 6. Uptake of CR in England for MI, PCI and CABG patients

	Uptake 2006-7	*Uptake 2007-8*
MI	42%	35%
PCI	31%	32%
CABG	73%	67%
Total	44%	38%

Are some demographic groups under-represented in CR programmes?

What did we find?	There was no change in the profile of those attending rehabilitation. The great majority were white British, retired men in their mid to late '60s with MI, PCI or CABG. Very few people from the major ethnic groups or those recorded as permanently sick or disabled were referred.
Why is this important?	It has often been suggested that women, the elderly, people from ethnic minorities and disabled people are not attending in the numbers that would be expected.
Methods	We use the data entered in the NACR electronic database.
Further information	The table showing the demographic data of those referred can be seen in Section two.

Table 7. Percentages of referrals recorded in NACR database

Group	*Referred 2006-7**	*2007-8***
Women <70	13%	13%
Men <70	44%	44%
Women >70	17%	17%
Men >70	26%	26%
Not recorded as White British or Irish	23%	24%
Average age	67	67
Number over 80 years	15%	15%
Permanently sick or disabled	5%	4%

(*N=44,306, **N=71,324)

Are women with MI under-represented in CR programmes?

What did we find?

If, after a heart attack, men and women attended rehabilitation in equal proportion we would expect there to be 63% men and 37% women in programmes. Instead, we found that 72% male and 28% females took part. If the take up rate for rehabilitation had been equal we estimate that another 2,000 women would have benefitted from rehabilitation in 2007-2008.

The average age of women taking part was greater than that of the men. A third of all women who took part were 80 years or older, they were less active, more likely to have a BMI >30 and much more likely to be 'borderline' or clinically anxious or depressed.

After rehabilitation women were very slightly less likely to meet the nationally recommended activity level than men but they had a slightly greater improvement in anxiety and depression. They made the same, very significant, improvements in quality of life.

Why is this important?

It has often been suggested that women attend rehabilitation less than would be expected but until now there has been no conclusive evidence that this was the case.

Methods

We know the number and proportion of women and men having a heart attack. Using the NACR database we explored the proportion of men to women taking part in CR, differences in the reasons for not taking part and the demographic characteristics of those who do and do not take part by gender.

Further information

The outcomes of CR that were significantly different between males and females (Table 45) and the age distribution by gender (Figure 1) are shown in Section two.

Table 8. Statistically significant differences in demographic measures by gender

Demographics at entry to rehabilitation	*Men*	*Women*
% taking part in Phase III	44%	36%
Average age	63	68
Depression % 'borderline' or 'depressed'	16%	24%
Anxiety % 'borderline' or 'anxiety disorder'	29%	42%
% BMI >30	26%	29%
% 5 x 30 min moderate exercise per week	34%	24%
% smoking	22%	20%

Table 9. The outcomes of CR that were statistically significantly different between males and females as recorded in NACR

	% change men	*% change women*
% smoking	- 9.2	- 6.9
% 5 x 30 min exercise per week	+23	+19
% Normal score HADs Anxiety	+6	+7
% Normal score HADs Depression	+3	+7

How many patients who are referred to CR do not take part and why?

What did we find?

Around 27% of patients who were referred and entered into the NACR database did not take part in CR. Around a third were recorded as being 'too ill', 'having further investigations' or 'physically incapacitated'. Of those who were medically suitable the uptake rate was around 83%.

It is worrying that 33% of those patients who could have taken part were 'not interested' in a potentially lifesaving intervention.

Why is this important?

It is clear that when offered CR the great majority of those who are well enough take it up. This confirms the findings of a previous survey by the Healthcare Commission showing that the main reason patients gave for not attending was that CR was not offered to them. The second most common reason was 'patient not interested'. Previous research has shown that if patients are encouraged to attend by their doctor uptake is greatly increased.

The failure to make CR a routine part of the patient's treatment represents a widespread failure on the part of those charged with the well-being of cardiac patients in England, Northern Ireland and Wales.

Method

This data is recorded in the NACR database.

Caveats

The completion rate of this part of the electronic audit is relatively poor, being completed by around 85% of centres. Of necessity, the data shown here only reflects the views of those who were offered rehabilitation.

Table 10. Reasons given for patients not taking part

Reason	*2007-8*
Patient not interested/refused	33%
Physical incapacity	15%
Too ill	5%
Ongoing investigation	6%
Too far to travel	3%
Returned to work	3%
Mental incapacity	2%
Holidaymaker	1%
No transport	1%
Language barrier	<1%
Died	5%
Other	20%

(N=19,369)

How long are patients waiting to start CR?

What did we find?

There are very significant wait times for CR. The median delay between MI and rehabilitation starting is more than three weeks and for angioplasty a month. The wait time for CABG rehabilitation is around eight weeks, probably because in some centres this is part of the treatment protocol.

Encouragingly the wait time has declined significantly over the three years of the audit. The greatest reduction occurred in 2006-7, a year in which the BHF and the BIG Lottery put £4m into CR through a series of grants to programmes to improve access and quality. Across all diagnoses there has been a reduction of more than ten days.

Why is this important?

All modern clinical guidelines agree that rehabilitation should start in hospital or as soon after diagnosis as possible. It is clear that investing a relatively modest amount of money can significantly reduce wait times.

Method

The NACR electronic database asks for the date of the event leading to rehabilitation, the date of referral to rehabilitation and the date the patient started on their rehabilitation programme.

Table 11. Waiting time to referral and start of rehabilitation programme in days for the main diagnostic groups

Year	*2005-6*		*2006-7*		*2007-8*	
	Median time from event to referral (days)	*Median time from event to rehab start (days)*	*Median time from event to referral (days)*	*Median time from event to rehab start (days)*	*Median time from event to referral (days)*	*Median time from event to rehab start (days)*
Myocardial infarction	4	37	3	27	3	25
Bypass surgery	11	55	9	54	9	54
Angioplasty	4	37	3	33	2	30
Other	7	51	5	39	5	35
All	5	43	4	35	4	33

How multi-disciplinary are the programmes?

What did we find?	Almost all programmes had access to nursing skills and 75% to physiotherapy. There appears to have been a significant increase in the degree to which programmes are multi-disciplinary. In particular, there has been an increase in access to dietetics, pharmacy, OT and psychology.
Why is this important?	CR often calls for a diverse range of skills to help patients with medical, psychological and social difficulties. This requires the competencies of several different professions.
Method	This year we asked centres to indicate whether each member of staff was funded for CR or had a service level agreement with another department for their time, was borrowed from another department without any formal arrangements in place, or whether a referral had to be made for a patient to access the profession.
Caveats	Although a professional may be 'part of the team', in reality they may have time only to give a group lecture once every few weeks, rather than deal with patients' individual needs, for example to lose weight or with anxiety and depression.
Further information	Table 33 in Section two shows all of the disciplines mentioned in response to the survey..

Table 12. Percentage of programmes with access to the most commonly reported disciplines

Discipline available % of programmes	*2006-7*	*2007-8*
Nurse	96%	97%
Physiotherapist	71%	75%
Dietitian	55%	66%
Pharmacist	44%	56%
Exercise specialist	28%	45%
Occupational therapist	27%	36%
Psychologist	23%	34%

How many programmes meet the SIGN guideline for staffing per patient?

What are the guidelines	In 2002, the Scottish Intercollegiate Guideline Network set out guidelines for the minimum staffing level per 500 patients attending. In 2008, this was modified and adopted by the British Association of Cardiac Rehabilitation in its National Minimum Standards. This year (2009), the BACR has announced changes to the minimum staffing guideline based on competencies. In the analysis that follows we have used the original SIGN guideline. Next year we will seek to derive audit points derived from the new BACR standards.
What did we find?	Once again there were no programmes in the UK staffed for all professions at the level per patient recommended in the SIGN guideline. Sixty-six per cent of programmes had no psychology input, 32% no dietetics and 37% no clerical support. This lack of support takes clinicians away from patients and imposes a severe strain on the ability to take part in the NACR.
Method	This data is collected as part of the annual survey
Caveats	Seventy nine per cent of programmes responded to this question and it is possible that these were more likely to have been the better funded centres. If the correct band of staff had been taken into account, concordance with the recommendations would have been further reduced.
Further information	Tables 33-39 on pages 47-51 show the staffing and economic data by country.

Table 13. Percentage of programmes across England, Northern Ireland and Wales with staffing levels equivalent to the SIGN guideline with personnel on any pay band

	Meets staffing guideline	*Staffed 50% to 99% of guideline*	*Staffed 1% to 49% of guideline*	*No staff of that profession*	*Hours not reported*
Nursing	73%	14%	7%	3%	2%
Physiotherapy	11%	24%	38%	23%	4%
Pharmacy	1%	2%	42%	44%	11%
Dietetics	8%	1%	44%	32%	14%
Psychology	9%	2%	7%	66%	17%
Clerical (N=253, 79%)	55%	4%	2%	37%	2%

What is the cost per patient?

What did we find?	The median cost per patient in England, Northern Ireland and Wales was £567, an increase from last year's median cost of £461. This is because this year we have included all of the 'phases' of rehabilitation in the costing and there is a drop in the reported number of patients, due to the improved accuracy of the audit. There is a very wide disparity in the cost per patient across the CR programmes in England, Northern Ireland and Wales.
Why is this important?	Patients are entitled to expect the same level of care across the NHS.
Method	We calculated the cost to the NHS of the staff, together with a fixed amount for equipment depreciation. We divided this total cost by the number of patients seen that year to arrive at the 'cost per patient treated'.
Caveats	The response rate for this question was 79%. If, as we suspect, the better funded programmes were more likely to reply the mean cost per patient may be lower than shown here. The 'right' cost of providing CR remains unknown, rurality of the catchment area, the number of 'phases' supplied by one centre and the ideal staff mix have all to be ascertained.

Table 14. Mean and median cost per patient treated in England, Northern Ireland and Wales

Mean (£)	700
Median (£)	567
Interquartile range (£)	342 to 867
% answering the question	79%

What do patients receive in CR programmes?

What did we find?	The common components of CR and the percentage of people recorded as having each of them in 2006-7 and 2007-8 is shown below.
Why is this important?	Comprehensive CR includes attention to medical, psychological and social needs of patients. Patients should be offered a menu of methods for reaching their individually set goals for rehabilitation.
Method	The NACR data collection asks for a record of the activities each patient takes part in during their rehabilitation programme.
Caveats	In the year reported here, electronic data was being contributed by 46% of all CR programmes. In the main it is likely that it is the better resourced programmes that take part, so any bias is likely to be towards presenting better practice than is the norm.

Table 15. What did patients that attended CR receive?

Type	*2006-7**	*2007-8***
Lifestyle Education - written	54%	53%
Group Exercise	58%	60%
Lifestyle Education – talks/video	50%	51%
Relaxation training	42%	44%
Dietary – Group class	41%	43%
Home Exercise	31%	28%
Diet - Individual	24%	21%
Psychological – group talk	30%	32%
Individual Exercise	25%	23%
Home visits	15%	14%
Other	11%	10%
Heart manual	8%	7%
OT group sessions	10%	10%
Road to Recovery	6%	2%
Psychological – individual counsellor	3%	3%
Physiotherapy – individual	3%	3%
Angina plan	2%	2%
Other home based programme	1%	1%
OT individual	1%	1%
Vocational assessment	1%	1%

(*N=15,823,**N=22,723)

How many programmes offer all four phases of CR?

What are the phases?	CR has been described as having four phases, Phase I is prior to discharge, Phase II is the period when the patient is at home and waiting to start the 6-12 week Phase III programme and Phase IV is long term maintenance of health behaviour change, usually in the UK through special facilities provided at leisure centres or gyms in the private sector. Some patients do not receive all of the phases and therefore have an incomplete rehabilitation experience.
What did we find?	The great majority of CR programmes offered Phase III, less than a third of programmes offered a Phase IV programme.
Why is this important?	Some patients only take part in Phase I or Phase II rehabilitation, the National Standards in all three countries state that all patients should take part in Phase III and clinical guidelines in the UK and the United States state that all patients should have each phase.
Method	We asked programmes which phases of CR they provided.
Caveats	There were a few centres who did not answer this question> The addition of non-NHS centres such as leisure centres and council schemes providing Phase IV-only rehabilitation onto our register is new and ongoing and we expect the accuracy of this data to improve over time.

Table 16. CR centres in England, Northern Ireland, Wales, Channel Islands and the Isle of Man operational in 2007-8 and analysed in this report

	Total number of centres	*Provide Phase III*
Combined	338	322
England	295*	279
N. Ireland	16	16
Wales	24	24
Isle of Man and Channel Islands	3	3

*Three centres in England had their CR service suspended during this period and are not included in this report

Table 17. CR centres in the UK in 2009

	Total number of centres	*Provide Phase I*	*Provide Phase II*	*Provide Phase III*	*Provide Phase IV**
UK	382	250	199	361	114

*Mainly based in NHS centres. The addition of non-NHS centres such as leisure centres and council schemes providing Phase IV-only rehabilitation onto our register is new and ongoing.

Are the targets for change set in the English National Service Framework for Coronary Heart Disease being met?

What are the targets?	In England, the National Service Framework for Coronary Heart Disease (2000) set some outcome targets for CR. These recommended that at twelve months at least 50% of people who took part are: • taking regular physical activity of at least 30 minutes duration on average five times a week • not smoking • have a Body Mass Index (BMI) < 30 kg/m^2. Furthermore, 90% should be taking aspirin, 80% statins and 80% beta-blockers or ACE inhibitors.
What did we find	The largest effect was seen in activity levels, with a 19% increase in the number of people exercising five or more times a week (53%) and a 29% reduction in those who never exercised. The number of people who reported smoking also significantly decreased, from 12% to 7%. At 12 months (only a minority of programmes have the capacity to collect 12 month data) there was very little reduction in these gains. Twenty six per cent of people attending CR had a BMI > 30 and there was no change in this percentage at three or twelve months.
Method	The NACR audit records these variables before CR and at 12 weeks and 12 months after CR.
Further information	See tables 40, 41 on page 52.

Do patients have less anxiety and depression and a better quality of life after CR?

What did we find?

All of the domains of the Dartmouth COOP Quality of Life Questionnaire, improved from baseline to three months after starting the programme (the aspects of life the questionnaire assesses are shown in Table 18). Social support was reduced, this was because people became less dependant on the help of others. The biggest gains were in physical fitness, overall health, social activities and daily activities.

Before starting a programme, 28% of patients were borderline or clinically anxious and 17% borderline or clinically depressed. Three months after starting there was very little improvement in levels of anxiety or depression.

Why is this important?

It is one of the most important aims of CR that patients achieve the best quality of life that they can, despite living with a chronic disease. As part of helping people return to a 'normal' life it is important to tackle the distress that is caused by chronic anxiety or depression. Depression is a risk marker for earlier death, and non-compliance with medication and lifestyle advice including smoking and exercise. Research from the United States of America has shown that depressed or anxious cardiac patients accrued four times greater health costs through increased numbers of interventions, admissions and consultations.

Further information

Full results are shown in tables 42-46 on pages 52-54.

Table 18. Dartmouth COOP - Twelve week outcomes % patients with a Normal Score

	Before	*After*	*Change*
Physical fitness	41%	69%	+28
Feelings	84%	87%	+3
Daily activities	85%	94%	+9
Social activities	81%	92%	+11
Social support	89%	87%	-2
Pain	76%	82%	+6
Overall health	67%	78%	+11
Quality of life	95%	97%	+2

Table 19. Hospital Anxiety and Depression Scale (HADS) - Twelve week outcomes

	Before %	*After %*	*Change*
Normal	72	76	+4
Borderline or Clinically anxious	28	24	-4
Normal	83	87	+4
Borderline or clinically depressed	17	13	-4

(N=11,966)

Commentary from each of the four nations of the UK

England

There have been some clear success stories in certain regions (North West and North East) and the overall gains in physical activity and quality of life are impressive and bode well as we try to establish a wider preventative role for CR. The introduction of a National Priority Project for Cardiac Rehabilitation by NHS Improvement, some nine months ago, was a major step in achieving a higher profile for CR and is in part, a consequence of previous NACR findings and the BHF/BACR CR campaign.

However we must improve access and uptake across all conditions and for all demographic categories: in particular the short fall in PCI patients, people with heart failure and those with implanted cardiac devices. Improving access to rehabilitation is something that practitioners, providers and commissioners should work to change over the next 12 months.

The collective work of practitioners, cardiac networks, and the NACR Team is to be commended in positioning CR for the next phase of development. The NACR Team will contribute to aspects of the new work stream around the CR tariff led by NHS Improvement (Heart). We plan to deliver a meaningful tariff that captures the wide range of activity that is required to meet the diverse needs of patients.

We look forward to next year's audit which should start to show the impact of recent CR projects and initiatives.

Professor Patrick Doherty
National Clinical Lead for Cardiac Rehabilitation

Northern Ireland

This year's audit has been well supported in Northern Ireland, with all centres providing information. This will enable an accurate picture to be developed by which to benchmark future improvements.

Unfortunately, as with figures from elsewhere in the UK, this year's audit once again confirms that improvements in access to CR are needed. Low uptake rates are not helped by a failure to meet SIGN guidelines on minimum staffing levels for CR services.

A new service framework for cardiovascular health and well being, published in summer 2009, calls for all patients identified as requiring cardiac rehabilitation to be offered this service. The standard seeks to establish a baseline to determine performance levels. Given recognition of the need for further progress, a new Campaign on Cardiac Rehabilitation, jointly run by Northern Ireland Chest Heart and Stroke and the British Heart Foundation is being set up to take messages direct to decision makers in Northern Ireland.

Bernie Downey
Chairperson, Clinical Advisory Group for Cardiac Rehabilitation and Prevention
Regional Cardiac Services Network for Northern Ireland

Scotland

This year the report covers only England, Northern Ireland and Wales because, following consultation between the Scottish Government, NHS QIS and the Scottish Information Services Division, CR will be one of the first services in Scotland to have an ongoing electronic audit. The BHF / BACR minimum dataset has been incorporated into this so that the results can be fed into future NACR Annual Reports.

The new Heart Disease and Stroke Strategy Action Plan has now been published for Scotland. There is an extensive section on CR, which includes support for the Scottish Cardiac Rehabilitation Campaign and acceptance that 'NHS Scotland will need to increase capacity significantly, particularly in terms of staffing, for CR to be available to all eligible patients…The specific rehab needs of those with heart failure need to be borne in mind.'

The key action point from the new strategy is:

'NHS Boards should, through their cardiac Managed Clinical Networks, undertake a needs assessment of their cardiac rehabilitation process for all eligible patients, identify priorities and allocate appropriate resources, by end March 2010.'

Ben McKendrick
Senior Policy and Public Affairs Manager
British Heart Foundation Scotland

Wales

Recent successes for CR include the Welsh Assembly Government's announcement of £2 million 'ring-fenced' funding within Local Health Board discretionary allocations for the second year running. In addition to this, services in Wales have received an extra £837,579 short-term funding as part of the 'Inequalities in Health Fund' for 2008/09. The recently published Welsh 'National Service Framework for Cardiac Disease', for the first time, has a CR 'Standard'.

Led jointly by Cardiac Networks, Cardiac Rehabilitation Advisory Groups and All Wales Cardiac Rehabilitation Working Group, the 'Baseline Review of Cardiac Rehabilitation' has been instrumental in quantifying inequities, forming the basis for regional 'Strategies' highlighting the much-needed investment for CR within Wales.

As an alliance between BHF Cymru and All Wales Cardiac Rehabilitation Working Group, a 'Campaign Sub Group' meets regularly to review and drive forward progress. Consequently, CR is being kept high on the Welsh Assembly Government's agenda, with regular lobbying of the Health Minister by Assembly Members.

The report of the BHF Cardiac Rehabilitation Patient Focus Groups has provided a clear picture of the impact of inadequate services on patient care and the campaign will lobby to ensure administrative resources are available to programmes to continue NACR participation. This is particularly important given past reliance on charitable funding. Support for the NACR is vital to help establish a true picture of activity in Wales.

Paul Smith
Chairperson, All Wales Cardiac Rehabilitation Working Group

Section 2 Methods and results

Methods

The audit

The audit consists of two elements: the National Database of REHAB, which is an electronic database collecting data using the NHS Information Centre portal (CCAD) and for those programmes that have not yet linked up, an annual postal survey.

Methodology for the NACR data collection

Further information about the audit, how the measures were chosen, the variables collected and their definition, the collection methods and the patient questionnaire pack are available at **www.cardiacrehabilitation.org.uk** .

Methodology for the Annual Survey of CR programmes

In England, Northern Ireland, Wales, the Channel Islands and the Isle of Man a questionnaire was sent to the coordinator of every rehabilitation programme on the Cardiac Rehabilitation Register of Programmes. If programmes did not respond, they were reminded again by letter and then by phone and email.

Notes on the methodology and analysis

Coping with missing survey data

Where centres provided the total number of patients seen but were unable to specify the reason for referral, we estimated the numbers in each of the three main diagnostic categories using the median ratio (diagnosis: total) from centres in that country which did provide the information. Where only a proportion of the referral reasons were provided we applied the same methodology to the missing cases. Where centres did not provide the total number of patients seen but did provide staffing data we estimated the total number of patients using the average number of patients treated for increments of staffing from centres who did provide the information. Diagnostic ratios were then estimated as above.

Where, in a few cases, we had no information about the size of the rehab programme from which the patient population was drawn, we made no attempt to estimate the patient numbers and the outcome tables should be read with this in mind.

Not all centres returned data about the salary band of their health professionals; where this was the case, we estimated by using the median pay band from those centres that had provided data.

Finding out how many patients had an acute event

To work out the percentage of people taking part for each condition, the ‘denominator’, we needed to know the number of people who had that condition in 2007-8. The method of doing this in each of the three countries is presented below. Those people who were recorded as having both an MI and a PCI/CABG in the same year were counted as having an MI.

In England

The Yorkshire and Humber Public Health Observatory supplied Hospital Episode Statistics (The NHS Information Centre for Health and Social Care), which contained individual anonymised

patient level data (with death on discharge recorded) on those who had an MI, PCI and CABG in any diagnostic category.

In Northern Ireland

The Department of Health, Social Services and Public Safety Northern Ireland Statistics provided aggregated data on those discharged alive after having an MI, PCI and CABG in any diagnostic category.

In Wales

Health Solution Wales provided aggregated data on those discharged alive after having an MI, PCI and CABG in any diagnostic category.

Calculating the costs of CR

Three-quarters of programmes surveyed supplied full staffing data and two-thirds provided enough information for us to calculate the cost of treating each patient. Adequately staffed and better funded centres may have been over-represented amongst them. Comparing costs by country is complicated by the differing response rate and the wide range of programmes able to provide the information needed for us to calculate the cost per patient treated; it should be interpreted with caution.

Where it was indicated that the professional was available by referral only and no approximate weekly hours were given, no costs were entered (only a few cases). Where weekly hours for SIGN staff were missing the centre was excluded from the analysis. Staff salary, on-costs, overheads, capital overheads, and travel and training where applicable were taken from Netten and Curtis, Unit Costs of Health and Social Care (2007-8), with appropriate weighting for London and non-London centres. If not otherwise annotated, managers were assumed to be clinical managers and costed using nurse manager multipliers, as were unspecified practitioners. Societal costs were not estimated.

As per *Beswick et al (2004)*, a constant was added to account for equipment of £968 for each rehab centre (£861 multiplied by 3% inflation). Staff costs plus equipment costs were summed and divided by the total number of patients to give the cost per patient. Jersey, Guernsey and the Isle of Man were not included in the cost-per-patient analysis because of non-NHS salaries.

The 2002 SIGN guideline recommended the following staffing levels (and pay bandings) per 500 patients:

Nursing specialists	3.0 WTE Band 6 to 7	Physiotherapy Specialists	2.0 WTE Band 6 to 7
Pharmacy	0.2 WTE Band 6 to 7	Dietetics	0.3 WTE Band 6 to 7
Psychology	0.2 WTE Band 6 to 7	Audit and Clerical	0.5 WTE Band 3

Actual costs of SIGN-recommended staff were calculated using the salary band reported by the programme. The staffing levels shown above assume a predominantly urban population and underestimate the level needed to staff a rural programme.

Comparing the results on uptake by region

Where we have broken down uptake by geographical area it would be a mistake to regard these results as a league table accurate to a few percentage points. This is because, while a CR programme is located within a SHA or Health Board boundary, it may take patients from a second SHA or Health Board or the SHA may 'lose them' to a rehabilitation programme just across that border. For example the SE Wales figure for CABG rehabilitation is more than 100% and this is most likely an example of cross boundary travel, people living in an adjoining area having their rehabilitation in the SE Network area. This is an extreme example and it is likely that the degree of such error is normally reasonably constant across these organisational boundaries especially in the English SHAs where there are usually many programmes per SHA. Therefore, we are certain that the observed postcode lottery does exist in the UK. It is also clear that there are very large differences in performance between SHAs and Health Boards and that some are doing much better than others in terms of patients taking part.

Because of the small number of programme in each Health Board in Northern Ireland, as in previous reports, we have presented the figures for the whole country only and not provided a map.

Finally, although we have the best response rate ever recorded for CR, there is still some degree of underestimate of the numbers having some kind of rehabilitation experience. Firstly because there is still 14% of data that is estimated and secondly because we have not attempted to estimate attendance in 3% of the programmes that are on the CR register but from whom we have been unable to gather any data at all.

Results

Return rate of the Annual Postal Survey

The survey response rate across the UK was excellent at 97%. The table below shows the return rate by country and the number of programmes that were unable to answer the question because they had no way to record numbers.

Table 20. Return rate for the Annual Postal Survey of CR Programmes

	*UK**	*England*	*N Ireland*	*Wales*
Returned survey or provided data – providers of all phases	327/338 (97%)	275/291	17/18	24/24
All Phase III providers only	N=322	N=282	N=16	N=24
Centres included to determine uptake by diagnosis	312 (97%)	272 (96%)	16 (100%)	24 (100%)
Returned survey	298 (93%)	258 (91%)	16 (100%)	24 (100%)
Provided diagnoses of Phase III starters	267 (83%)	233 (83%)	11 (69%)	22 (92%)
Could not provide diagnoses, estimated	30 (9%)	24 (9%)	5 (31%)	2 (8%)
No estimate possible	1 (<1%)	1 (<1%)	-	-
Did not return survey	24 (7%)	24 (9%)	-	-
Some estimation possible	15 (5%)	15 (5%)	-	-
Diagnoses estimated from unverified NACR data	9 (3%)	9 (3%)	-	-
Diagnoses estimated from last year's figures	6 (2%)	6 (2%)	-	-
No estimate possible	9 (3%)	9 (3%)	-	-

*Includes Isle of Man and Channel Islands

Twelve centres providing Phase III rehab volunteered the reason they could not produce any patient numbers. The most common reasons were: no time to compile patient numbers, N=5; problems caused by staff turnover, N=4; waiting to start to use the NACR or other database problems, N=3.

Descriptors and demographics of those referred to CR

Table 21. Average age and gender of patients referred to CR in the three largest patient groups as recorded in the NACR

		*2005-6**		*2006-7***		*2007-8****	
		Average age	*%*	*Average age*	*%*	*Average age*	*%*
Myocardial Infarction	Male	66	67%	66	68%	66	68%
	Female	73	33%	72	32%	73	32%
Bypass surgery	Male	66	80%	66	80%	66	81%
	Female	69	20%	69	20%	69	19%
Angioplasty	Male	63	73%	63	74%	64	74%
	Female	66	27%	68	26%	67	26%
Other	Male	65	63%	65	64%	65	65%
	Female	68	37%	68	36%	68	35%
All	Male	66	69%	65	70%	65	70%
	Female	70	31%	70	30%	71	30%

(N=*15,663, **N=44,307, ***N=71,324)

Table 22. Marital status of patients referred to CR as recorded in NACR

Status	*2005-6** *% of cases*	*2006-7*** *% of cases*	*2007-8**** *% of cases*
Married	74%	73%	72%
Widowed	12%	12%	12%
Single	6%	7%	7%
Permanent partnership	4%	4%	5%
Divorced	4%	4%	4%

(N=*11,308, **N=33,289, ***N=53,630)

Table 23. Ethnicity of patients referred to CR as recorded in NACR

	*2005-6** *% of cases*	*2006-7*** *% of cases*	*2007-8**** *% of cases*
White (British)	84%	76%	74%
White (Irish)	1%	1%	2%
White (Other)	1%	2%	2%
Mixed White/Black Caribbean	<1%	<1%	<1%
Mixed White/Black African	<1%	<1%	<1%
Mixed White/Asian	<1%	<1%	<1%
Mixed Other	<1%	<1%	<1%
Indian	2%	2%	2%
Pakistani	1%	3%	4%
Bangladeshi	<1%	<1%	<1%
Other Asian	<1%	1%	1%
Black Caribbean	<1%	<1%	<1%
Black African	<1%	<1%	<1%
Black Other	<1%	<1%	<1%
Chinese	<1%	<1%	<1%
Other Ethnic Group	<1%	1%	<1%
Not stated	11%	14%	14%

(N=*14,400, **N=40,669, ***N=63,388)

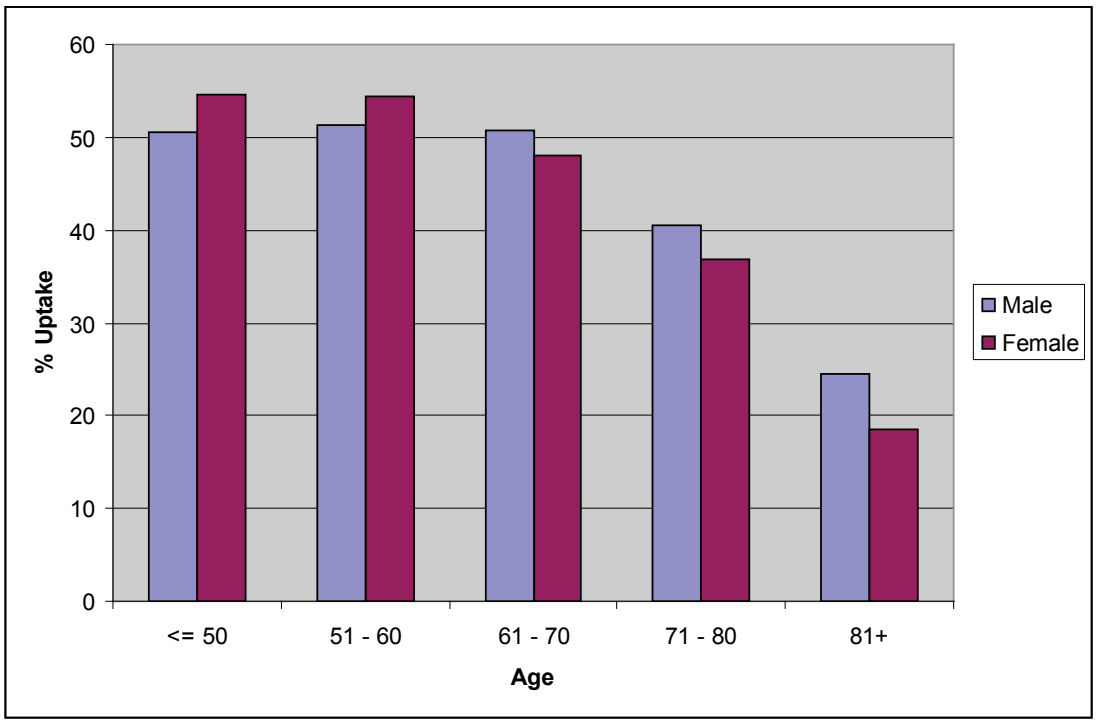
Table 24. Employment status of patients referred to CR as recorded in NACR

	*2005-6** *% of cases*	*2006-7*** *% of cases*	*2007-8**** *% of cases*
Employed - full time	16%	18%	19%
Employed - part time	4%	4%	4%
Self employed - full time	4%	4%	4%
Self employed - part time	1%	2%	1%
Unemployed looking for work	2%	1%	1%
Government training scheme	<1%	<1%	<1%
Looking after family/home	2%	2%	2%
Retired	61%	58%	58%
Permanently sick/disabled	5%	5%	4%
Temporarily sick or injured	6%	7%	6%
Student	<1%	<1%	<1%
Other reasons for not working	1%	1%	1%

(N=*7,208, **N=19,101, ***N=28,652)

Those taking part in Phase III rehabilitation programmes by gender

Figure 1. Phase III uptake by gender and age group



Overall age distribution of men and women referred to CR

	Male (%)	*Female (%)*
<= 50	13.3	6.1
51 - 60	21.4	10.7
61 - 70	25.7	21.0
71 - 80	23.8	28.5
81+	15.8	33.7
Total	100.0	100.0

The medical status of those referred to CR

Table 25. Percentage of patients referred to CR with various co-morbidities as recorded in NACR

	*2005-6**	*2006-7***	*2007-8****
	% of cases	*% of cases*	*% of cases*
Angina	40%	36%	35%
Arthritis	24%	21%	18%
Diabetes	18%	20%	20%
Rheumatism	10%	5%	4%
Stroke	10%	7%	6%
Osteoporosis	8%	4%	3%
Chronic bronchitis	8%	4%	3%
Emphysema	5%	3%	2%
Asthma	14%	12%	11%
Claudication	11%	7%	6%
Chronic back	16%	14%	11%
Hypertension	37%	44%	45%
Cancer	10%	7%	6%
Other complaint	25%	31%	31%

(N=*10,149, **N=35,637, ***N=49,171)

Table 26. Percentage of patients referred to CR with previous cardiac events as recorded in NACR

	*2005-6**	*2006-7***	*2007-8****
	% of cases	*% of cases*	*% of cases*
Myocardial Infarction	19%	19%	18%
Acute Coronary Syndrome	2%	2%	1%
Bypass surgery	5%	5%	5%
Angioplasty	6%	6%	7%
Cardiac arrest	1%	2%	2%
Angina	18%	17%	17%
Other surgery	2%	2%	1%
Heart failure	2%	2%	2%
Pacemaker	1%	1%	1%
ICD	<1%	<1%	<1%
Congenital Heart	<1%	<1%	<1%
Transplant	<1%	<1%	<1%
LV assist device	<1%	<1%	<1%
Other	4%	4%	4%
Unknown	14%	2%	1%

(N=*15,663, **N=44,307, ***N=71,324)

Table 27. Risk profile of patients before starting CR

	*2005-6** *% of cases*	*2006-7*** *% of cases*	*2007-8**** *% of cases*
% BMI > 30	26%	27%	28%
% Systolic BP >140 or Diastolic BP >90	27%	28%	28%
% Smoking	16%	17%	17%
% Less than 5 episodes moderate exercise for 30 mins per week	65%	68%	69%
% Border line query case of depression	9%	12%	12%
% Depressed	6%	7%	7%

(N=*10,937, **N=29,127, ***N=46,097)

Table 28. Activity levels in patients before starting CR

		*2005-6** *% agreeing*	*2006-7*** *% agreeing*	*2007-8**** *% agreeing*
In an average 7 day period how often are you moderately active (ie raise a slight sweat, raised heart beat)	Often	13%	14%	17%
	Sometimes	33%	31%	30%
	Never	54%	55%	53%

(N=*5,372, **N=15,602, ***N=24,087)

Table 29. Activities of daily living in patients before starting CR

During the past week how much difficulty have you had doing your usual activities or tasks, both inside and outside the house, because of your physical and emotional health?	*2005-6** *% agreeing*	*2006-7*** *% agreeing*	*2007-8**** *% agreeing*
No difficulty at all	31%	31%	30%
A little bit of difficulty	28%	26%	28%
Some difficulty	26%	26%	25%
Much difficulty	10%	11%	11%
Could not do	5%	6%	6%

(N=*5,209, N=**14,922, ***N= 21,804)

Table 30. Physical fitness in patients before starting CR

During the past week what was the hardest physical activity you could do for at least two minutes?	*2005-6** *% agreeing*	*2006-7*** *% agreeing*	*2007-8**** *% agreeing*
Very heavy: e.g. run at a fast pace or carry a heavy load upstairs or uphill	5%	5%	5%
Heavy: e.g. jog, slow pace or climb stairs or a hill at moderate pace	14%	14%	14%
Moderate: e.g. walk at medium pace or carry a heavy load on level ground	23%	21%	22%
Light: e.g. walk, medium pace or carry a light load on level ground	30%	31%	30%
Very light: e.g. walk at a slow pace, wash dishes	28%	29%	29%

(N=*5,169, N=**14,742, ***N= 21,540)

Table 31. Reasons for referral to CR by year

	*2005-6** *% of cases*	*2006-7*** *% of cases*	*2007-8**** *% of cases*
MI			
Myocardial Infarction	49%	45%	41%
MI with PCI	1%	4%	6%
MI with recent PCI	1%	2%	2%
Total MI	51%	51%	49%
Acute Coronary Syndrome	4%	6%	5%
Revascularisation			
Angioplasty	12%	13%	15%
Bypass surgery	18%	16%	16%
Other surgery	4%	5%	5%
Transplant	<1%	<1%	<1%
Cardiac arrest	<1%	<1%	<1%
Pacemaker	<1%	<1%	<1%
ICD	<1%	<1%	<1%
LV assist device	<1%	<1%	<1%
Angina	4%	4%	3%
Heart failure	1%	1%	1%
Congenital heart conditions	<1%	<1%	<1%
Other	4%	3%	3%
Unknown	1%	1%	1%
Missing	<1%	<1%	<1%

(N=*15,663, **N=44,307, ***N=71,324)

Uptake

Table 32. Numbers and percentages of patients in the three main diagnostic groups attending

Combined data	*No. of cases*	*Receiving CR*	*% uptake*
MI	83,540	28,514	34%
PCI	32,807	9,830	30%
CABG	18,947	12,888	68%
Total	135,294	51,232	38%
Number of centres able to provide the number seen by diagnostic group			*266/322 (83%)*
Number of centres where we estimated the ratio for the diagnostic group			*46/322 (14%)*
Number of centres whose data could be used in this analysis			*312/322 (97%)*

England	*No. of cases*	*Receiving CR*	*% uptake*
MI	74,120	25,603	35%
PCI	29,974	9,465	32%
CABG	17,381	11,699	67%
Total	121,475	46,767	38%
Number of centres able to provide the number seen by diagnostic group			*233/282 (83%)*
Number of centres where we estimated the ratio for the diagnostic group			*39/282 (14%)*
Number of centres whose data could be used in this analysis			*272/282 (96%)*

Northern Ireland	*No. of cases*	*Receiving CR*	*% uptake*
MI	3,747	1,165	31%
PCI	1,294	225	17%
CABG	520	375	72%
Total	5,561	1,765	32%
Number of centres able to provide the number seen by diagnostic group			*11/16 (69%)*
Number of centres where we estimated the ratio for the diagnostic group			*5/16 (31%)*
Number of centres whose data could be used in this analysis			*16/16 (100%)*

Wales	*No. of cases*	*Receiving CR*	*% uptake*
MI	5,673	1,723	30%
PCI	1,539	140	9%
CABG	1,046	726	69%
Total	8,258	2,589	31%
Number of centres able to provide the number seen by diagnostic group			*22/24 (92%)*
Number of centres where we estimated the ratio for the diagnostic group			*2/24 (8%)*
Number of centres whose data could be used in this analysis			*24/24 (100%)*

Twenty-seven programmes told us they saw fewer patients than normal due to external pressures. Twenty-four of them said the reason was a lack of cover for staff absence or unfilled posts. One reported that service reorganisation had reduced numbers, another had problems with the venue and a third reported a reduced patient flow into their programme.

Of the 25 programmes who volunteered the amount of time the disruption affected patient numbers, five saw fewer patients for up to a month in that year, eight for between a month and three months and 12 had problems that affected programme for more than three months.

England

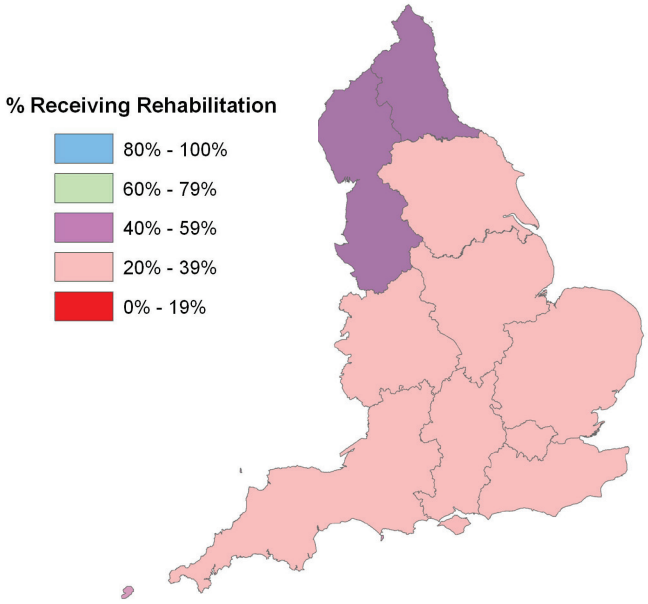


Figure 2. The number and percentage of patients with myocardial infarction (MI) discharged alive and the number and percentage receiving CR by Strategic Health Authority in England

	Centres N	*Provided numbers, N (%)*	*Estimated N (%)*	*Analysed, N (%)*	*Cases*	*Receiving CR*	*Uptake*
North East	21	15 (71%)	5 (24%)	20 (95%)	4,387	2,034	46%
North West	40	37 (93%)	3 (8%)	40 (100%)	11,736	4,675	40%
Yorkshire and the Humber	36	31 (86%)	-	31 (86%)	8,472	2,768	33%
East Midlands	22	21 (95%)	1 (5%)	22 (100%)	7,962	2,470	31%
West Midlands	26	23 (88%)	2 (8%)	25 (96%)	7,250	2,372	33%
East of England	28	27 (96%)	1 (4%)	28 (100%)	7,927	3,025	38%
London	36	30 (83%)	5 (14%)	35 (97%)	7,700	2,360	31%
South East Coast	24	19 (79%)	5 (21%)	24 (100%)	5,985	2,093	35%
South Central	15	13 (87%)	1 (7%)	14 (93%)	5,177	1,229	24%
South West	31	29 (94%)	1 (3%)	30 (97%)	7,524	2,577	34%
TOTAL	279	245 (88%)	24 (9%)	269 (96%)*	74,120	25,603	35%

*Important note, % uptake is likely to be slightly underestimated for some SHAs with missing data

Results are likely to be less accurate with greater amounts of estimated data. Be more confident about the results according to the following key

Key for degree of estimation

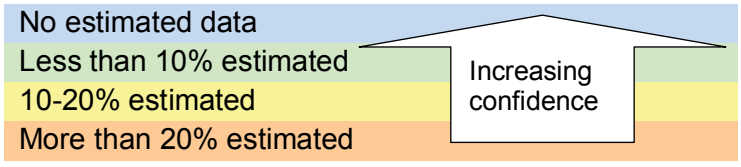
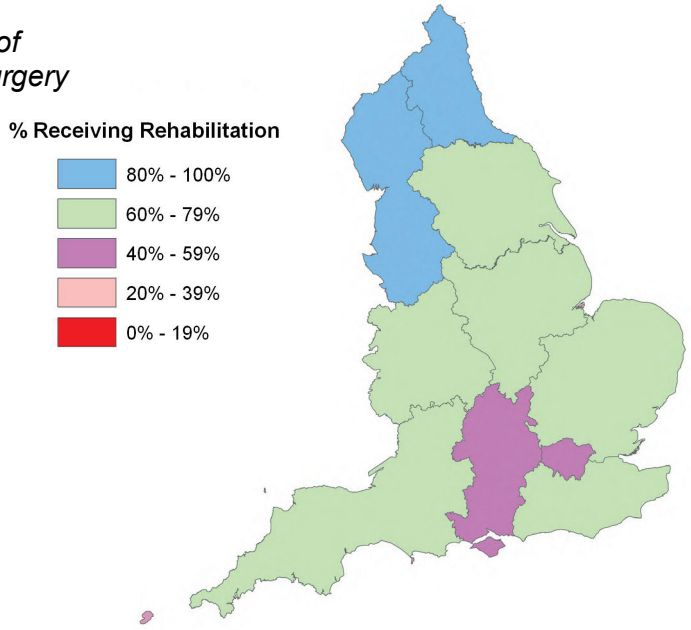


Figure 3. The number and percentage of patients with coronary artery bypass surgery (CAGB) and the number and percentage receiving CR by Strategic Health Authority in England



	Centres N	*Provided numbers, N (%)*	*Estimated, N (%)*	*Analysed, N (%)*	*Cases*	*Receiving CR*	*Uptake*
North East	21	15 (71%)	5 (24%)	20 (95%)	1,052	924	88%
North West	40	37 (93%)	3 (8%)	40 (100%)	2,694	2,400	89%
Yorkshire and the Humber	36	31 (86%)	-	31 (86%)	1,384	897	65%
East Midlands	22	21 (95%)	1 (5%)	22 (100%)	1,310	826	63%
West Midlands	26	23 (88%)	2 (8%)	25 (96%)	1,849	1,136	61%
East of England	28	27 (96%)	1 (4%)	28 (100%)	2,183	1,345	62%
London	36	30 (83%)	5 (14%)	35 (97%)	2,044	1,207	59%
South East Coast	24	19 (79%)	5 (21%)	24 (100%)	1,532	1,034	67%
South Central	15	13 (87%)	1 (7%)	14 (93%)	1,241	674	54%
South West	31	29 (94%)	1 (3%)	30 (97%)	2,092	1,256	60%
TOTAL	279	245 (88%)	24 (9%)	269 (96%)*	17,381	11,699	67%

*Important note, % uptake is likely to be slightly underestimated for some SHAs with missing data

Results are likely to be less accurate with greater amounts of estimated data. Be more confident about the results according to the following key

Key for degree of estimation

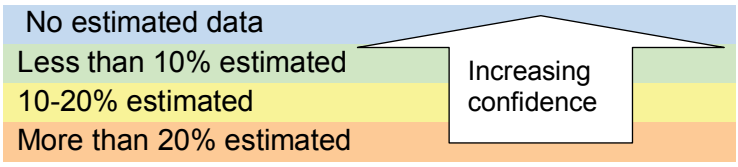
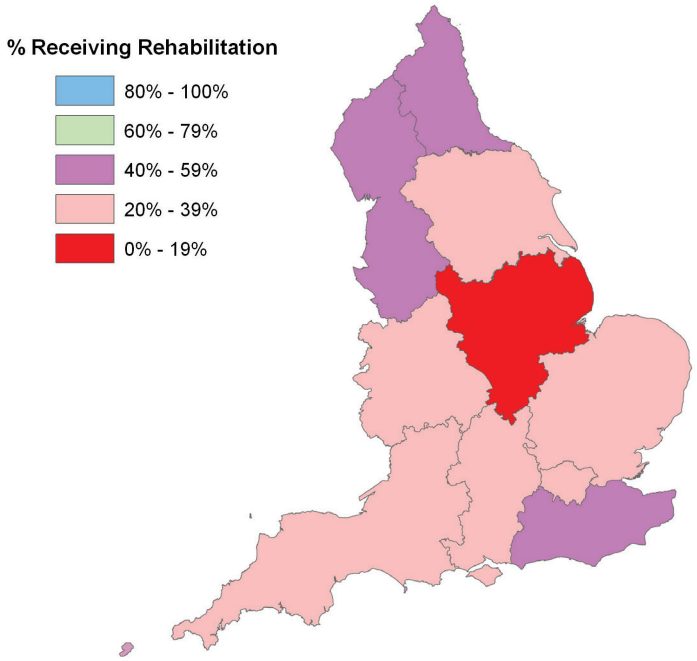


Figure 4 The number and percentage of patients with coronary angioplasty (PCI) eligible for rehabilitation and the number and percentage receiving CR by Strategic Health Authority in England

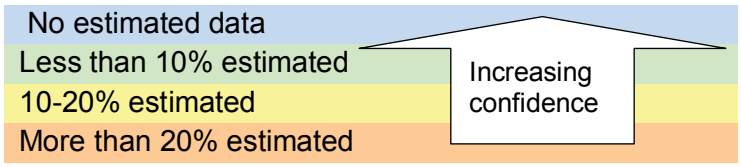


	Centres N	*Provided numbers, N (%)*	*Estimated, N (%)*	*Analysed, N (%)*	*Cases*	*Receiving CR*	*Uptake*
North East	21	15 (71%)	5 (24%)	20 (95%)	1,438	736	51%
North West	40	37 (93%)	3 (8%)	40 (100%)	4,069	2,057	51%
Yorkshire and the Humber	36	31 (86%)	-	31 (86%)	2,965	702	24%
East Midlands	22	21 (95%)	1 (5%)	22 (100%)	2,244	417	19%
West Midlands	26	23 (88%)	2 (8%)	25 (96%)	2,551	791	31%
East of England	28	27 (96%)	1 (4%)	28 (100%)	3,341	787	24%
London	36	30 (83%)	5 (14%)	35 (97%)	4,954	1,382	28%
South East Coast	24	19 (79%)	5 (21%)	24 (100%)	2,640	1,135	43%
South Central	15	13 (87%)	1 (7%)	14 (93%)	2,556	519	20%
South West	31	29 (94%)	1 (3%)	30 (97%)	3,216	939	29%
TOTAL	279	245 (88%)	24 (9%)	269 (96%)*	29,974	9,465	32%

*Important note, % uptake is likely to be slightly underestimated for some SHAs with missing data

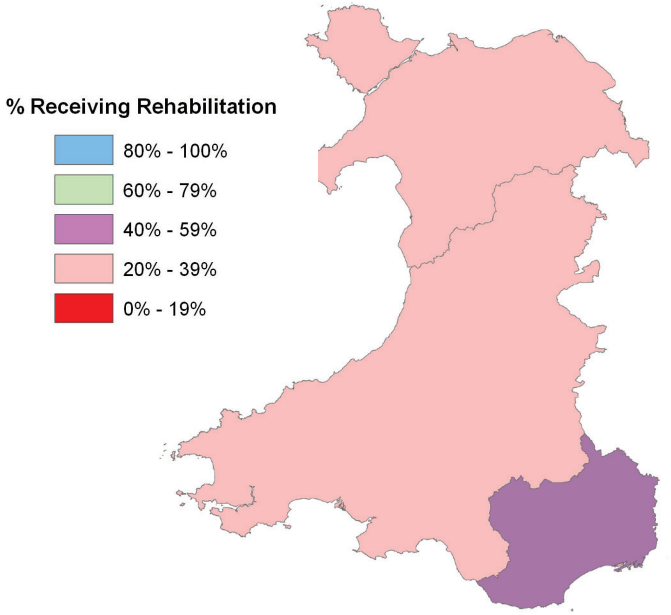
Results are likely to be less accurate with greater amounts of estimated data. Be more confident about the results according to the following key

Key for degree of estimation



Wales

Figure 5. The number and percentage of patients with myocardial infarction (MI) discharged alive and the number and percentage receiving CR by Cardiac Network in Wales



	Centres N	*Provided numbers, N (%)*	*Estimated, N (%)*	*Analysed, N (%)*	*Cases*	*Receiving CR*	*Uptake*
Mid & South West Wales	10	10 (100%)	-	10 (100%)	1,944	537	28%
South East Wales	9	8 (89%)	1 (11%)	9 (100%)	2,032	813	40%
North Wales	5	4 (80%)	1 (20%)	5 (100%)	1,697	373	22%
Total	24	22 (92%)	2 (8%)	24 (100%)	5,673	1,723	30%

Results are likely to be less accurate with greater amounts of estimated data. Be more confident about the results according to the following key

Key for degree of estimation

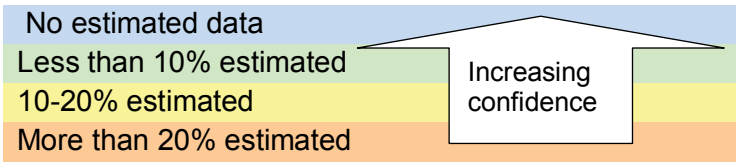
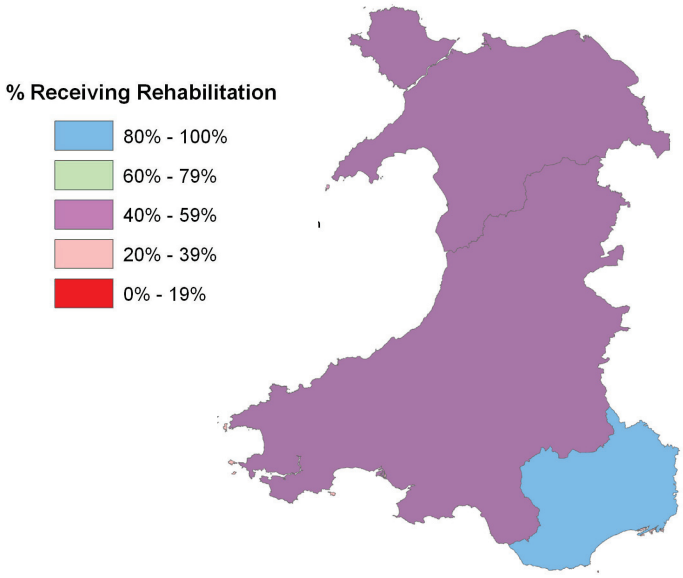


Figure 6. The number and percentage of patients with coronary artery bypass surgery (CABG) and the number and percentage receiving CR by Cardiac Network in Wales



	Centres N	*Provided numbers, N (%)*	*Estimated, N (%)*	*Analysed, N (%)*	*Cases*	*Receiving CR*	*Uptake*
Mid & South West Wales	10	10 (100%)	-	10 (100%)	421	217	52%
South East Wales	9	8 (89%)	1 (11%)	9 (100%)	351	353	101% *
North Wales	5	4 (80%)	1 (20%)	5 (100%)	274	156	57%
Total	24	22 (92%)	2 (8%)	24 (100%)	1,046	726	69%

* this is almost certainly an artefact caused by cross boundary referrals to CR

Results are likely to be less accurate with greater amounts of estimated data. Be more confident about the results according to the following key

Key for degree of estimation

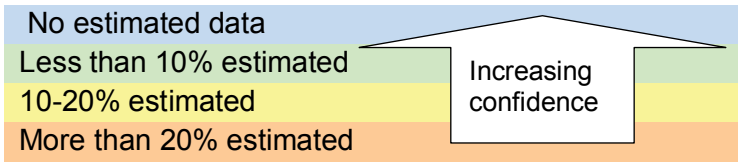
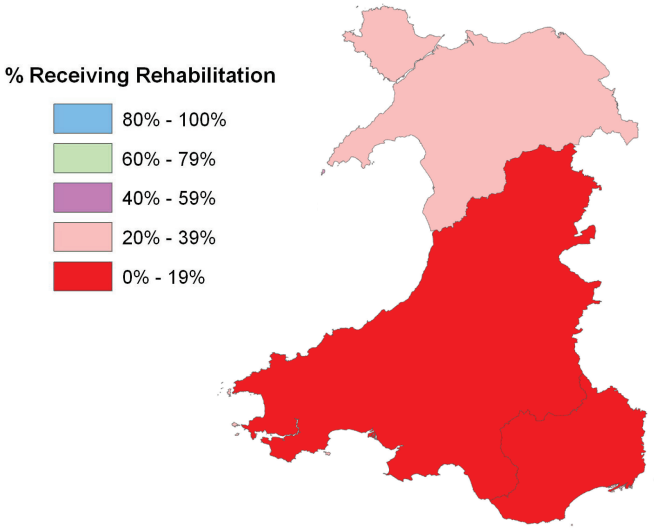


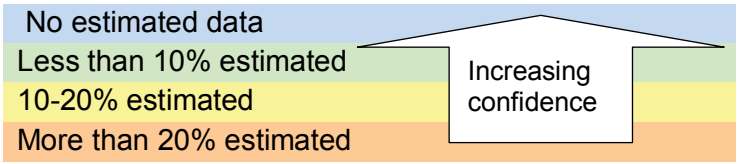
Figure 7. The number and percentage of patients with coronary angioplasty (PCI) and the number and percentage receiving CR by Cardiac Network in Wales



	Centres N	*Provided numbers, N (%)*	*Estimated N (%)*	*Analysed N (%)*	*Cases*	*Receiving CR*	*Uptake*
Mid & South West Wales	10	10 (100%)	-	10 (100%)	484	59	12%
South East Wales	9	8 (89%)	1 (11%)	9 (100%)	677	6	1%
North Wales	5	4 (80%)	1 (20%)	5 (100%)	378	75	20%
Total	24	22 (92%)	2 (8%)	24 (100%)	1539	140	9%

Results are likely to be less accurate with greater amounts of estimated data. Be more confident about the results according to the following key

Key for degree of estimation



Quality issues

Staffing and budgets

See note on interpretation of this information on page 33.

Table 33. The number and percentage of centres providing any phase of CR reporting having access to each professional, by country, N (%) of centres

Profession	*Combined data*	*England*	*Northern Ireland*	*Wales*
Number (%) of centres answering the question	302/338 (89%)	259/295 (88%)	16/16 (100%)	24/24 (100%)
Nurse	293 (97%)	253 (98%)	16 (100%)	24 (100%)
Physiotherapist	228 (75%)	193 (75%)	15 (94%)	20 (83%)
Dietitian	198 (66%)	166 (64%)	14 (88%)	18 (75%)
Clerical	185 (61%)	162 (63%)	6 (38%)	17 (71%)
Pharmacist	168 (56%)	136 (53%)	15 (94%)	17 (71%)
Physical activity / Exercise specialist	137 (45%)	124 (48%)	1 (6%)	12 (50%)
Occupational therapist	110 (36%)	87 (34%)	8 (50%)	15 (63%)
Psychologist	103 (34%)	90 (35%)	6 (38%)	7 (29%)
Doctor	56 (19%)	46 (18%)	4 (25%)	6 (25%)
Healthcare assistant	54 (18%)	46 (18%)	4 (25%)	4 (17%)
Counsellor	43 (14%)	36 (14%)	2 (13%)	5 (21%)
Social worker	43 (14%)	31 (12%)	2 (13%)	10 (42%)
Administrator / Coordinator	19 (6%)	17 (7%)	-	2 (8%)

Table 34. The level of SIGN guideline staffing in centres providing Phase III CR, N (%) of centres

	Combined data	*England**	*Northern Ireland*	*Wales*
Number (%) of Phase III centres answering the question	N=289/322 (90%)	N=249/282 (88%)	N=16/16 (100%)	N=24/24 (100%)
Number of SIGN professions				
0	1 (<1%)	1 (<1%)	-	-
1	19 (7%)	16 (6%)	-	3 (13%)
2	34 (12%)	31 (12%)	1 (6%)	2 (8%)
3	45 (16%)	45 (18%)	-	-
4	65 (22%)	54 (22%)	7 (44%)	4 (17%)
5	89 (31%)	73 (29%)	6 (38%)	10 (42%)
6	36 (12%)	29 (12%)	2 (13%)	5 (21%)
Median number of professionals 2007-8	4	4	4.5	5
Median number of professionals 2006-7**	3.5	3	4	3

(N=289 centres)
*Includes Isle of Man and Channel Islands. Percentages may not total 100 due to rounding
**2006-7 figures included data from Scotland

Table 35. Cost per Phase III patient treated by SIGN recommended staff only (any pay band), by country

	Combined data	*London**	*England (ex. London)***	*Northern Ireland*	*Wales*
Number (%) of Phase III centres answering the question	N=252/319 (79%)	N=27/35 (77%)	189/244 (77%)	N=13/16 (81%)	N=22/24 (92%)
			Cost per Phase III patient		
Mean	£700	£1,010	£621	£732	£1,117
Median	£567	£807	£496	£651	£937
Interquartile range	£342 to £867	£575 to £1,275	£327 to £733	£355 to £1,008	£725 to £1,455

*Salaries costed with London weightings
**Excluding Isle of Man and Channel Islands

Table 36 Number and percentage of Phase III centres with staff levels equivalent to the SIGN guideline (any pay band), N (%) of centres

	Meets staffing guideline	*Meets staffing guideline 2006-7 %**	*Staffed 50 to 99% of guideline*	*Staffed 1 to 49% of guideline %*	*No staff of that profession %*	*Hours not reported %*
Nursing	185 (73%)	60%	36 (14%)	18 (7%)	8 (3%)	6 (2%)
Physiotherapy	27 (11%)	16%	60 (24%)	96 (38%)	59 (23%)	11 (4%)
Pharmacy	3 (1%)	2%	5 (2%)	106 (42%)	111 (44%)	28 (11%)
Dietetics	19 (8%)	8%	3 (1%)	113 (44%)	82 (32%)	36 (14%)
Psychology	22 (9%)	9%	4 (2%)	17 (7%)	167 (66%)	43 (17%)
Clerical	139 (55%)	42%	11 (4%)	4 (2%)	95 (37%)	4 (2%)

(N= 253 centres, 79%)

*2006-7 figures included data from Scotland

Where a centre did not indicate staff types or could not provide the precise number of Phase III patients seen that centre was excluded from the analysis. Centres with access by referral only or who did not report hours are included under 'Hours not reported'. Percentages may not total 100 due to rounding.

Table 37. Number and percentage of Phase III centres in England with staff levels equivalent to the SIGN guideline (any pay band), N (%) of centres

	Meets staffing guideline	*Meets staffing guideline 2006-7*	*Staffed 50% to 99% of guideline*	*Staffed 1% to 49% of guideline*	*No staff of that profession*	*Hours not reported*
Nursing	155 (70%)	57%	35 (16%)	16 (7%)	8 (4%)	6 (3%)
Physiotherapy	19 (9%)	10%	51 (23%)	86 (39%)	54 (25%)	10 (5%)
Pharmacy	2 (1%)	1%	4 (2%)	89 (40%)	103 (47%)	21 (10%)
Dietetics	17 (8%)	8%	3 (1%)	96 (44%)	74 (34%)	30 (14%)
Psychology	19 (9%)	7%	4 (2%)	14 (6%)	144 (65%)	39 (18%)
Clerical	123 (56%)	46%	10 (5%)	3 (1%)	80 (36%)	4 (2%)

(N= 220 centres, includes Isle of Man and Channel Islands, 78%)

Where a centre did not indicate staff types or could not provide the precise number of Phase III patients seen that centre was excluded from the analysis. Centres with access by referral only or who did not report hours are included under 'Hours not reported'. Percentages may not total 100 due to rounding.

Table 38 Number and percentage of Phase III centres in Northern Ireland with staff levels equivalent to the SIGN guideline (any pay band), N (%) of centres

	Meets staffing guideline	*Meets Staffing guideline 2006-7*	*Staffed 50% to 99% of guideline*	*Staffed 1% to 49% of guideline*	*No staff of that profession*	*Hours not reported*
Nursing	12 (86%)	47%	1 (7%)	1 (7%)	-	-
Physiotherapy	1 (7%)	20%	3 (21%)	8 (57%)	1 (7%)	1 (7%)
Pharmacy	-	-	1 (7%)	10 (71%)	1 (7%)	2 (14%)
Dietetics	-	-	-	10 (71%)	2 (14%)	2 (14%)
Psychology	-	7%	-	3 (21%)	10 (71%)	1 (7%)
Clerical	4 (29%)	7%	1 (7%)	1 (7%)	8 (57%)	-

(N= 14 centres, 88%)

Where a centre did not indicate staff types or could not provide the precise number of Phase III patients seen that centre was excluded from the analysis. Centres with access by referral only or who did not report hours are included under 'Hours not reported'. Percentages may not total 100 due to rounding.

Table 39. Number and percentage of Phase III centres in Wales with staff levels equivalent to the SIGN guideline (any pay band), N (%) of centres

Number of SIGN staff on team	*Meets staffing guideline*	*Meets staffing guideline 2006-7*	*Staffed 50% to 99% of guideline*	*Staffed 1% to 49% of guideline*	*No staff of that profession*	*Hours not reported*
Nursing	18 (95%)	86%	-	1 (5%)	-	-
Physiotherapy	7 (37%)	29%	6 (32%)	2 (11%)	4 (21%)	-
Pharmacy	1 (5%)	-	-	7 (37%)	7 (37%)	4 (21%)
Dietetics	2 (11%)	21%	-	7 (37%)	6 (32%)	4 (21%)
Psychology	3 (16%)	14%	-	-	13 (68%)	3 (16%)
Clerical	12 (63%)	50%	-	-	7 (37%)	-

(N=19 centres, 79%)

Outcomes from NACR data

Table 40. Twelve week National Service Framework targets

	2006-7*			2007-8**		
	Before %	*After %*	*Change*	*Before %*	*After %*	*Change*
BMI <30	73	74	+1	74	74	0
Exercise – 5x 30 minutes	36	56	+20	34	53	+19
Exercise						
Often	13	26	+13	14	29	+15
Sometimes	32	46	+14	32	46	+14
Rarely/Never	55	28	-27	54	25	-29
Non smoker	87	92	+5	88	93	+5

(*N=9,502, **N=14,410)

Table 41. Twelve month National Service Framework targets

	2006-7*			2007-8**		
	Before %	*After %*	*Change*	*Before %*	*After %*	*Change*
BMI <30	74	74	0	74	74	0
Exercise 5x 30 minutes	36	49	+13	34	51	+17
Exercise						
Often	13	24	+11	12	24	+12
Sometimes	32	43	+11	31	43	+12
Rarely/Never	55	33	-22	57	33	-24
Non smoker	88	92	+5	88	92	+4

(*N=4,642, **N=4,687)

Table 42. Hospital Anxiety and Depression Scale (HADS) - Twelve week outcomes

	2006-7*			2007-8**		
	Before %	*After %*	*Change*	*Before %*	*After %*	*Change*
HADS Anxiety						
Normal	70	76	+6	72	76	+4
Borderline	17	14	-3	16	15	-1
Clinically anxious	13	10	-3	12	9	-3
HADS Depression						
Normal	83	86	+3	83	87	+4
Borderline	11	9	-2	11	9	-2
Clinically depressed	6	5	-1	6	4	-2

(*N=8,681, **N=11,966)

Table 43. Hospital Anxiety and Depression Scale (HADS) - Twelve month outcomes

	*2006-7**			*2007-8***		
	Before %	*After %*	*Change*	*Before %*	*After %*	*Change*
HADS Anxiety						
Normal	71	75	+4	72	75	+3
Borderline	17	15	-2	16	14	-2
Clinically anxious	12	10	-2	12	11	-1
HADS Depression						
Normal	83	85	+2	82	84	+2
Borderline	11	9	-2	12	10	-2
Clinically depressed	6	6	0	6	6	0

(*N=4,777, **N=3,961)

Table 44. Dartmouth COOP - Twelve week outcomes - % patients with a Normal Score

	*2006-7**			*2007-8***		
	Before %	*After %*	*Change*	*Before %*	*After %*	*Change*
Physical fitness	41	65	+24	41	69	+28
Feelings	83	88	+5	84	87	+3
Daily activities	85	93	+8	85	94	+9
Social activities	81	91	+10	81	92	+11
Social support	87	86	-1	89	87	-2
Pain	75	81	+6	76	82	+6
Overall health	67	76	+9	67	78	+11
Quality of life	94	96	+2	95	97	+2

(N=*7,874, **N=10,966)

Table 45. The outcomes of CR that were significantly different between males and females as recorded in NACR

	% Change men	*% Change women*
% smoking	- 9.2	- 6.9
% 5 x 30 min exercise per week	+23	+19
% Normal score HADs Anxiety	+6	+7
% Normal score HADs Depression	+3	+7

NB. Because there are a very large number of people even small differences are liable to be statistically significant.

Table 46. Dartmouth COOP - Twelve month outcomes - % patients with a Normal Score

	*2006-7**			*2007-8***		
	Before %	*After %*	*Change*	*Before %*	*After %*	*Change*
Physical fitness	39	64	+25	36	64	+28
Feelings	84	86	+2	83	86	+3
Daily activities	83	91	+8	82	91	+9
Social activities	78	90	+12	77	89	+12
Social support	89	84	-5	89	85	-4
Pain	74	78	+4	73	77	+4
Overall health	67	73	+6	64	72	+8
Quality of life	93	96	+3	93	95	+2

(*N=4,495, **N=4,293)

Note on interpretation of this information

Each item in the Dartmouth COOP quality of life scale is scored from 1 to 5, a score of 1-3 is categorised as normal and 4-5 as abnormal.

Table 47. Medication record - Aspirin - Twelve week outcomes

	*2006-7**			*2007-8***		
	Before %	*After %*	*Change*	*Before %*	*After %*	*Change*
No	4	4	0	4	5	+1
Yes	95	94	0	95	94	-1
Contra-indicated	1	1	0	<1	<1	0
Patient declined treatment	<1	<1	0	0	0	0
Not indicated	1	1	0	1	1	0

(*N=10,251, **N=13,277)

Table 48. The percentage of patients giving their maximum level of effort as light, moderate, heavy or very heavy before and after CR: twelve week outcomes

	*2006-7**			*2007-8***		
	Before %	*After %*	*Change*	*Before %*	*After %*	*Change*
Very heavy	5	10	+5	4	9	+5
Heavy	14	27	+13	14	29	+15
Moderate	22	28	+6	23	30	+7
Light	32	23	-9	32	21	-11
Very light	27	12	-15	27	11	-16

(*N=7,874, **N=10,845)

Table 49. The percentage of patients giving their maximum level of effort as light, moderate, heavy or very heavy before and after CR: twelve month outcomes

	*2006-7**			*2007-8***		
	Before %	*After %*	*Change*	*Before %*	*After %*	*Change*
Very heavy	4%	11%	+7	4%	11%	+7
Heavy	13%	25%	+12	13%	25%	+12
Moderate	22%	28%	+6	20%	28%	+8
Light	32%	23%	-9	31%	21%	-10
Very light	29%	13%	-16	32%	15%	-17

(* N=4,495, **N=4,239)

Appendix 1 NACR at York

Prof Bob Lewin (P/T)
Project Lead
Tel: 01904 321327
Email: rjpl1@york.ac.uk

Corinna Petre (P/T)
Project Manager
Day-to-day management of the project, training and quality checks on the data.
Tel: 01904 321336
Email: cbp1@york.ac.uk

Nerina Onion (F/T)
Information and Training Officer
User support, recruitment of new members and training.
Tel: 01904 321326
Email: neo500@york.ac.uk

Stephanie Prady (P/T)
Annual survey officer
Conducted the survey reported here

Georgia Mortzou (P/T)
Administrator
Administration of the project and user feedback.
Tel: 01904 321385
Email: gm539@york.ac.uk

Veronica Morton (P/T)
Statistician
Data analysis and individual programme reports.
Tel: 01904 321365
Email: vm9@york.ac.uk

Appendix 2 Index of tables and figures