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The National Audit of Cardiac Rehabilitation

Quality and Outcomes Report 2020

Strategic mission

The National Audit of Cardiac Rehabilitation (NACR) is a British Heart Foundation (BHF) strategic project supporting cardiovascular prevention and rehabilitation services to achieve the best possible outcomes for people with heart and circulatory diseases irrespective of where they live.

Contents

Executive summary	04
Part one	
Introduction and methods	07
Part two	
CR delivery by nation, Health Region and programme	12
Part three	
Analysis of waiting times and national clinical standards	19
Part four	
Covid-19 analysis	27
Part five	
Recommendations and actions	34
List of tables	37
List of figures	38
List of supplements	39
References	40

Executive summary

This year, cardiac rehabilitation (CR) programmes have had to rapidly adapt to the Covid-19 coronavirus pandemic, supporting the NHS through CR staff redeployment and adjusting service provision to limit the spread of Covid-19 in vulnerable patient groups. During this period, hospital admissions for acute coronary syndrome declined by around 40% compared with the same period in 2019.

Many CR services were either reduced or suspended prior to or during lockdown. During this time, direct patient-level data entry into NACR was still available and some clinical teams continued to input data for patients receiving a modified version of CR. However, due to redeployment, many clinical staff were unavailable to verify uptake figures for their service as part of our established validation requirement. The NACR Steering Group decided to reduce the burden placed on clinical teams at this time by not pursuing clarification of eligible patient numbers and uptake figures. Therefore, this year's report will not include CR uptake figures. Instead, we focus on waiting times, quality of service provision (via the National Certification Programme for CR; NCP_CR) and look at how CR services have adjusted to Covid-19.

Despite the challenges facing CR programmes in adjusting to Covid-19, CR quality continues to improve: 93 programmes have now achieved Green status, an increase of 27 programmes compared with last year. Green status means programmes are meeting all seven key performance indicators (KPIs) required for certification by the NCP_CR. A further 69 programmes are classed as Amber status (meeting 4-6 KPIs) and 51 are classed as Red status (meeting 1-3 KPIs). This improvement in quality is UK-wide, with 38%, 64% and 76% of programmes meeting full certification across England, Northern Ireland and Wales, respectively. Twelve more programmes moved out of the Fail category leaving only ten programmes (5%) in England failing to meet any of the KPIs. There were no programmes in the Fail category in Northern Ireland and Wales.

Executive Summary

Adjustments to services in response to Covid-19 have led to a significant drop in group-based exercise (-36%) and group-based education (-29%) with a corresponding increase (+16%) in CR staff-supported self-managed options. There was a 4% reduction in the number of people treated with surgery and a 1.4% drop in people with heart failure identified by CR teams in the first six months of the Covid-19 period. Fewer people with three or more comorbidities were seen by CR teams during this time. NACR has captured changes in service delivery in response to Covid-19, and this will be used to form a new baseline from which to evaluate CR in the next few years.

These are challenging times for the NHS and CR services as they adjust, or in some cases redesign, their services in light of Covid-19 and protect patients as part of future service provision. The NHS, including rehabilitation services, is unlikely to return fully to previous working practices where large groups of patients with heart disease and comorbidities gather in hospital settings to exercise and receive education. As this report has shown, innovation in service delivery is happening and is highly likely to accelerate in the next 12 months. NACR, the BACPR and BHF working together with clinical teams, will continue to support service change and innovation for the benefit of all eligible patients.

Executive Summary

Key recommendations

- Support CR programmes to continue to use a wider portfolio of CR modes of delivery including digital options to optimise recruitment of patients and increase uptake
- Ensure the quality and effectiveness of CR delivery in relation to the emerging modes of delivery
- Continue to pursue innovation in the remote assessment of patients
- Support CR programmes to adapt service delivery in order to tackle inequalities in accessing CR

Actions

1. Monitor changes in CR mode of delivery reflecting recent changes in NHS practice
2. Monitor the quality and effectiveness of these emerging home and digital modes of delivery
3. NACR to monitor variation in quality and effectiveness in different regions and nations
4. NACR to carry out an analysis of patient outcomes for the 12 months before and after the start of the Covid-19 pandemic

National Audit of Cardiac Rehabilitation (NACR)



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Part one

Introduction and methods



36%

less take up of
group-based CR
during Covid-19

Introduction and methods

Introduction

Cardiac rehabilitation (CR) is an evidence-based intervention delivered to people by a multidisciplinary team (MDT) after a cardiac event. It has been proven to be clinically and cost effective for reducing premature death and improving physical, psychosocial and health-related quality of life outcomes (Salzwedel et al 2020, Shields et al 2018, Rauch et al 2016, Anderson et al 2016, Taylor et al 2014).

Leading British and European associations including the BACPR, Scottish Intercollegiate Guidelines Network (SIGN), National Institute for Care and Excellence (NICE) and European Association of Preventive Cardiology (EAPC) recommend that CR should be offered to all eligible patients in a timely and appropriate manner (BACPR 2017, NICE 2010, 2013, 2018, SIGN 2017, Piepoli et al 2012). Clinical trials have shown that CR is effective when delivered in the form of a structured, supervised or facilitated group- or home-based intervention over two or more months (BACPR 2017, Piepoli et al 2012). Several clinical reviews, trials and editorials (Dalal et al 2015, West et al 2011, Anderson et al 2016, Wood 2012, Doherty & Lewin 2012) have agreed that CR is highly effective but warn that not all programmes achieve the minimum standards set by the BACPR.

NACR is a clinical registry embedded within routine CR practice through NHS Digital. Registration and submission of data into NACR is one of the standards of the BACPR (BACPR 2017). The BHF and NACR, working in collaboration with the BACPR, local health authorities and providers in England, Northern Ireland, Scotland and Wales, are committed to quality improvement so that all patients receive the highest standard of CR and gain the expected benefits no matter where they live.

Historically, UK CR has predominately been delivered using group-based approaches in a hospital setting. Today, many programmes offer home-based or community CR options and there has been a shift in recent years towards these. CR referral is typically through established clinical pathways including after Myocardial Infarction (MI), Percutaneous Coronary Intervention (PCI), Coronary Artery Bypass Graft (CABG), Valve Surgery or following a diagnosis of Heart Failure (HF). In England, hospital admissions for acute coronary syndrome declined by 40% compared with the same period in 2019 due to Covid-19: weekly admissions reduced from a mean of 3017 per week (based on the 2019 average) to 1813 per week (Mafham et al 2020).

Innovation in CR delivery is now happening faster than ever due to Covid-19. The need to avoid groups of people gathering to exercise or receive education has led to a marked increase in web- and app-based approaches to CR delivery. It is fortuitous that NACR and NHS Digital recently developed and implemented a new 'mode of rehabilitation delivery' data field in the registry, with 11 different delivery mode options. This is enabling local hospital- and community-based clinical teams to input data on their emerging

Part one: Introduction and methods

new methods of CR introduced in response to Covid-19. By focusing on the quality of CR delivered through these various approaches, this year's report will set a new baseline for monitoring the effectiveness of different modes of CR delivery.

This year, we will report patient outcomes for 2019 as online supplements. Next year, we will carry out a new assessment of patient outcomes associated with the different CR modes of delivery driven by the changes in NHS practice caused by Covid-19. NACR will continue to produce monthly downloads to enable local teams to request the running of regular and timely reports, and the NACR database will continue to provide access to up-to-date data reports directly to CR programmes so that teams can generate their own local reports about service change and quality. Through this process, NACR – working with the BHF and BACPR – will monitor CR quality and outcomes to support the continued improvement of CR services across the UK at this unprecedented time for the NHS.

For more information visit:

<http://www.cardiacrehabilitation.org.uk>

<https://www.bacpr.com>

Part one: Introduction and methods

Methods for collecting data for NACR Quality and Outcomes Report 2020

NACR uses a quality approach with extensive data checking and validating, which has reduced the burden of matching and cleaning audit data. Through our work with NHS Digital and representatives from Health Regions in England, Northern Ireland and Wales we have aligned data collection with KPIs such as timing and duration of CR, and across regional health boundaries. We continue to move forward with the inclusion of Scotland in NACR which will allow us not only to capture the good work that is happening, but also help evaluate their new integrated approach to CR.

BACPR Standards and NCP_CR KPIs both require CR programmes to register with, and enter data through, NACR as an essential part of quality assurance in CR delivery and to drive service improvement (BACPR 2017, Furze et al 2016).

The 2020 annual report periods were not affected in respect of data entry but we were unable to collect sufficient staffing details and to verify CR patient uptake numbers from clinical teams. Therefore the report features on service and patient-level data without an uptake analysis.

Parts 1 to 3 of the report are based on data from January to December 2019. Part 4 (Covid-19 analysis) is based on data from August 2019 to January 2020 compared with February to July 2020.

Part one: Introduction and methods

Approval process for accessing NHS data for NACR

NACR, through NHS Digital, has approval (under Section 251 of the NHS Act 2006) from the Health Research Authority's Confidentiality Advisory Group (CAG) to collect patient identifiable data in England and Wales without explicit consent from individual patients. NACR is GDPR compliant and has a Privacy Notice available on the website (www.cardiacrehabilitation.org.uk/patient-privacy-notice.htm). In partnership with NHS Digital we adhere to the National Data Opt Out policy.

NACR and NHS Digital have Data Access Agreements (DAAs) with the five Health and Social Care Trusts in Northern Ireland. Information Sharing Agreements (ISAs) are in place for the Health Boards in Scotland that will be involved in the NACR pilot.

Gaining the consent of patients to use their data for national audit purposes is extremely difficult during the management of a heart attack or immediately following surgery. For this reason, the NHS has in place an 'exemption from consent' process where clinical and personal data are entered into NHS systems without explicit consent. Patients are informed about the purposes of the audit and how the information will be used through face-to-face communication, and through the assessment questionnaires that are used to collect data for the audit. There is information at the start of these questionnaires to provide patients with details of why the data is being collected, how it is used, who can see it, and their right to opt-out without any effect on their treatment. Section 251 approval and the data agreements cover the roles of the BHF, NHS Digital and NACR and ensures the highest quality procedures for collecting, sharing and using only the agreed data about a patient's CR experience. NACR's approval and the purpose of the national audit are reviewed each year by CAG and DAAs/ISAs are reviewed regularly.

For more information about NACR please visit our web pages.

The Cardiovascular Health Research Group

www.york.ac.uk/healthsciences/research/cardiac

www.cardiacrehabilitation.org.uk

Part two

CR delivery by nation, Health Region and programme



16%

increase in supported
home-based CR

Part two: CR delivery by nation, Health Region and programme

NACR statistics by nation, Health Region and local programme level

Table 1 reports on the distribution of programmes across the 24 Health Regions for England, Northern Ireland and Wales.

CR programme data by nation and Health Region

This year, 83% of programmes were registered for electronic data entry into NACR (an increase of 1% from 2019) enabling greater audit coverage and reporting of national trends. Fifteen of the 24 Health Regions achieved 100% registration of their programmes to NACR (Table 1).

Part two: CR delivery by nation, Health Region and programme

Table 1: CR programme data by nation and Health Region

Nation	Health Region	Total Programmes	Electronic NACR Registration	% Registered
England*	Cheshire and Merseyside (C&M)	11	11	100
	East Midlands (EM)	15	11	73
	East of England (EoE)	22	19	86
	Greater Manchester, Lancashire and South Cumbria (GM, L&SC)	20	16	80
	London (L)	34	27	79
	Northern England (NE)**	14	6	43
	South East Coast (SEC)	16	15	94
	South West (SW)	16	16	100
	Thames Valley (TV)	4	4	100
	Wessex (W)	8	8	100
	West Midlands (WM)	20	17	85
	Yorkshire and The Humber (Y&TH)	23	16	70
Northern Ireland	Belfast Health and Social Care Trust (BHSCT)	1	1	100
	Northern Health and Social Care Trust (NHSCT)	1	1	100
	South Eastern Health and Social Care Trust (SEHSCT)	3	3	100
	Southern Health and Social Care Trust (SHSCT)	3	3	100
	Western Health and Social Care Trust (WHSCT)	3	3	100
Wales	Aneurin Bevan University Health Board (ABUHB)	4	4	100
	Betsi Cadwaladr University Health Board (BCUHB)	3	3	100
	Cardiff and Vale University Health Board (CVUHB)	1	1	100
	Cwm Taf Morgannwg University Health Board (CTMUHB)	2	2	100
	Hywel Dda University Health Board (HDUHB)	3	3	100
	Powys Teaching Health Board (PTHB)**	2	1	50
	Swansea Bay University Health Board (SBUHB)	2	2	100
Other	-	3	1	33
Total		233	194	83

*Nine programmes in England have been omitted as they provided Early CR data and from this point this audit only refers to Core Delivery.

Four of these programmes are registered with, and enter data through, NACR. See Early Rehabilitation Supplement online for more information. www.cardiacrehabilitation.org.uk/current-annual-report.htm

**NE (Northern England) and PTHB (Powys Teaching Health Board) have been removed from subsequent tables due to insufficient NACR data.

Part two: CR delivery by nation, Health Region and programme

A total of 223 programmes submitted data to NACR and were subsequently included in the NCP_CR as shown below (Table 2).

Table 2: Total number of programmes, programmes included in NCP_CR, programmes registered via NACR by nation

Number of programmes	
Total number of programmes	233
Total number of core programmes*	225
Number of programmes included in NCP_CR Certification Report**	
England***	195
Northern Ireland	11
Wales	17
Total	223
Number of programmes registered via NACR	
England***	167
Northern Ireland	11
Wales	16
Total	194

*Eight of the total programmes were early CR.

**Two programmes (Jersey and Guernsey) were removed due to data entry issues beyond their control.

***England includes Isle of Man.

Part two: CR delivery by nation, Health Region and programme

Age and gender profile at nation and programme level

Overall, the proportion of patients attending CR in the UK who are female has remained the same at 29%. However, there is considerable variation in attendance by female gender between programmes in each nation, ranging from 15% to 36% in England, with less variability in Northern Ireland and Wales (Figures 1a-c). There are some positive exceptions where local programmes have much better recruitment of women compared with national averages. Although the infrastructure and funding model may vary between neighbouring services there is opportunity to learn from comparable programmes who are successfully recruiting more females to CR. We can help to link programmes with each other to discuss best practices on request.

The UK is leading the way in recruiting a diverse age range of people to participate in CR programmes, with a mean age of 67 years (range from 18 to 105). This is highly representative of the diverse range of people with coronary heart disease (CHD). More than 35% of people registered with NACR are over 75 years of age, which is markedly different to randomised controlled trials of CR in CHD which include virtually no patients older than 71 years and a population with an average age of 56 years (Anderson et al 2016). NICE guidance (NICE 2013) recommends that all patients regardless of their age should be offered CR. This data shows that UK programmes are successfully implementing these recommendations through an inclusive approach across the full patient demographic.

Part two: CR delivery by nation, Health Region and programme

Figure 1a/b/c: Proportion of male and female participants by age and nation/programme

Fig. 1a England

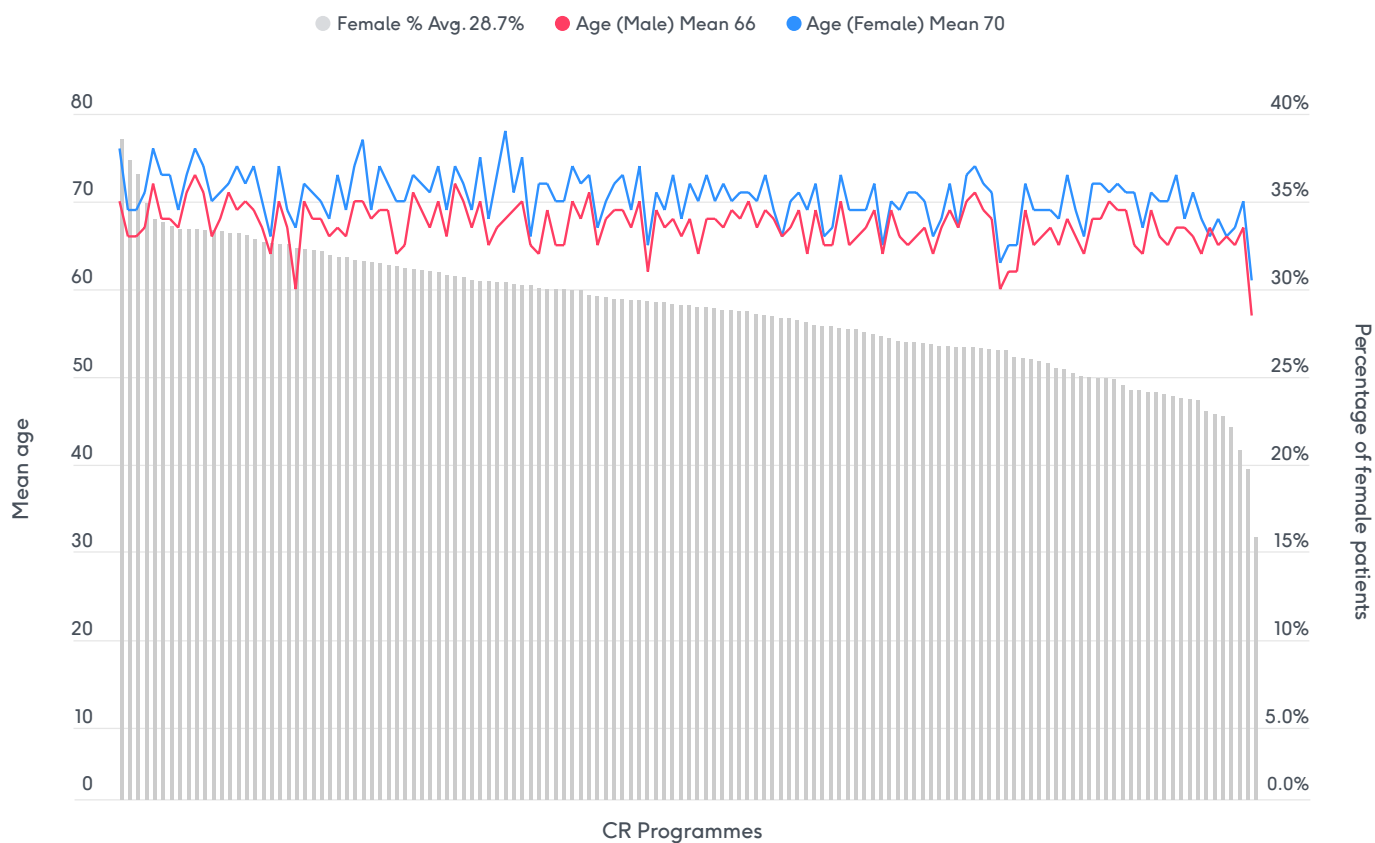


Fig. 1b Northern Ireland

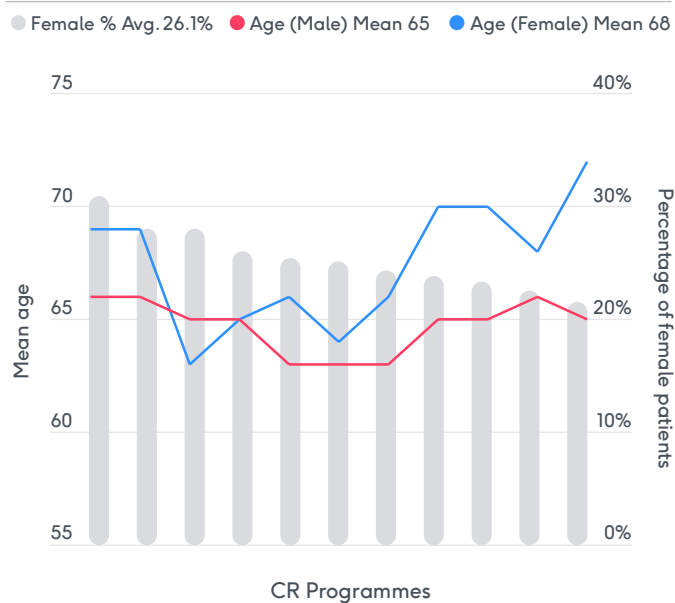
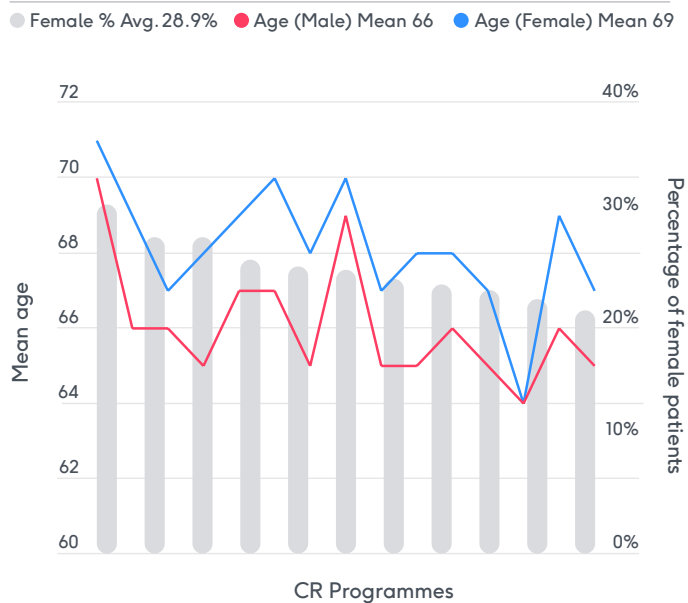


Fig. 1c Wales



Part two: CR delivery by nation, Health Region and programme

Ethnicity and gender by comorbidity

The majority of patients attending CR remains predominately White-British (79%) and male (71%) with Indian and Pakistani groups each representing 3% of the annual intake of CR patients (Table 3). The extent of comorbidity (Table 3 final column) is generally high with on average 77% of patients presenting with two or more comorbidities. This trend is more pronounced in the Irish, Bangladeshi, White and Black Caribbean, Other Asian, Black Caribbean and Indian populations. The NACR supplement showing further detail of local level variation in CR by ethnicity can be referenced at

www.cardiacrehabilitation.org.uk/current-annual-report.htm

Table 3: CR population by ethnic group, gender and comorbidities

Ethnicity		UK total	Total %	Male %	Female %	% w/two or more comorbidities
White	British	73544	79.0	71.0	29.0	68.8
	Irish	1502	2.0	72.0	28.0	79.6
	Any other White background	2905	3.0	73.0	27.0	67.2
Mixed/Multiple ethnic groups	White and Black Caribbean	136	<1.0	62.0	38.0	76.7
	White and Black African	71	<1.0	73.0	27.0	69.4
	White and Asian	124	<1.0	85.0	15.0	68.3
	Any other mixed background	254	<1.0	72.0	28.0	50.2
Asian/Asian British	Chinese	138	<1.0	70.0	30.0	59.3
	Indian	2408	3.0	74.0	26.0	75.6
	Pakistani	2328	3.0	76.0	24.0	64.4
	Bangladeshi	723	1.0	80.0	20.0	70.5
	Any other Asian background	1323	1.0	79.0	21.0	73.0
Black/African/Caribbean/Black British	Caribbean	567	1.0	61.0	39.0	72.9
	African	423	<1.0	74.0	26.0	66.5
	Any other Black background	197	<1.0	68.0	32.0	58.1
Other	Any other ethnic group	978	1.0	77.0	23.0	64.9
	Not stated	5298	6.0	73.0	27.0	59.3
Total		92919	100	71.0	29.0	77.0

Due to rounding of data, figures within this table may not add up to 100%

Part three

Analysis of waiting times and national clinical standards



27

more programmes
achieved full
certification this year

Part three: Analysis of waiting times and national clinical standards

Is CR delivered early enough to meet national guidance?

We know that the longer patients wait to start CR the less they benefit compared with those who have timely CR (Fell et al 2016, Sumner et al 2017). The BACPR, NICE, SIGN and the NCP_CR (Furze et al 2016) all recommend that CR is started early.

In 2014, NACR reported average wait times of 54 days for cardiac patients treated with surgery and 40 days for non-surgical patients. At that time, no Health Regions met the national wait time targets of 42 and 28 days for surgical and non-surgical patients, respectively. In 2020, UK median CR wait times have reduced to 33 and 21 days for surgical and non-surgical patients, respectively. This represents a reduction in waiting time of 21 days for surgical patients and of 19 days for non-surgical patients compared with 2014 surpassing national targets and yielding significant improvements in service delivery and patient benefit by avoiding delay (Hinde et al 2020). This change in clinical practice owes much to sustained BHF-funded studies at the University of York on wait times. Before these studies, average wait times had only decreased by 2.5 days between 2011 and 2014.

There are also service benefits to offering timely CR: the sooner patients engage with the CR process, the more likely they are to start, resulting in increased uptake. Health economics modelling of timely CR has quantified a 15.3% benefit in CR uptake (~20,786 more patients based on 2019 national audit data) alongside an associated increase in long-term patient health that equates to cost per Quality of Life Years (QALY) of £3,286 (Hinde et al 2020).

Overall, there is a positive national trend for CR waiting times compared with last year with all nations delivering waiting times below the minimum standards. Wait times in Northern Ireland and Wales are similar and lower than those in England. However, significant variation exists at programme level (Table 4 and Figures 2a-c).

The NACR Supplement provides further detail of local level variation in waiting time of CR.

www.cardiacrehabilitation.org.uk/current-annual-report.htm

Part three: Analysis of waiting times and national clinical standards

Table 4: Time (days) from post-discharge referral to start of core CR

Nation	Health Region	MI/PCI days	CABG days
England	Cheshire and Merseyside (C&M)	20	27
	East Midlands (EM)	29	63
	East of England (EoE)	18	35
	Greater Manchester, Lancashire and South Cumbria (GM, L&SC)	23	37
	London (L)	28	34
	South East Coast (SEC)	20	29
	South West (SW)	33	42
	Thames Valley (TV)	29	35
	Wessex (W)	22	35
	West Midlands (WM)	26	35
	Yorkshire and The Humber (Y&TH)	9	19
	Total	22	34
Northern Ireland	Belfast Health and Social Care Trust (BHSCT)	21	38
	Northern Health and Social Care Trust (NHSCT)	11	12
	South Eastern Health and Social Care Trust (SEHSCT)	20	27
	Southern Health and Social Care Trust (SHSCT)	27	49
	Western Health and Social Care Trust (WHSCT)	22	40
	Total	16	25
Wales	Aneurin Bevan University Health Board (ABUHB)	31	43
	Betsi Cadwaladr University Health Board (BCUHB)	9	10
	Cardiff & Vale University Health Board (CVUHB)	21	26
	Cwm Taf Morgannwg University Health Board (CTMUHB)	10	23
	Hywel Dda University Health Board (HDUHB)	17	28
	Swansea Bay University Health Board (SBUHB)	21	29
	Total	16	22
Total		21	33

N = 52437

Part three: Analysis of waiting times and national clinical standards

Figure 2a/ b/c: Time from referral to start of CR by programme and nation

Fig. 2a England



Fig. 2b Northern Ireland

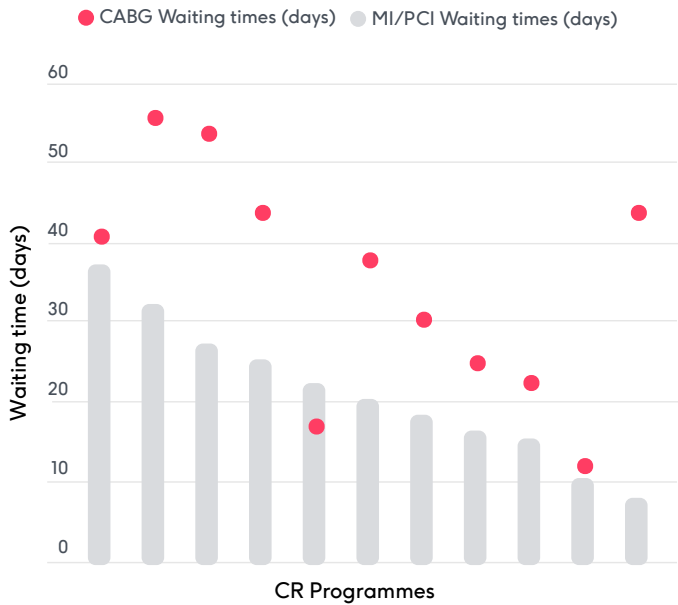
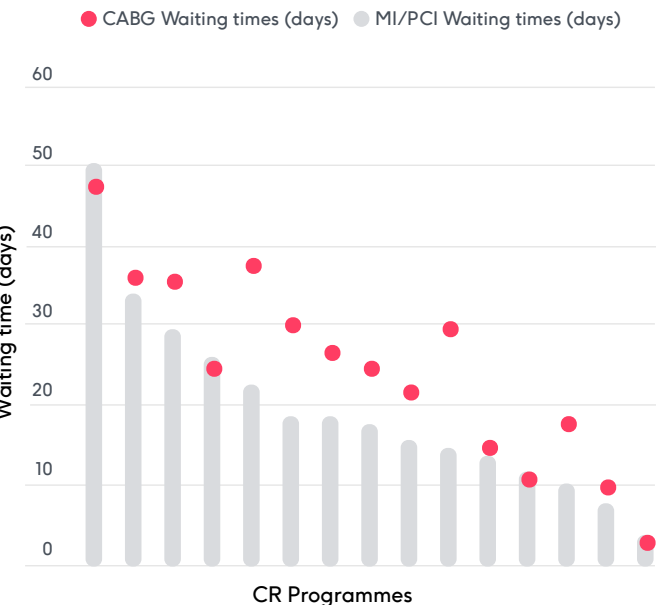


Fig. 2c Wales



Part three: Analysis of waiting times and national clinical standards

Monitoring national standards for CR

For the fourth year running the NCP_CR programme has reviewed the quality of CR service delivery in England, Northern Ireland and Wales against the KPIs set out by the BACPR and NACR (Table 5). This year's review takes into account clinical data input issues from December 2019 to May 2020 and the impact of Covid-19 on CR services, where NHS redeployment affected service provision or delayed data entry. The NCP_CR Steering Group agreed to carry over NCP_CR status achieved in 2019 for programmes that would otherwise have been downgraded (e.g. from Green to Amber).

This year's NCP_CR analysis shows that 93 programmes have now achieved Green status, an increase of 27 programmes compared with last year. Green status means programmes are meeting all seven key KPIs required for certification by the NCP_CR (Table 6). A further 69 programmes are classed as Amber status (meeting 4–6 KPIs) and 51 are classed as Red status (meeting 1–3 KPIs). The improvement in quality is UK-wide, with 38%, 64% and 76% of programmes meeting full certification across England, Northern Ireland and Wales, respectively. Twelve more programmes moved out of the Fail category. This leaves only 10 programmes (5%) in England failing to meet any of the KPIs and no programmes in the Fail category in Northern Ireland and Wales.

An analysis of CR quality from 2014 to 2020 shows a significant improvement: with 27 programmes in 2014 meeting six KPIs to 93 programmes in 2020 meeting the updated and more challenging standards based on seven KPIs including delivery of CR by a MDT (Table 7).

The NACR Certification Supplement provides further detail of all programmes included in the NCP_CR and can be found at:

<http://www.cardiacrehabilitation.org.uk/current-annual-report.htm>

Part three: Analysis of waiting times and national clinical standards

Table 5: NCP_CR key performance indicators (KPIs)

NCP_CR KPIs

Minimum standard 1: MDT	At least three health professions in the CR team who formally and regularly support the CR programme
Minimum standard 2: Patient group	Cardiovascular rehabilitation is offered to all these priority groups: MI, MI+PCI, PCI, CABG, HF
Minimum standard 3: Duration	Duration of Core CR programme: $\geq$ national median of 56 days (8 weeks)
Standard 4: National average for assessment 1	Percentage of patients with recorded assessment 1: England $\geq 80\%$; Northern Ireland $\geq 88\%$; Wales $\geq 68\%$
Standard 5: National average for CABG wait time	Time from post-discharge referral to start of Core CR programme for CABG national median of: England ≥ 46 days; Northern Ireland ≥ 52 days; Wales ≥ 42 days
Standard 6: National average for MI/PCI wait time	Time from post-discharge referral to start of Core CR programme for MI/PCI national median of: England ≤ 33 days; Northern Ireland ≤ 40 days; Wales ≤ 26 days
Standard 7: National average for assessment 2	Percentage of patients with recorded assessment 2 (end of CR): England $\geq 57\%$; Northern Ireland $\geq 61\%$; Wales $\geq 43\%$

Information on staffing profile and MDT, which forms one of the NCP_CR KPIs, is taken from the NACR annual email survey. This information is not collected on the electronic NACR database. In order for certification to be validated each CR team must return the NACR annual email survey form with staffing completed.

Part three: Analysis of waiting times and national clinical standards

Table 6: NCP_CR classification scale

NCP_CR Status	KPIs
 Green (certified)	Meeting all seven KPIs
 Amber	Meeting four to six KPIs
 Red	Meeting one to three KPIs
 Fail	Meeting no KPIs

Table 7: NCP_CR certification status for all CR programmes 2020

	England N=195	N. Ireland N=11	Wales N=17	UK N=223
 Green (certified)	73 (38%)	7 (64%)	13 (76%)	93 (42%)
 Amber	63 (32%)	4 (36%)	2 (12%)	69 (31%)
 Red	49 (25%)	0	2 (12%)	51 (23%)
 Fail	10 (5%)	0	0	10 (4%)

Due to rounding of data, figures within this table may not add up to 100%

Due to Covid-19 and clinical data input issues from Dec 2019 to May 2020 the NCP_CR Steering Group agreed to hold NCP_CR status achieved in 2019 for programmes where NHS redeployment has impacted service provision or delayed data entry. Ten Green, five Amber and 11 Red programmes retain their NCP_CR status for 2020.

Part three: Analysis of waiting times and national clinical standards

Figure 3a/b/c: NCP_CR status by Health Regions across England, Northern Ireland and Wales

Fig. 3a England

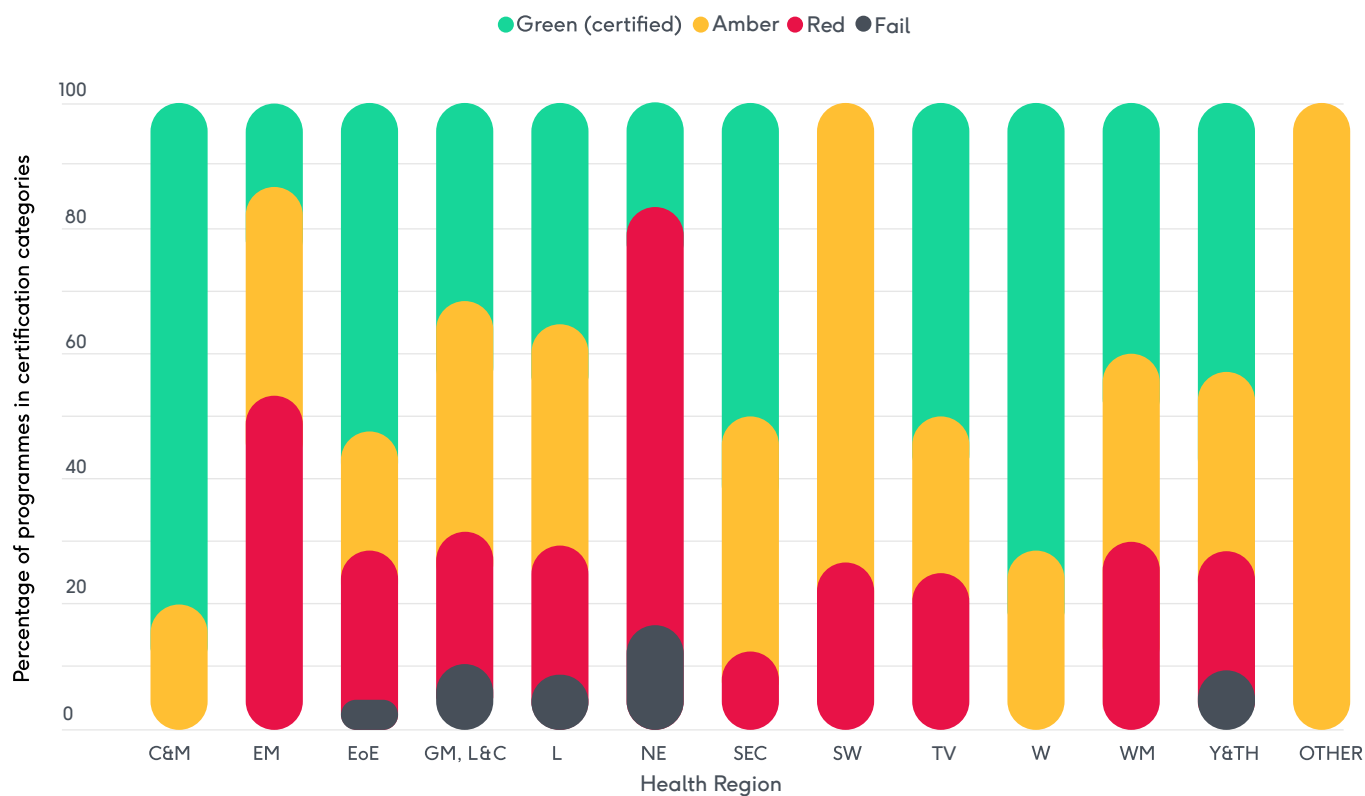


Fig. 3b Northern Ireland

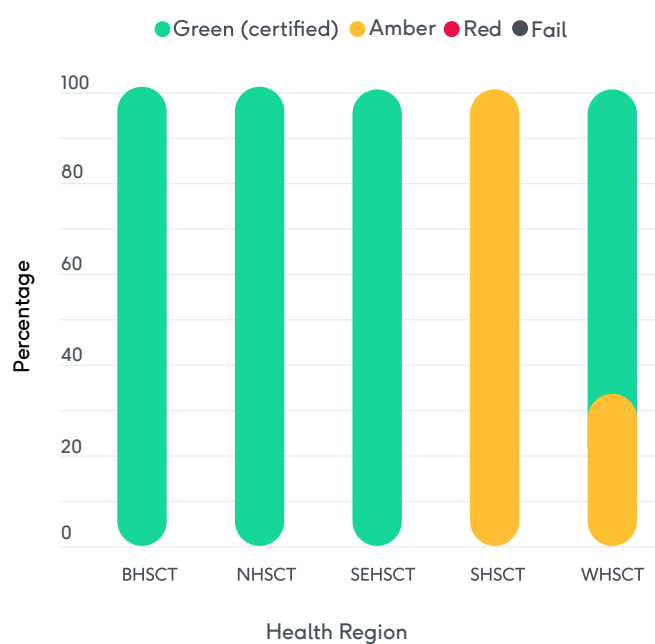
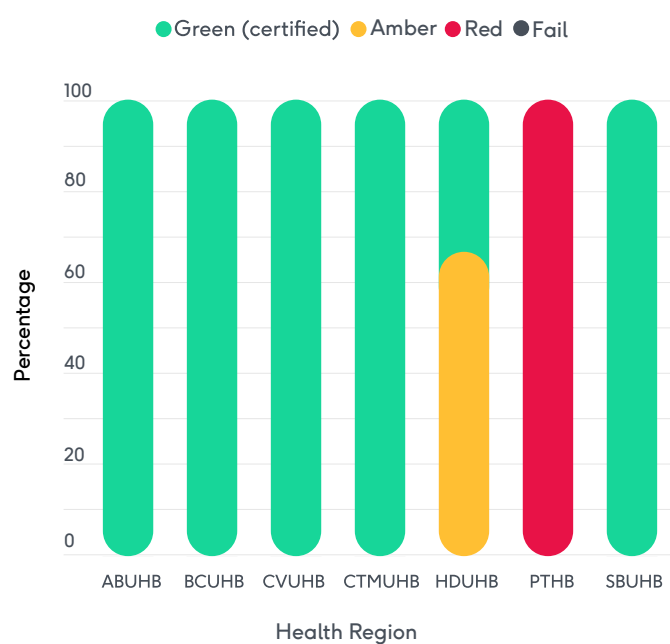


Fig. 3c Wales



Part four

Covid-19 analysis



2%

drop in proportion
of people with 3 or
more comorbidities
receiving CR

Part four: Covid-19 analysis

Comparison of patient demographics and modes of delivery before and during Covid-19

Covid-19 has had an unprecedented impact on NHS service provision leading to significant change in delivery of CR. In England, hospital admissions for acute coronary syndrome declined by 40% compared with a similar period in 2019 due to the pandemic (Mafham et al 2020).

There were also large-scale changes seen in NHS CR staff working practices involving redeployment to front-line duties and an urgent need to shift from community- and hospital-based CR services to home-based approaches (including digital solutions). Until a vaccine is available there remains an ongoing need to limit the spread of the disease in clinically vulnerable patient groups such as those who have had an MI or those with HF. This sets the scene for significant change in the CR landscape. Such change could potentially disadvantage thousands of patients and widen the inequalities gap, but also brings opportunities to innovate services and offer a more extensive menu of CR delivery modes. NACR, the BHF and BACPR are keen to capture service changes made in response to Covid-19 and use these insights to enhance the overall quality of service delivery for the benefit of the tens of thousands of patients that require CR.

During Covid-19, programmes have continued to directly enter patient-level data into NACR where possible, providing the national audit team the opportunity to evaluate service change and adjustments made in response to Covid-19.

The following analysis is based on patients selected from the database with their initiating cardiac event occurring between Aug 2019-July 2020. Patients were then split into two groups: the six months before Covid-19 (Aug 2019-Jan 2020) and the six months during Covid-19 (Feb-July 2020).

During Covid-19 the proportion of males and females and age of patients recruited has remained comparable (Table 8). There was a slight change (–0.3%) in the proportion of women and there was an overall reduction in total number of patients attending.

Part four: Covid-19 analysis

Table 8: Age and gender of patients receiving CR before and during Covid-19

Aug 19-Jan 20					Feb-July 20			
	Count	%	Mean Age	SD	Count	%	Mean Age	SD
Male	37352	71.0	66	12	25305	71.3	66	12
Female	15273	29.0	70	13	10195	28.7	70	13
Total	52625		67	13	35500		67	13

Due to rounding of data, figures within this table may not add up to 100%

SD = Standard Deviation

The analysis in Table 9 shows that, between the two time periods, there was a small reduction in patients who are single, divorced, widowed and separated. By contrast, the proportion of patients in a permanent partnership or married increased. Previous audit data analysis (NACR 2019) highlighted that those not in a partnership or married were already less likely to attend CR. The latest data indicate that adjustments for Covid-19 may have further increased inequality in access to CR for these groups.

Table 9: Marital status of patients receiving CR before and during Covid-19

Aug 19-Jan 20			Feb-July 20		Proportional Change
	Count	%	Count	%	
Single	3792	11.5	2453	11.5	-0.1
Married	22707	68.9	14948	69.8	0.9
Permanent Partnership	1736	5.3	1151	5.4	0.1
Divorced	1597	4.8	984	4.6	-0.3
Widowed	2733	8.3	1652	7.7	-0.6
Separated	382	1.2	222	1.0	-0.1
Total	32947		21410		

Due to rounding of data, figures within this table may not add up to 100%

Another emerging trend is that patients with White British ethnicity have gained greater access to CR during Covid-19 whereas those from all other ethnic groups have either had less access or remain the same as previous years (Table 10). Covid-19 has worsened inequalities for already under-served patients from White and Black Caribbean, Other Mixed Background, Indian, Pakistani and Bangladeshi ethnic groups.

Part four: Covid-19 analysis

Table 10: Ethnicity of patients receiving CR before and during Covid-19

		Aug 19-Jan 20		Feb-July 20		Proportional Change
		Count	%	Count	%	
White	British	34514	79.4	22842	80.7	1.3
	Irish	693	1.6	381	1.3	-0.3
	Any Other White Background	1364	3.1	821	2.9	-0.2
Mixed/ Multiple ethnic groups	White and Black Caribbean	67	0.2	35	0.1	-0.1
	White and Black African	34	0.1	15	0.1	0.0
	White and Asian	69	0.2	52	0.2	0.0
	Any other mixed background	121	0.3	48	0.2	-0.1
Asian/ Asian/ British	Indian	1101	2.5	630	2.2	-0.3
	Pakistani	1035	2.4	543	1.9	-0.5
	Bangladeshi	284	0.7	132	0.5	-0.2
	Chinese	556	1.3	327	1.2	-0.1
	Any other Asian background	58	0.1	34	0.1	0.0
Black/African/ Caribbean/ Black British	Caribbean	246	0.6	131	0.5	-0.1
	African	168	0.4	90	0.3	-0.1
	Any other Black background	80	0.2	56	0.2	0.0
Other ethnic group	Any other ethnic group	445	1.0	276	1.0	0.0
	Not Stated	2650	6.1	1898	6.7	0.6

Due to rounding of data, figures within this table may not add up to 100%

There was a 4% reduction in the number of surgical patients and a 1.4% drop in people with HF accessing CR in the first six months of Covid-19 (Table 11). There was a 5% increase in primary PCIs for people presenting with MI (MI + PCI) and a small reduction (~1%) in elective PCI. The drop in number of people presenting at A&E with MI and chest pain during lockdown and the corresponding reduction in cardiology procedures is a worrying trend. This is confounded further by a lack of access to rehabilitation services which we know, through robust evidence, is beneficial for patients following cardiac surgery (NICE 2013) and people with HF (NICE 2018). The 1.4% drop in HF patients attending CR may appear small but is equivalent to a 20% relative reduction which is likely to lead to an increased burden on NHS services through greater hospital readmissions (Taylor et al 2014).

Part four: Covid-19 analysis

Table 11: Diagnosis and treatment groups of patients receiving CR before and during Covid-19

Diagnosis and Treatment Groups	Aug 19-Jan 20		Feb-July 20		Proportional Change
	Count	%	Count	%	
MI	5192	9.8	3753	10.5	0.7
MI/PCI	17038	32.0	13276	37.0	5.0
PCI	8370	15.7	5363	14.9	-0.8
CABG	5963	11.2	3127	8.7	-2.5
HF	3612	6.8	1935	5.4	-1.4
Angina	1827	3.4	1339	3.7	0.3
Valve surgery	5435	10.2	3116	8.7	-1.5
Other	5732	10.8	3982	11.1	0.3

Due to rounding of data, figures within this table may not add up to 100%

Previous NACR reports have shown that UK CR has been effective at recruiting patients with with multiple comorbidities. There is, however, an emerging trend (Table 12) that fewer multimorbid patients (-2%) are being identified by CR teams while the proportion of non-comorbid patients has increased by 2.4%.

Table 12: Comorbidity profile of patients receiving CR before and during Covid-19

Number of comorbidities	Aug 19-Jan 20		Feb-July 20	
	Count	%	Count	%
0	18541	34.9	13386	37.3
1-2	25974	48.9	17386	48.4
3+	8654	16.3	5119	14.3

Due to rounding of data, figures within this table may not add up to 100%

In 2019 NACR and NHS Digital developed a new 'mode of delivery' field showing 11 possible modes of delivery split into group-based/centre-based, facilitated, and self-managed (Table 13). For ten years, the group-based CR has dominated the CR offer with 80% of patients receiving it, predominately in a hospital setting as out-patients. Covid-19 has transformed previous trends with considerable reductions in group-based exercise and education of 36% and 29%, respectively. Self-managed approaches supported by CR staff have all increased, although the majority of these programmes are using less formalised versions of CR that do not require trained facilitators. NACR intends to survey programmes to find out more about this new mode of delivery. In addition, we will capture routine practice patient outcomes to validate and evaluate the emerging modes of delivery, such as REACH-HF, recognised by a BMJ service award in 2020.

Part four: Covid-19 analysis

Table 13: Mode of CR delivery before and during Covid-19

	Aug 19-Jan 20		Feb-July 2020		Change in % using mode
	% of patients	% stated CR mode alone	% of patients	% stated CR mode alone	
Group Education	56	24	27	29	-29
Group Exercise	71	2	36	3	-36
Heart Manual (facilitated by trained CR staff)	4	77	5	87	+1
REACH-HF (facilitated by trained CR staff)	<1	81	<1	68	0
Angina Plan (facilitated by trained CR staff)	<1	60	<1	0	0
Angioplasty Plan (facilitated by trained CR staff)	1	86	1	96	+1
Other self-managed (CR staff supported)	29	53	45	80	+16
Web-Based Activate your Heart	1	53	3	78	+2
Web Other	2	46	5	62	+3
App-Based	1	50	1	76	+1
Patient-led reduced level of CR staff support	10	50	15	73	+5

Due to rounding of data, figures within this table may not add up to 100%

N=18705 Aug 2019-Jan 2020, N=9243 Feb-July 2020

Part four: Covid-19 analysis

Figure 4 shows a summary of CR mode of delivery by category, and highlights a significant increase in self-managed CR of 36% and an 8% reduction in hybrid approaches (group + self-managed). This is a substantial change in the mode of CR delivery across England, Northern Ireland and Wales compared with previous audit reports where self-managed CR remained unchanged, at less than 10%, for the past five years. Next year's report will assess the quality and outcomes in terms of patient benefit.

Figure 4: Mode of CR delivery categorised by Group, Self-managed and Hybrid before and during Covid-19

Fig. 4a Modes of delivery: Aug 2019 - Jan 2020

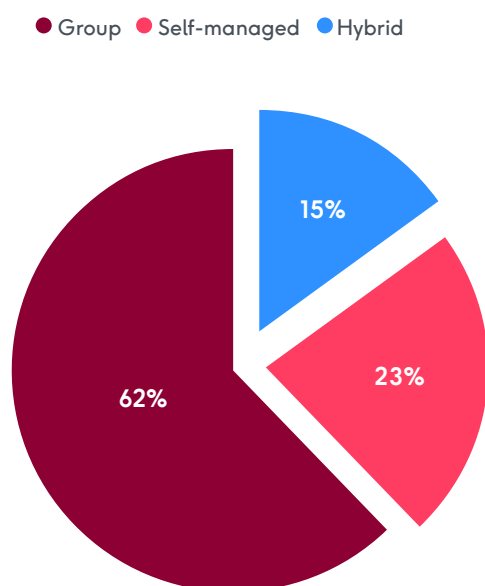
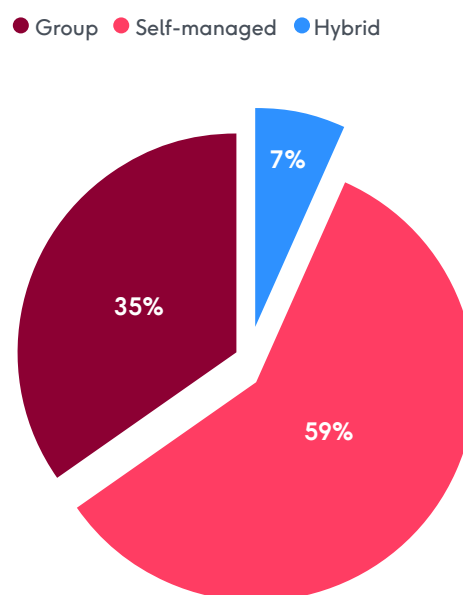


Fig. 4b Modes of delivery: Feb - July 2020



Note: the change in group delivery shown in Table 13 is mirrored in the reduction of group and hybrid categories between the two time periods. A reduction of 28% (group) plus 8% (hybrid) equates to the 36% reduction in group exercise shown in Table 13

Part five

Recommendations and actions



2%

rise in proportion
of people with
no comorbidities
receiving CR

Part five: Recommendations and actions

Recommendations and actions

This year's 2020 NACR report has highlighted significant progress in the quality of CR services and quantified the benefits of reducing waiting times.

Importantly the report has captured changes in service delivery in response to Covid-19, which will form a new baseline from which to evaluate CR over the next few years.

Key recommendations

- Support CR programmes to continue to use a wider portfolio of CR modes of delivery including digital options to optimise recruitment of patients and increase uptake
- Ensure the quality and effectiveness of CR delivery in relation to the emerging modes of delivery
- Continue to pursue innovation in the remote assessment of patients
- Support CR programmes to adapt service delivery in order to tackle inequalities in accessing CR

Actions

1. Monitor changes in CR mode of delivery reflecting recent changes in NHS practice
2. Monitor the quality and effectiveness of these emerging home and digital modes of delivery
3. NACR to monitor variation in quality and effectiveness in different regions and nations
4. NACR to carry out an analysis of patient outcomes for the 12 months before and after the start of the Covid-19 pandemic

Please share good practice with the BHF and keep ahead of the curve through the new BACPR online CR education courses.

Acknowledgements

The BACPR is committed to ensuring that all CR programmes in the UK offer quality CR that is known to benefit patients. Services benefit from BACPR's commitment to offering education and training for CR clinicians. The BACPR/NACR joint NCP_CR is a world-leading quality assurance project that owes much to the leadership of the BACPR. A big thank you to Sally Hinton (BACPR Executive Director), Vivienne Stockley (Education Co-ordinator), Professor Susan Dawkes (BACPR President) and Dr Hayes Dalal (NCP_CR co-chair).

NHS Digital continues to add value through its support in hosting and quality assuring our data, allowing us to utilise routine practice data to reduce inequalities and improve services.

As the patient voice for CR in the UK the Cardiovascular Care Partnership UK (CCPUK) makes NACR and its findings more meaningful for patients and carers. Special thanks to Ken Timmis and Trevor Fernandes (CCPUK).

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List of tables

Table 1	CR programme data by nation and Health Region	14
Table 2	Total number of programmes, programmes included in NCP_CR, programmes registered via NACR by nation	15
Table 3	CR population by ethnic group, gender and comorbidities	18
Table 4	Time (days) from post-discharge referral to start of core CR	21
Table 5	NCP_CR key performance indicators (KPIs)	24
Table 6	NCP_CR classification scale	25
Table 7	NCP_CR certification status for all CR programmes 2020	25
Table 8	Age and gender of patients receiving CR before and during Covid-19	29
Table 9	Marital status of patients receiving CR before and during Covid-19	29
Table 10	Ethnicity of patients receiving CR before and during Covid-19	30
Table 11	Diagnosis and treatment groups of patients receiving CR before and during Covid-19	31
Table 12	Comorbidity profile of patients receiving CR before and during Covid-19	31
Table 13	Mode of CR delivery before and during Covid-19	32

List of figures

Figure 1 a/b/c	Proportion of male and female participants by age and nation/programme	17
Figure 2 a/b/c	Time from referral to start of CR by programme and nation	22
Figure 3 a/b/c	NCP_CR status by Health Regions across England, Northern Ireland and Wales	26
Figure 4 a/b	Mode of CR delivery categorised by Group, Self-managed and Hybrid before and during Covid-19	33

List of Supplements

In addition to the data and figures within this report, NACR provides local and regional reports online. These supplements can be used to inform services and drive improvement. The full list of available supplements is below and they can be accessed at www.cardiacrehabilitation.org.uk/current-annual-report.htm

Certification Supplement

List of Programmes

Supplement Participation Report

Priority Groups Report

Staffing Report

Age and Gender Report

Ethnicity Report

Marital Status Report

Employment Status Report

Comorbidities Report

Time from Referral to Start of Core Rehab Report

Pre and Post Assessments Report

Duration of Core Rehab Report

Exercise Outcome Report

HADS Anxiety Report

HADS Depression Report

Early CR Report (new for 2020)

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