Queensland Cardiac Clinical Network
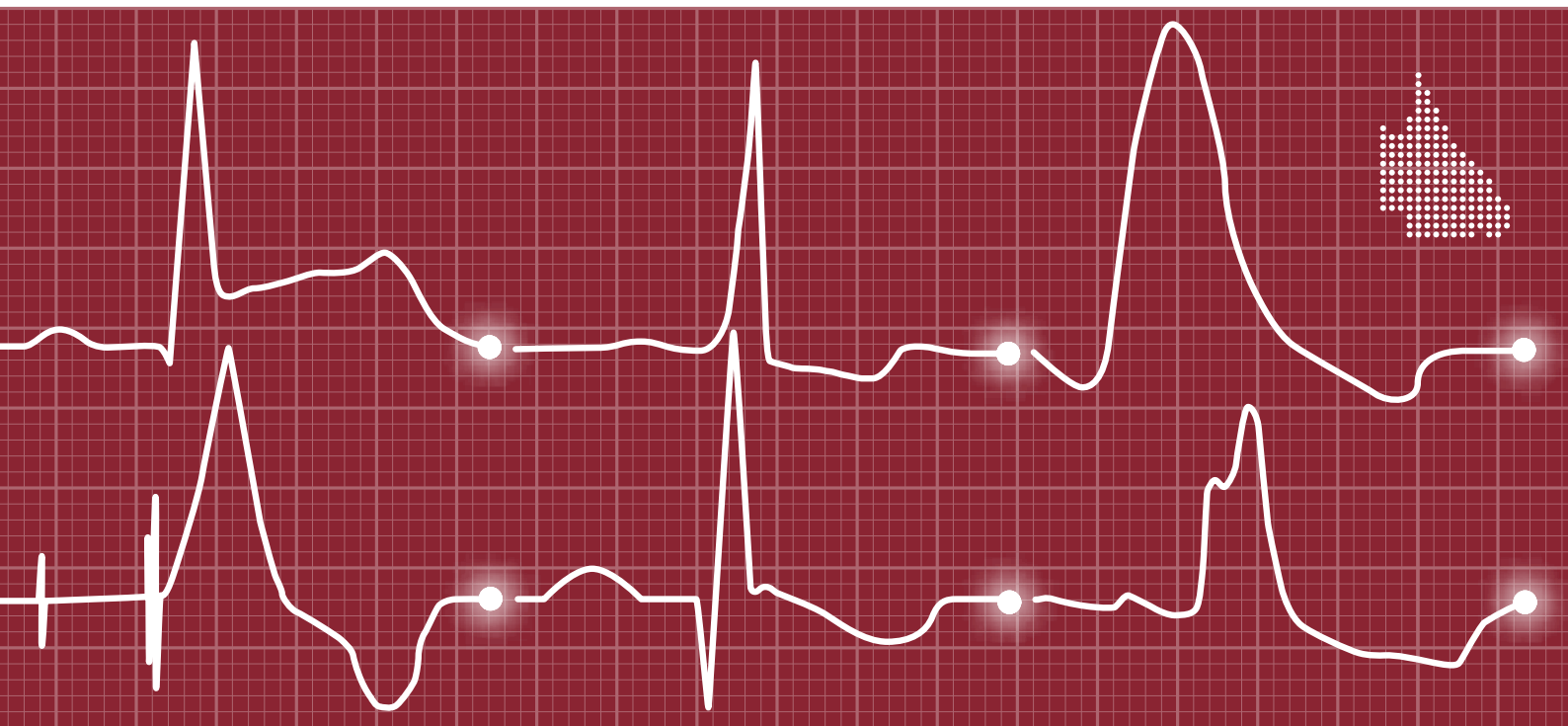## Queensland Cardiac Outcomes Registry
2022 Annual Report
Cardiac Rehabilitation Audit

Improvement | Transparency | Patient Safety | Clinician Leadership | Innovation

Queensland Government

For more information contact:
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An electronic version of this document is available at:
clinicalexcellence.qld.gov.au/priority-areas/ clinician-engagement/queensland-clinical-networks/ cardiac

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1 Message from the Queensland Cardiac Clinical Network Chair

It is with great pleasure that we present the Annual Report of the Queensland Cardiac Outcomes Registry. This report serves as a testament to the relentless pursuit of excellence in cardiovascular care within the Queensland region. The data, analyses, and insights presented here reflect the collective efforts of our passionate team, whose commitment to improving patient outcomes remains unwavering.

QCOR remains one of the most comprehensive clinician-led clinical registries in the country, incorporating modules reporting on interventional cardiology, cardiac surgery, thoracic surgery, electrophysiology and pacing, cardiac rehabilitation and heart failure support services. Through rigorous data collection, innovative research endeavours, and collaborative efforts, we have made significant strides in enhancing patient outcomes, advancing medical knowledge, and fostering a healthier future for our community.

We continue to keenly await the delivery of a contemporary statewide cardiovascular information system for diagnostic and interventional cardiology and echocardiography. Following a successful procurement process, the platform for a forward-thinking, all-encompassing solution has been laid and throughout the process to date, the collegiality and cooperation of cardiac clinicians throughout the state has once again been exemplified.

In the era of expanding datasets and advanced analytics, our commitment will be to translating the knowledge gained from this program into information supporting patient safety and quality initiatives. We are looking forward to expanded capability for data collection and analysis to become part of real-time care delivery, recognising always the patient as the focus of our efforts. We trust that this report will serve as a valuable for knowledge exchange, and ultimately, better cardiovascular outcomes for our community.

Dr Rohan Poulter and Dr Peter Stewart
Co-chairs, Queensland Cardiac Clinical Network

2   Acknowledgements

This collaborative report was produced by the SCCIU, audit lead for QCOR for and on behalf of the Statewide Cardiac Clinical Network. This would not be possible without the tireless work of clinicians in contributing quality data and providing quality patient care, while the contributions of QCOR committee members and others who had provided writing or other assistance with this year's Annual Report is also gratefully acknowledged.

QCOR Interventional Cardiology Committee

- Dr Sugeet Baveja, Townsville University Hospital
- Dr Yohan Chacko, Ipswich Hospital
- Dr Christopher Hammett, Royal Brisbane & Women's Hospital
- Dr Dale Murdoch, The Prince Charles Hospital
- A/Prof Atifur Rahman, Gold Coast University Hospital
- Dr Sam Sidharta, Rockhampton Hospital
- Dr Yash Singbal, Princess Alexandra Hospital
- Dr Gregory Starmer, Cairns Hospital
- Dr Michael Zhang, Mackay Base Hospital
- Dr Rohan Poulter, Sunshine Coast University Hospital (Chair)

QCOR Cardiothoracic Surgery Committee

- Dr Manish Mathew, Townsville University Hospital
- Dr Rishendran Naidoo, Metro North Hospital and Health Service
- Dr Anil Prabhu, The Prince Charles Hospital
- Dr Andrie Stroebel, Gold Coast University Hospital
- Dr Christopher Cole, Princess Alexandra Hospital (Chair)

QCOR Electrophysiology and Pacing Committee

- Dr Naresh Dayananda, Sunshine Coast University Hospital
- A/Prof John Hill, Princess Alexandra Hospital
- Dr Paul Martin, Royal Brisbane & Women's Hospital
- Dr Caleb Mengel, Toowoomba Hospital
- Dr Sachin Nayyar, Townsville University Hospital
- Dr Kevin Ng, Cairns Hospital
- Dr Robert Park, Gold Coast University Hospital
- Dr Russell Denman, The Prince Charles Hospital (Chair)

QCOR Cardiac Rehabilitation Committee

- Ms Wendy Fry, Cairns and Hinterland Hospital and Health Service
- Ms Emma Harmer, Metro South Hospital and Health Service
- Ms Audrey Miller, Health Contact Centre – Self Management of Chronic Conditions Service
- Ms Samara Phillips, Statewide Cardiac Rehabilitation Coordinator
- Ms Rebecca Pich, Metro South Hospital and Health Service
- Ms Alexandra Samuels, Gold Coast Hospital and Health Service
- Ms Michelle Aust, Sunshine Coast University Hospital (Co-Chair)
- Ms Maura Barnden, Metro North Hospital and Health Service (Co-Chair)

QCOR Heart Failure Support Services Committee

- Ms Melanie Burgess, Ipswich Hospital
- Dr Wandy Chan, The Prince Charles Hospital
- Ms Deepali Gupta, Queen Elizabeth II Hospital
- Ms Annabel Hickey, Statewide Heart Failure Services Coordinator
- Dr Rita Hwang, PhD, Princess Alexandra Hospital
- Ms Sophie Lloyd, Royal Brisbane & Women's Hospital
- Ms Menaka Louis, Gold Coast Hospital and Health Service
- Ms Kellie Mikkelsen, Redcliffe Hospital
- Ms Melissa Moore, Townsville University Hospital
- Ms Rachelle Mulligan, Princess Alexandra Hospital
- Ms Louvaine Wilson, Toowoomba Hospital
- Prof John Atherton, Royal Brisbane & Women's Hospital (Chair)

Statewide Cardiac Clinical Informatics Unit

- Mr Michael Mallouhi
- Mr Marcus Prior
- Dr Ian Smith, PhD
- Mr William Vollbon

Queensland Ambulance Service

- Dr Tan Doan, PhD

3   Introduction

The Queensland Cardiac Outcomes Registry (QCOR) is an ever-evolving clinical registry and quality program established by the Queensland Cardiac Clinical Network (QCCN) in partnership with statewide cardiac clinicians and made possible through the funding and support of Clinical Excellence Queensland. QCOR provides access to quality, contextualised clinical and procedural data to inform and enhance patient care and support the drive for continual improvement of quality and safety initiatives across cardiac and cardiothoracic surgical services in Queensland.

QCOR is a clinician-led program, and the strength of the Registry would not be possible without this input. The Registry is governed by clinical committees providing direction and oversight over Registry activities for each cardiac and cardiothoracic specialty area, with each committee reporting to the QCCN and overarching QCOR Advisory Committee. Through the QCOR committees, clinicians are continually developing and shaping the scope of the Registry based on contemporary best practices and the unique requirements of each clinical domain.

Goals and mission

- Identify, through data and analytics, initiatives to improve the quality, safety and effectiveness of cardiac care in Queensland.

- Provide data, analysis expertise, direction and advice to the Department of Health and Hospital and Health Services concerning cardiac care-related service planning and emerging issues at the local, statewide and national levels.

- Provide decision support, expertise, direction and advice to clinicians caring for patients within the domain of cardiac care services.

- Develop an open and supportive environment for clinicians and consumers to discuss data and analysis relative to cardiac care in Queensland.

- Foster education and research in cardiac care best practice.

Registry data collections and application modules are maintained and administered by the Statewide Cardiac Clinical Informatics Unit (SCCIU), which forms the business unit of QCOR. The SCCIU performs data quality, audit and analysis functions, and coordinates individual QCOR committees, whilst also providing expert technical and informatics resources and subject matter expertise to support continuous improvement and development of specialist Registry application modules and reporting.

The SCCIU team consists of:

Mr Graham Browne, Database Administrator	Mr Michael Mallouhi, Clinical Analyst
Mr Marcus Prior, Informatics Analyst	Mr William Vollbon, Manager*
Dr Ian Smith, PhD, Biostatistician	Mr Karl Wortmann, Application Developer

* Principal contact officer/QCOR program lead

The application custodian for QCOR is the Executive Director, Healthcare Improvement Unit, CEQ, while data custodianship for the overarching data collection of QCOR is the Chair/s of the QCCN. The individual modular data collections are governed by the Chair of each of the individual QCOR specialty committees.

The QCOR Clinical specialty committees provide direction and oversight for each domain of the Registry. An overarching QCOR Advisory Committee provides collective oversight with each of these groups reporting to the QCCN. Through the QCOR committees, clinicians are continually developing and shaping the scope of the Registry based on contemporary best practices and the unique requirements of each clinical domain.

QCOR manages the Cardiothoracic Surgery Quality Assurance Committee which has been formed under Part 5 of the *Hospital and Health Boards Regulation 2023* to facilitate the participation of clinicians and administrators responsible for the management and delivery of cardiac services. This group enables the peer review of safety and quality of the cardiothoracic services delivered in Queensland and guides any service improvement activities that may be required.
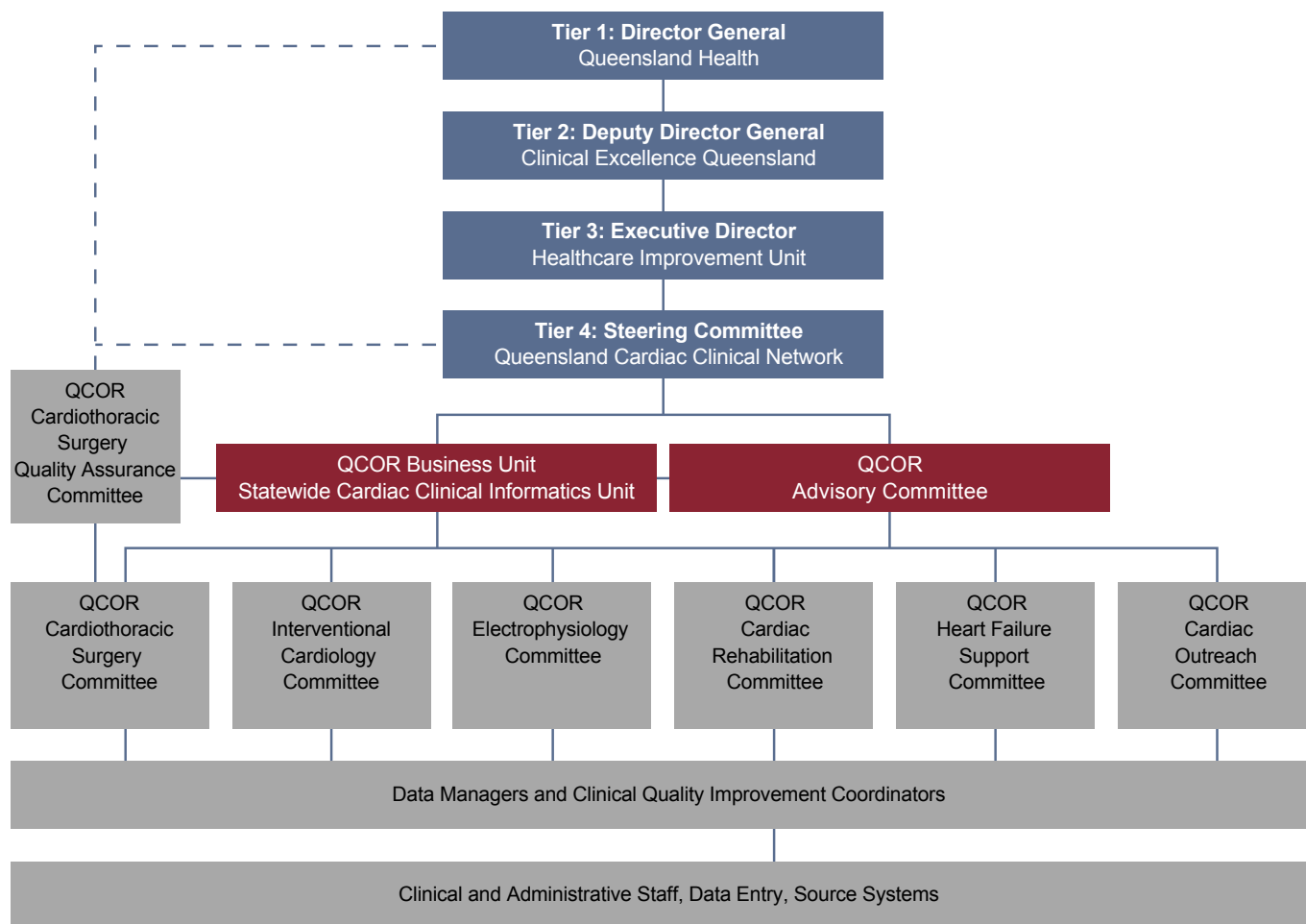
Figure 1:   Governance structure

QCOR functions in line with the accepted and endorsed clinical quality registry feedback loop where improvements in clinical care through data-based initiatives and regular interaction with clinicians and stakeholders.

QCOR acts under a well-defined data custodianship model that ensures clearly defined processes and usage of the data collected. The operation of QCOR is guided by the principles outlined by the Australian Commission on Safety and Quality in Health Care in the Framework for Australian clinical quality registries.

The Registry data collection is a blend of clinician-entered data along with various data linkages activities as outlined above. The data is scrutinised using in-app data validations and automated routine data quality reporting. The data quality auditing processes aim to identify and resolve incomplete or inaccurate data to ensure clinician trust in the analysis and outcome reporting process, along with routine reporting and requests for information functions.

In 2014, the Australian Commission on Safety and Quality in Healthcare published a Framework for Australian clinical quality registries*. Since then, QCOR has worked to align itself with these guidelines and subsequent frameworks and standards which form the basis of its quality and safety program. It is recognised that clinical quality registries collect, analyse and report back essential risk-adjusted clinical information to patients, consumers, frontline clinicians and government, with a focus on quality improvement.

The measurement of clinical indicators and benchmarks aims to support the feedback of safety and quality data to several levels of the health system, including consumers, clinicians, administrators and funders. Meaningful metrics are required to understand what the major safety issues are across the care continuum, proactively mitigate patient safety risks and stimulate improvement. Evidence demonstrates that safety and quality improve when clinicians and managers are provided with relevant and timely clinical information.

Through the availability of data insights, clinical reporting and clinical documentation produced by both patient-facing and technical solutions. QCOR has allowed the instantaneous delivery of clinical reports and documentation to clinicians via enterprise solutions. Data insights, performance measure and clinical indicator reporting is also made available in real time via dashboards and reports delivered to clinicians at a frequency and medium of their choosing. Access to real-time data enables key staff to plan and deliver more efficient care to more patients.

QCOR data and analytics have informed and supported statewide healthcare planning activities for capital expansion as well as made possible market share activities for procurement of high-cost clinical consumables resulting in multimillion dollar savings to the healthcare system.
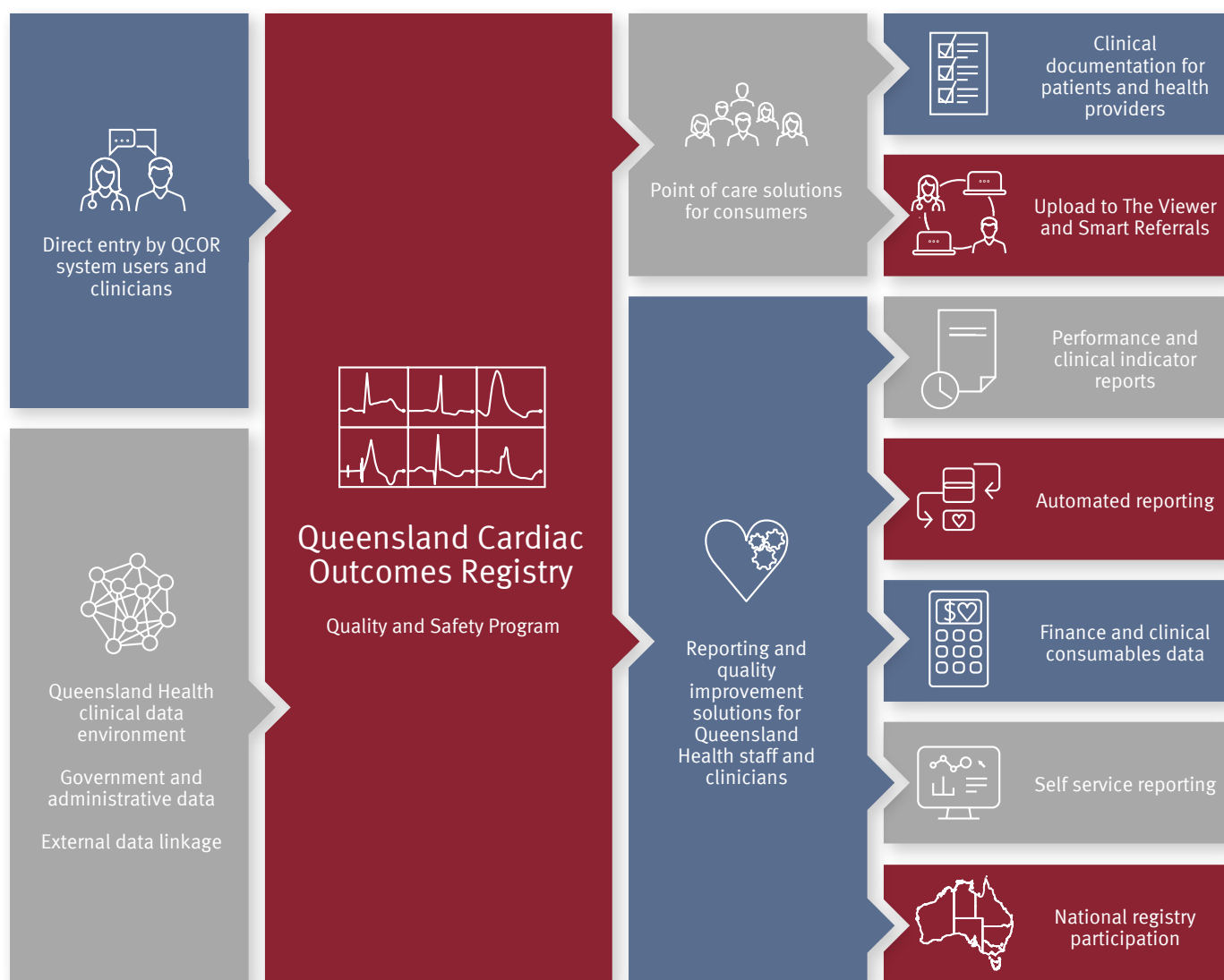
Figure 2:   QCOR data flow

* The Australian Commission on Safety and Quality in Health Care (ACSQHC). Framework for Australian clinical quality registries. Sydney: ACSQHC; 2014

Queensland Cardiac Outcomes Registry

The Health of Queenslanders

›5.2 million population

4.6%
Aboriginal and Torres Strait Islander population*

1 in 5
Queenslanders admitted to hospital†

13%
of deaths attributed to coronary heart disease†

11%
hospital spending on cardiovascular disease‡

13%
of total burden of disease caused by cardiovascular disease†

Comorbidities

10%
smoke daily*

21%
have measured high blood pressure‡

4.5%
have diabetes§

2 in 3
are overweight or obese‡

Mortality

1 in 5
of all deaths due to cardiovascular disease||

5.8%
of all deaths due to lung cancer||

5.4 per 1,000
mortality rate in Queensland†

9.6 per 1,000
mortality rate for Indigenous Queenslanders†

Figure 3: QCOR 2022 infographic

* Australian Bureau of Statistics. (2022, July 1). Queensland: Aboriginal and Torres Strait Islander population summary. ABS. https://www.abs.gov.au/articles/queensland-aboriginal-and-torres-strait-islander-population-summary

† Queensland Health. (2020). The health of Queenslanders 2020. *Report of the Chief Health Officer Queensland*. Queensland Government: Brisbane

‡ Australian Bureau of Statistics. (2019). *National health survey: first results, 2017-18*. Cat. no. 4364.0.55.001. ABS: Canberra

§ Diabetes Australia. (2018). *State statistical snapshot: Queensland*. As at 30 June 2018

|| Australian Institute of Health and Welfare (2021). MORT (Mortality Over Regions and Time) books: State and territory, 2015–2019. https://www.aihw.gov.au/getmedia/8967a11e-905f-45c6-848b-6a7dd4ba89cb/MORT_STE_2015_2019.xlsx.aspx

2022 Activity at a Glance
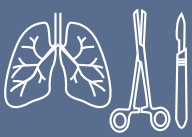
What's New?

Cardiac Surgery health equity spotlight	Cardiac Rehabiliation expanded outcomes audit
Heart Failure Support Services SGLT2 inhibitor indicator	Interventional Cardiology adjunct devices review

Interventional Cardiology

4,818
percutaneous coronary interventions

617
structural heart disease interventions

335
transcatheter aortic valve replacements

14,769
total coronary procedures

Cardiothoracic Surgery

2,230
adult cardiac surgeries

918
adult thoracic surgeries

Electrophysiology & Pacing

5,305
electrophysiology and pacing procedures

3,611
cardiac implantable electronic device procedures

Heart Failure Support Services

6,438
heart failure support services referrals
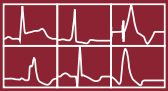
Cardiac Rehabilitation

9,317
cardiac rehabilitation referrals

Paediatric Cardiac Surgery

292
paediatric cardiac surgeries

Clinical Indicator Progress

85 mins
median first diagnostic ECG to reperfusion time for primary PCI

0.2%
procedural tamponade rate for cardiac device and electrophysiology procedures

92%
of patients referred to a heart failure support service on an ACEI, ARB or ARNI at discharge

92%
of cardiac rehabilitation referrals within 3 days of discharge

1.5%
mortality rate for coronary artery bypass surgery at 30 days

Cardiac Rehabilitation Audit

1 Message from the Cardiac Rehabilitation Committee Chair

Cardiac rehabilitation (CR) is evidence-based therapy to assist those with cardiovascular disease recover and prevent the recurrence of secondary events, aiming to reduce both hospital readmissions and mortality rates. Despite the benefits, referral and participation rates have traditionally been low, however, there has been little data recorded until the introduction of QCOR. The 2022 Annual Report for CR services in Queensland marks the sixth year of data collection, collating input from 59 Queensland Health CR service providers.

QCOR is a data-rich registry, which continues to evolve. The data gathered provides valuable information for ongoing service development and resourcing and aligns with national quality indicators and clinical standards. It enables services to monitor and evaluate performance and benchmark against statewide data.

The data obtained from QCOR has enabled the publication of the Clinical Standards for Cardiac Rehabilitation (2023). This Queensland Health publication has been endorsed by the Queensland Cardiac Clinical Network and the Statewide Cardiac Rehabilitation Collaborative. It aims to standardise CR delivery in Queensland ensuring that service delivery is evidence-based, person-centred, culturally aware, flexible, and applicable to all modes of delivery with consistent and clear messaging. The Clinical Standards outline essential components for CR programs incorporating both Queensland and National CR Indicators with desired target ranges. Data obtained within QCOR is essential to evaluate service performance and in the future, we will see this data aligned with the Clinical Standards.

With the recent global pandemic, we saw innovative models of service delivery moving from traditional face-to-face programs to telehealth, home-based programs and hybrid models. This was necessary to ensure patients still received some form of care to improve their outcomes post cardiovascular event. To date, the data collected has been unable to discriminate between the different models of care that exist across Queensland. When reviewing the outcomes, it is challenging to interpret, as the intervention experienced may have been quite different across services. This year (2023) we have implemented a new model of care application into the QCOR data collection. This will enable outcomes to be reviewed according to the type of CR program experienced and assist in informing future delivery of CR. This information we can look forward to in next year's Annual Report.

Data collected within QCOR is not only valuable to the clinician and health service but also to the patient accessing the service and their general practitioner. QCOR enables the generation of reports including their pre and post assessment data and an ongoing management plan which are directly communicated to The Viewer, the interface with primary care. This is valuable for patients to see the positive changes that CR intervention has made to their health and encourages them to continue to adopt these healthy lifestyle measures, as well as provide timely feedback to their general practitioner.

We would like to take this opportunity to thank the QCOR Committee and the clinicians for their ongoing commitment and support to the QCOR module. As clinicians, we understand the clinical demands and appreciate everyone's time incorporating QCOR into standard practice and using the QCOR CR module for direct entry of assessment information. With six years of data collection to date and expansion of the dataset, we know that this will only assist in future research opportunities and developing world-class CR programs with optimal patient outcomes.

Maura Barnden and Michelle Aust
Co-chairs, QCOR Cardiac Rehabilitation Committee

2   Key findings

This sixth Cardiac Rehabilitation (CR) Audit examines the characteristics and outcomes for patients referred to and assessed by public CR services in Queensland. It also outlines clinical indicator performance for participating services.

- There were 59 public cardiac rehabilitation (CR) sites that contributed data to QCOR.

- A total of 9,317 referrals were made to public CR programs across Queensland. A further 1,428 referrals were declined, unsuitable or referred outside of Queensland Health at the point of first contact.

- Approximately 72% of referrals originated from an inpatient setting, while 16% of referrals originated from outside of Queensland Health.

- There were 6,385 referrals (69%) which proceeded to a pre assessment. The most common reasons that the pre assessment did not take place was that the patient declined, was medically unsuitable or inappropriate, had been uncontactable or failed to attend the appointment.

- Male patients accounted for 70% of all CR referrals.

- The median age of patients was 66 years, with three quarters of patients aged 57 years and above. There was considerable variation in median age between Aboriginal and Torres Strait Islander patients (56 years) and patients of other descent (67 years).

- The total proportion of Aboriginal and Torres Strait Islander patients was 6.4%. Large geographical variance was noted, with sites in North Queensland having a significantly higher proportion of Aboriginal and Torres Strait Islander patients.

- Overall, 68% of referrals had a pre assessment diagnosis of ischaemic heart disease.

- The most common procedure undergone by patients who attended a CR pre assessment was a percutaneous coronary intervention, which had been performed for 44% of patients. There were 15% of patients who had undergone coronary artery bypass grafting.

- Only 35% of patients were recorded as being sufficiently active at pre assessment.

- Completion of a timely referral for Queensland Health inpatients (within 3 days of discharge from hospital) was achieved in 92% of cases.

- A timely overall journey occurred in 53% of cases (Queensland Health inpatients referred within 3 days of discharge and assessed by CR program within 28 days of discharge).

- 48% of patients who completed a pre assessment continued CR to the completion of a post assessment.

- Where a six minute walk test was undertaken, 76% patients demonstrated an improved result from pre to post assessment, with 56% recording an increase of greater than 50 metres.

- When measured using the AQoL-4D instrument, 60% of patients demonstrated an improved quality of life score after CR intervention. When quality of life was measured using other metrics, 54% of participants reported a feeling of improved health following completion of CR, while 51% of patients reported an improved mood at post assessment compared to pre assessment, and 43% of patients reported that their fitness had improved following completion of the program.

- There was a 38% increase in patients assessed as being sufficiently active at completion of the program.

Cardiac Rehabilitation

3 Participating sites

Table 1: Participating CR sites

Legend: ⊘ Engaged and contributing ◑ Partially contributing (<50% of referrals) ○ Not contributing

HHS/Organisation	CR program	Locations	2020	2021	2022
Cairns and Hinterland	Cairns Outpatient CR Program	Cairns	⊘	⊘	⊘
	Cassowary Area CR	Innisfail, Tully	⊘	⊘	⊘
	Tablelands CR	Atherton, Mareeba	⊘	⊘	⊘
	Mossman CR and Prevention Program	Mossman	⊘	⊘	⊘
Central Queensland	Community Health CR	Gladstone	⊘	⊘	⊘
	Biloela CR Program	Biloela	⊘	⊘	⊘
	CR Outpatient Program	Rockhampton, Capricorn Coast	⊘	⊘	⊘
	Mount Morgan CR	Mount Morgan	⊘	⊘	⊘
Central West	Longreach and Central West CR Program	Longreach	⊘	⊘	⊘
		Blackall	⊘	⊘	⊘
		Winton	⊘	⊘	⊘
		Barcaldine*	⊘	⊘	⊘
Darling Downs	Toowoomba Hospital Heart Care	Toowoomba	⊘	⊘	⊘
	Warwick CR Service	Warwick	⊘	⊘	⊘
	Chinchilla-Miles CR Service	Chinchilla, Miles	⊘	⊘	⊘
	Dalby-Tara CR Service	Dalby, Tara	⊘	⊘	⊘
	Kingaroy Hospital South Burnett CR	Kingaroy	⊘	⊘	⊘
	Goondiwindi CR	Goondiwindi	⊘	⊘	⊘
	Texas OPCR Program	Texas	○	○	N/A
	Stanthorpe Health CR Program	Stanthorpe	○	○	N/A
Gold Coast	Gold Coast Heart Health Service	Robina	⊘	⊘	⊘
HCC†	SMoCC‡	Health Contact Centre	⊘	⊘	⊘
Mackay	Mackay Heart Health Service	Mackay	⊘	⊘	⊘
	Mackay Rural District CR	Proserpine, Bowen	○	○	◑
Metro North	Complex Chronic Disease	Caboolture, Chermside, North Lakes, Redcliffe	⊘	⊘	⊘
Metro South	PAH Heart Recovery Program	Princess Alexandra Hospital	⊘	⊘	⊘
	Bayside CR Program	Redland	⊘	⊘	⊘
	Brisbane South CR Service	Eight Mile Plains, Inala	⊘	⊘	⊘
	Logan-Beaudesert CR Service	Browns Plains	⊘	⊘	⊘
North West	North West CR Program	Mount Isa	⊘	⊘	⊘
South West	South West HHS CR Services	Charleville, Roma	⊘	⊘	⊘
		St George	⊘	⊘	⊘
Sunshine Coast	Sunshine Coast HHS Cardiac Rehab	Caloundra, Gympie, Maroochydore, Nambour, Noosa	⊘	⊘	⊘
Townsville	Townsville CR Outpatient Program	Townsville	⊘	⊘	⊘
	Ingham CR Outpatient Program	Ingham	○	○	◑
	Ayr Health Service	Ayr	◑	○	○
West Moreton	Ipswich and West Moreton CR	Ipswich, Boonah, Esk, Gatton, Laidley	⊘	⊘	⊘
Wide Bay	Fraser Coast CR	Hervey Bay, Maryborough	⊘	⊘	⊘
	Wide Bay Rural and Allied Health*	Biggenden, Eidsvold, Gayndah, Mundubbera	⊘	⊘	⊘

*   New service commencing in 2020

†   Health Contact Centre

‡   Self Management of Chronic Conditions (delivering the COACH program)

N/A Existing service ceased operations

Cardiac Rehabilitation
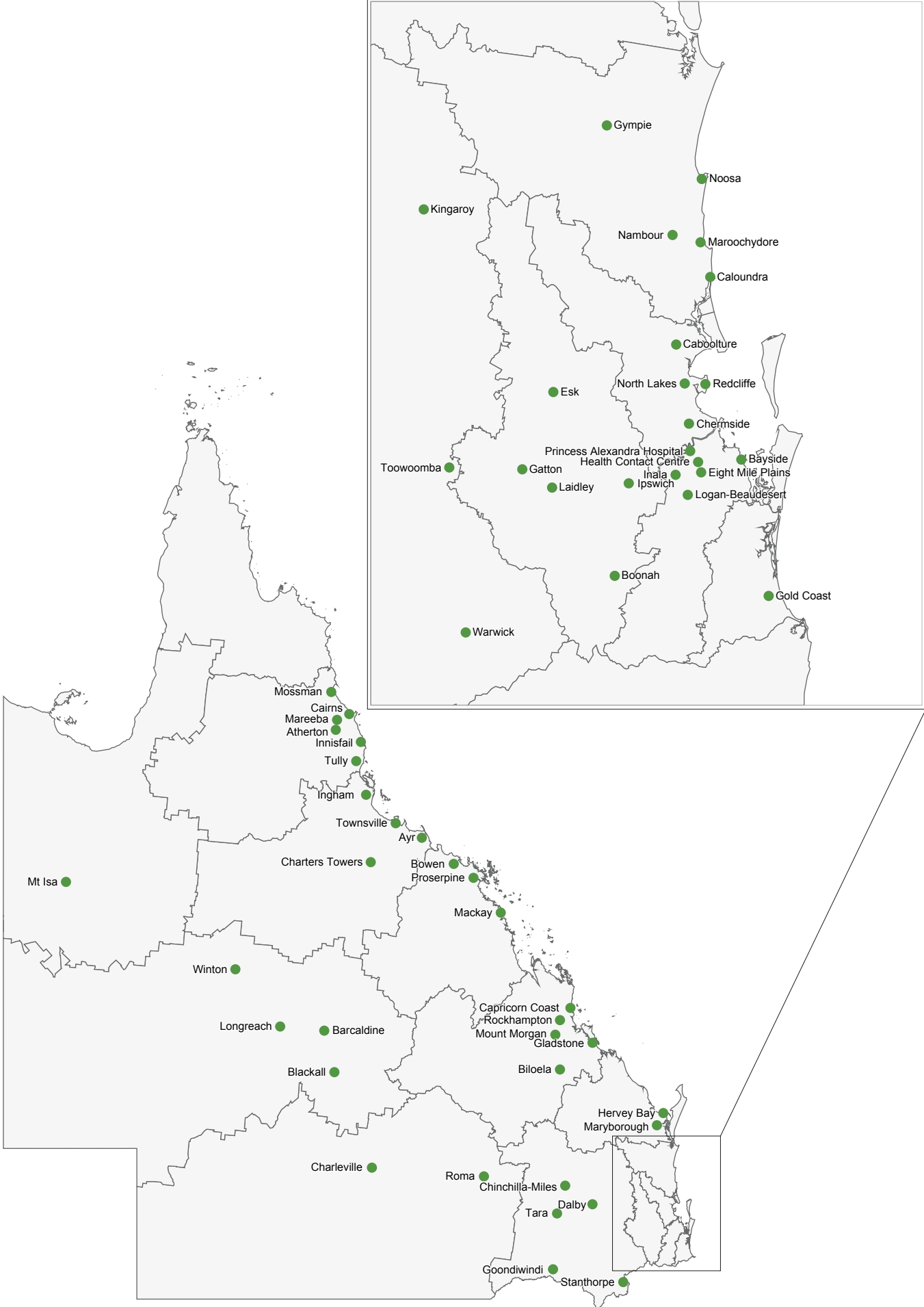
Figure 1:   Map of Queensland public CR sites

4 Total referrals

4.1 Statewide

The volume of cardiac rehabilitation (CR) referrals entered into the QCOR clinical application expanded through 2022 to include an additional 9,317 new referrals for the calendar year. This brings the overall total to over 60,000 referrals since data collection commenced in July 2017.

Clinicians at 59 Queensland CR sites have incorporated data entry into their daily practices. A smaller number of sites deliver public outpatient CR but contribute to the database inconsistently or not at all. This can be a result of various factors such as resource availability. These sites remain a focus for engagement and involvement.

There is now an increased level of detail that can be recorded in the QCOR module in cases where the patient declined a CR referral or was considered unsuitable to participate in CR during the acute inpatient period (phase 1). This has increased the availability of data, allowing these cases to be examined in more detail.
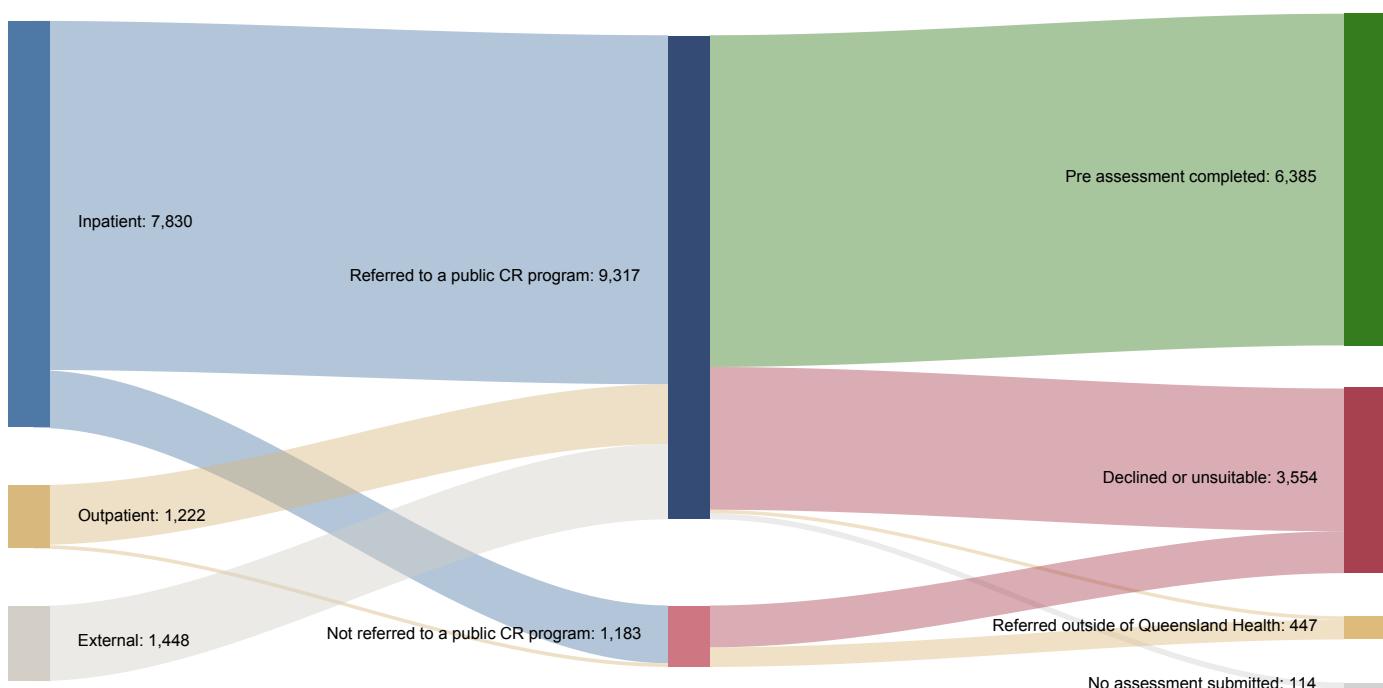
Figure 2:   Statewide cardiac rehabilitation referrals flow

Cardiac Rehabilitation

Patients were located across a wide geographical area with the majority residing in population centres along the Eastern Seaboard (Figure 3).

It is important to note that referrals for patients residing interstate or overseas are not generally accepted by Queensland public CR programs. The inclusion of these data is reflective of local site processes and may also vary based on available resources.
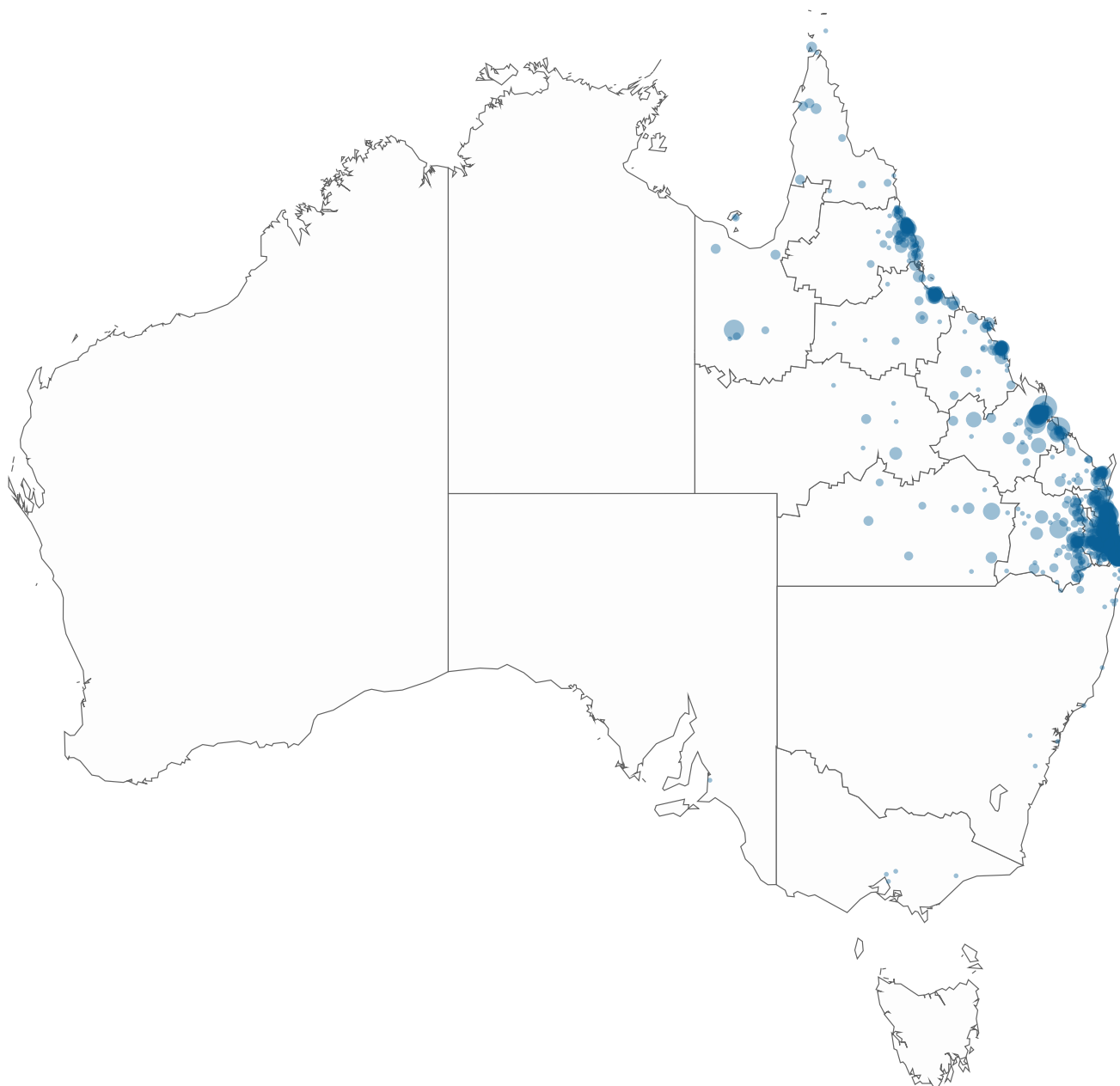
Figure 3: Distribution of CR referrals by usual place of residence

Table 2: Proportion of CR referrals by remoteness classification

Remoteness area*	%
Major Cities of Australia	54.0
Inner Regional Australia	27.2
Outer Regional Australia	15.3
Remote Australia	1.3
Very Remote Australia	2.2
ALL	**100.0**

Excludes missing data (0.2%)

* Classified by Australian Statistical Geography Standard remoteness area

4.2　Origin of referrals

The majority of referrals (72%) originated from an inpatient setting, with smaller proportions of referrals flowing to CR from an outpatient setting (12%) and outside of Queensland Health (16%).

There was considerable variation across participating CR programs in the proportion of referrals from external sources, which ranged from ‹1% to 31%. It is possible that not all sites are entering referrals received from general practitioners, private hospitals or external specialists, or that local access management strategies are in place where public referrals are prioritised entry into the program, or that local services are unaware that a CR program exists within the area.
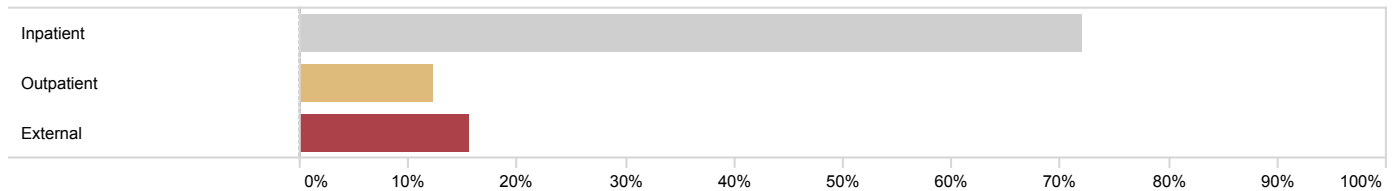
Figure 4:　Proportion of referrals by referral source

Table 3:　Referral sources by outpatient program HHS

HHS/division	Total referrals n	Inpatient* n (%)	Outpatient* n (%)	External n (%)
Cairns and Hinterland	639	545 (85.3)	39 (6.1)	55 (8.6)
Central Queensland	877	394 (44.9)	293 (33.4)	190 (21.7)
Central West	18	13 (72.2)	5 (27.8)	–
Darling Downs	415	272 (65.5)	61 (14.7)	82 (19.8)
Gold Coast	1,067	785 (73.6)	130 (12.2)	152 (14.2)
Health Contact Centre	1,268	1,113 (87.8)	108 (8.5)	47 (3.7)
Mackay	293	209 (71.3)	70 (23.9)	14 (4.8)
Metro North	1,290	840 (65.1)	188 (14.6)	262 (20.3)
Metro South	1,328	915 (68.9)	51 (3.8)	362 (27.3)
North West	52	33 (63.5)	17 (32.7)	2 (3.8)
South West	66	30 (45.5)	23 (34.8)	13 (19.7)
Sunshine Coast	843	743 (88.1)	45 (5.3)	55 (6.5)
Townsville	314	246 (78.3)	63 (20.1)	5 (1.6)
West Moreton	655	421 (64.3)	33 (5.0)	201 (30.7)
Wide Bay	192	160 (83.3)	25 (13.0)	7 (3.6)
Statewide	**9,317**	**6,719 (72.1)**	**1,151 (12.4)**	**1,445 (15.5)**

*　Includes referrals from a Queensland Health public facility

More than half of all patients were residing in major cities (54%), and the remainder in regional and remote areas of Queensland. This is consistent with the decentralised distribution of the population within the state.
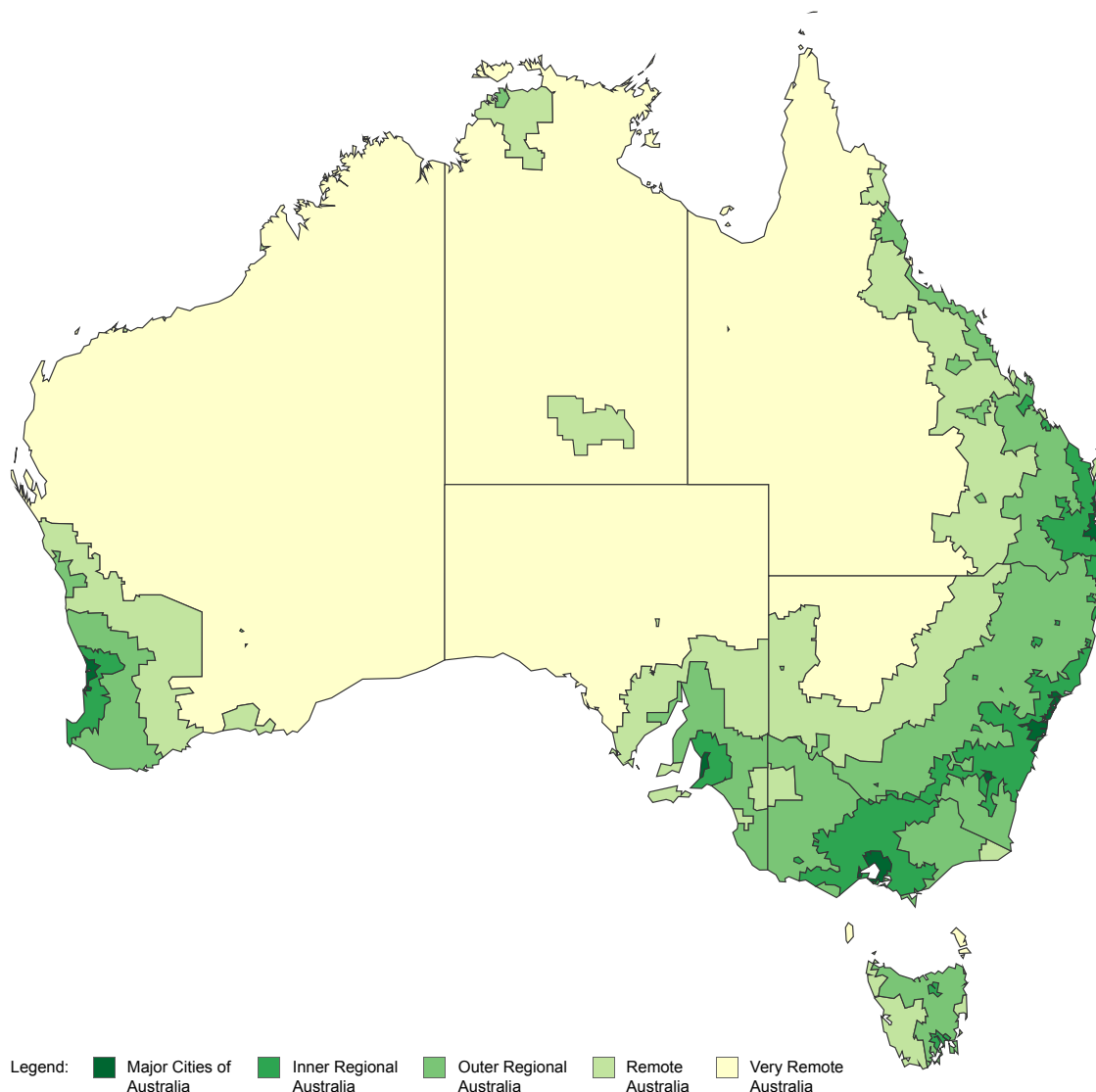
Figure 5:   Australian Statistical Geography Standard remoteness areas

Table 4:   CR referrals by outpatient HHS and patient remoteness classification

HHS/division	Major Cities n (%)	Inner Regional n (%)	Outer Regional n (%)	Remote n (%)	Very Remote n (%)
Cairns and Hinterland	2 (0.3)	2 (0.3)	560 (87.9)	25 (3.9)	48 (7.5)
Central Queensland	3 (0.3)	810 (92.5)	54 (6.2)	7 (0.8)	2 (0.2)
Central West	–	–	–	–	18 (100.0)
Darling Downs	2 (0.5)	318 (76.6)	92 (22.2)	2 (0.5)	1 (0.2)
Gold Coast	1,021 (96.1)	36 (3.4)	4 (0.4)	–	1 (0.1)
Health Contact Centre	668 (52.8)	267 (21.1)	234 (18.5)	43 (3.4)	52 (4.1)
Mackay	2 (0.7)	172 (58.7)	110 (37.5)	9 (3.1)	–
Metro North	1,153 (89.4)	132 (10.2)	2 (0.2)	–	3 (0.2)
Metro South	1,235 (93.3)	78 (5.9)	6 (0.5)	5 (0.4)	–
North West	–	–	1 (1.9)	3 (5.8)	48 (92.3)
South West	1 (1.5)	1 (1.5)	22 (33.3)	17 (25.8)	25 (37.9)
Sunshine Coast	489 (58.4)	342 (40.8)	7 (0.8)	–	–
Townsville	1 (0.3)	1 (0.3)	296 (94.3)	13 (4.1)	3 (1.0)
West Moreton	443 (67.6)	207 (31.6)	4 (0.6)	1 (0.2)	–
Wide Bay	1 (0.5)	162 (84.4)	29 (15.1)	–	–
Statewide	**5,021 (54.0)**	**2,528 (27.2)**	**1,421 (15.3)**	**125 (1.3)**	**201 (2.2)**

Cardiac Rehabilitation

4.3 Inpatient referrals

For referrals originating from an inpatient setting, the largest referrer was Metro North HHS which accounted for over one quarter (27%) of these referrals. The largest proportion of inpatient referrals was received by the Health Contact Centre (17%). The higher volumes of referrals to the Health Contact Centre is likely a result of model of care changes during the COVID-19 pandemic.

Table 5:   CR inpatient referrals by source and destination HHS

HHS/organisation	Outgoing inpatient referrals n (%)	Incoming inpatient referrals n (%)
Cairns and Hinterland	517 (7.7)	545 (8.1)
Central Queensland	238 (3.5)	394 (5.9)
Central West	–	13 (0.2)
Darling Downs	84 (1.2)	272 (4.0)
Gold Coast	784 (11.7)	785 (11.7)
Health Contact Centre	–	1,113 (16.6)
Mackay	163 (2.4)	209 (3.1)
Mater Health Services	84 (1.2)	–
Metro North	1,816 (27.0)	840 (12.5)
Metro South	1,752 (26.1)	915 (13.6)
North West	1 (<0.1)	33 (0.5)
South West	–	30 (0.4)
Sunshine Coast	640 (9.5)	743 (11.1)
Townsville	509 (7.6)	246 (3.7)
West Moreton	128 (1.9)	421 (6.3)
Wide Bay	3 (<0.1)	160 (2.4)
Statewide	**6,719 (100.0)**	**6,719 (100.0)**

Cardiac Rehabilitation

The flow of inpatient referrals from the originating HHS or organisation (acute site) to the CR outpatient program HHS is illustrated in Figure 6. The majority of inpatient referrals remained within the originating HHS, though there was some variation noted.

It should be highlighted that there are no outpatient programs for Mater Health Services, and conversely the Health Contact Centre provides an outpatient (telephone based) service only.

Cardiac Rehabilitation

Source		Destination	
Cairns and Hinterland: 517		Cairns and Hinterland: 545	
Central Queensland: 238		Central Queensland: 394	
Darling Downs: 84		Central West: 13	
Gold Coast: 784		Darling Downs: 272	
Mackay: 163		Gold Coast: 785	
Mater Health Services: 84		Health Contact Centre: 1,113	
Metro North: 1,816		Mackay: 209	
Metro South: 1,752		Metro North: 840	
North West: 1		Metro South: 915	
Sunshine Coast: 640		North West: 33	
Townsville: 509		South West: 30	
West Moreton: 128		Sunshine Coast: 743	
Wide Bay: 3		Townsville: 246	
		West Moreton: 421	
		Wide Bay: 160	

Figure 6:   CR inpatient referrals by source and destination HHS

5   Program participation

5.1   Pre assessment stage

The assessment of a patient attending CR comprises a comprehensive cardiovascular disease risk factor review. This extends beyond a patient's presenting medical and social history to encompass overall health, physical well-being, psychological factors, availability of social support and patient-reported quality of life.

An assessment within outpatient CR is generally conducted in two stages which occur before and after a patient attends the specialist CR program. These stages are referred to as the pre assessment and post assessment. The pre assessment signifies the successful enlistment of a patient onto the CR program. Assessments may be undertaken via telehealth or face-to-face.

The proportion of total referrals which proceeded to a pre assessment within any timeframe was 69%. This is a limited metric which should be interpreted with caution due to varying processes across the state for patients refusing or not interested in attending CR, and for patients residing overseas and interstate.

Capacity for service delivery is also a contributing factor for referrals not proceeding to pre assessment, these issues are explored later in the report.

Table 6:   Total pre assessments completed by outpatient HHS/division

Outpatient HHS/division	Pre assessment completed n (%)	Declined/not assessed n (%)	No assessment submitted n (%)
Cairns and Hinterland	469 (73.4)	170 (26.6)	–
Central Queensland	604 (68.9)	273 (31.1)	–
Central West	12 (66.7)	6 (33.3)	–
Darling Downs	272 (65.5)	129 (31.1)	14 (3.4)
Gold Coast	813 (76.2)	254 (23.8)	–
Health Contact Centre	863 (68.1)	405 (31.9)	–
Mackay	197 (67.2)	96 (32.8)	–
Metro North	886 (68.7)	404 (31.3)	–
Metro South	911 (68.6)	416 (31.3)	1 (0.1)
North West	46 (88.5)	4 (7.7)	2 (3.8)
South West	57 (86.4)	6 (9.1)	3 (4.5)
Sunshine Coast	511 (60.6)	332 (39.4)	–
Townsville	160 (51.0)	108 (34.4)	46 (14.6)
West Moreton	433 (66.1)	174 (26.6)	48 (7.3)
Wide Bay	151 (78.6)	41 (21.4)	–
Statewide	**6,385 (68.5)**	**2,818 (30.2)**	**114 (1.2)**

Cardiac Rehabilitation
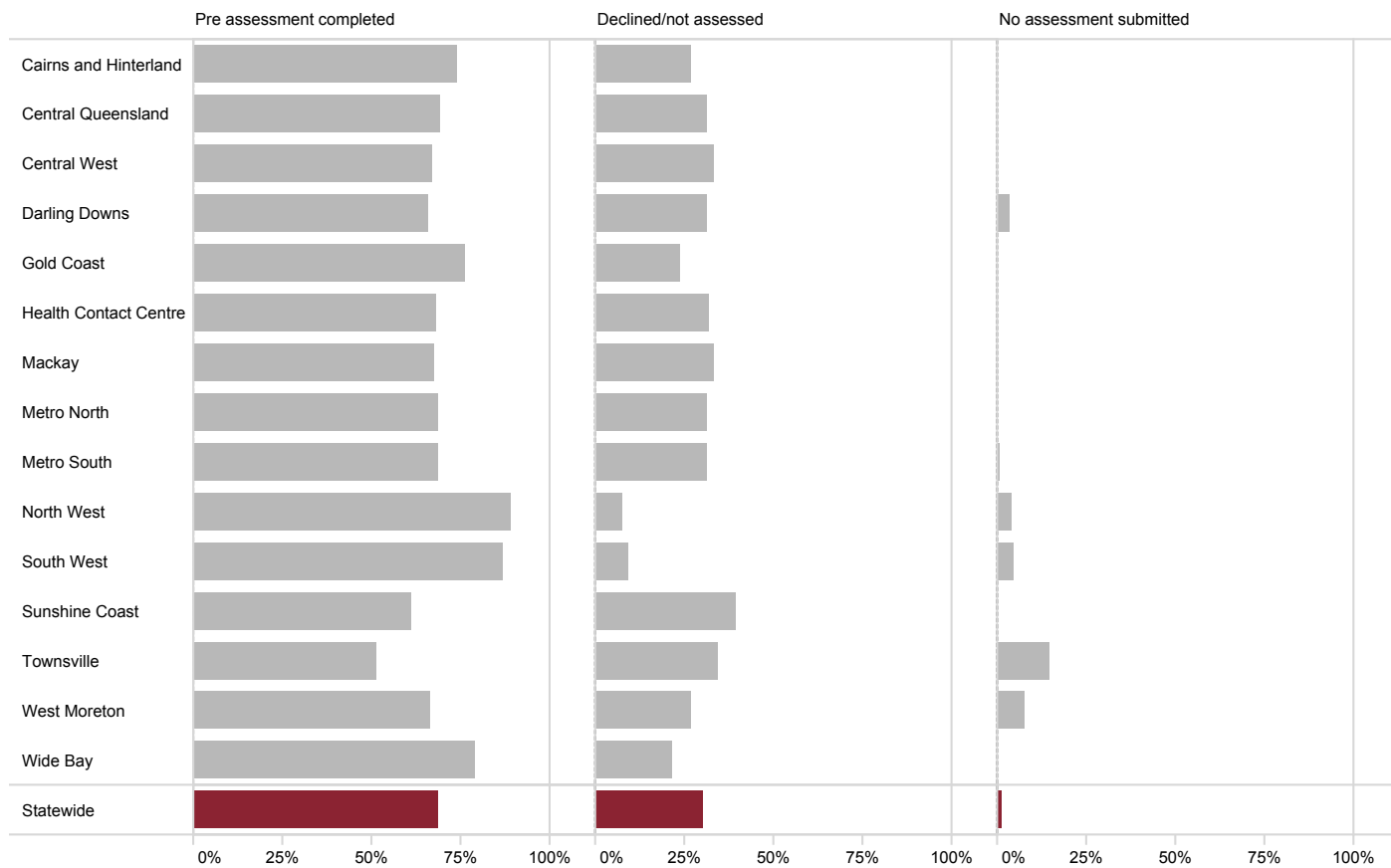
Figure 7:   Proportion of CR referrals proceeding to pre assessment by outpatient HHS/division

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5.2 Post assessment stage

In most cases, the post assessment is representative of completion and graduation from the specialist CR outpatient program. This provides an opportunity for the patient and clinician to reflect upon the targets defined at the pre assessment and discuss the impact of the program. Of 6,385 completed pre assessments, almost half (48%) proceeded to post assessment which is an improvement over the three previous years where 41% progressed.

Completion rates and median time interval from pre assessment to post assessment varied considerably by HHS. The median time from pre assessment to post assessment was 82 days, with a range of 55 days to 142 days across outpatient HHS. There was considerable variation in the proportion of cases where a post assessment was completed, suggesting the model of care and data entry vary at a local level. A range of issues can contribute to completion of the post assessment which may include timing, patient availability or other factors outside the control of the program. In 2023, additional fields related to cardiac rehabilitation model of care have been added to the QCOR module, to provide additional information in future reports.

Data reported in this section uses a six month cut-off period for post assessment completion.

Table 7:   Total post assessments completed by HHS

Outpatient HHS/division	Post assessment completed n (%)	Median time to post assessment days
Cairns and Hinterland	171 (36.5)	62
Central Queensland	330 (54.6)	81
Central West	3 (25.0)	N/A
Darling Downs	166 (61.0)	63
Gold Coast	351 (43.2)	59
Health Contact Centre	625 (72.4)	142
Mackay	76 (38.6)	84
Metro North	398 (44.9)	87
Metro South	386 (42.4)	70
North West	2 (4.3)	N/A
South West	23 (40.4)	101
Sunshine Coast	116 (22.7)	89
Townsville	85 (53.1)	71
West Moreton	300 (69.3)	55
Wide Bay	57 (37.7)	57
Statewide	**3,089 (48.4)**	**82**

N/A: Not displayed due to <20 post assessments for analysis
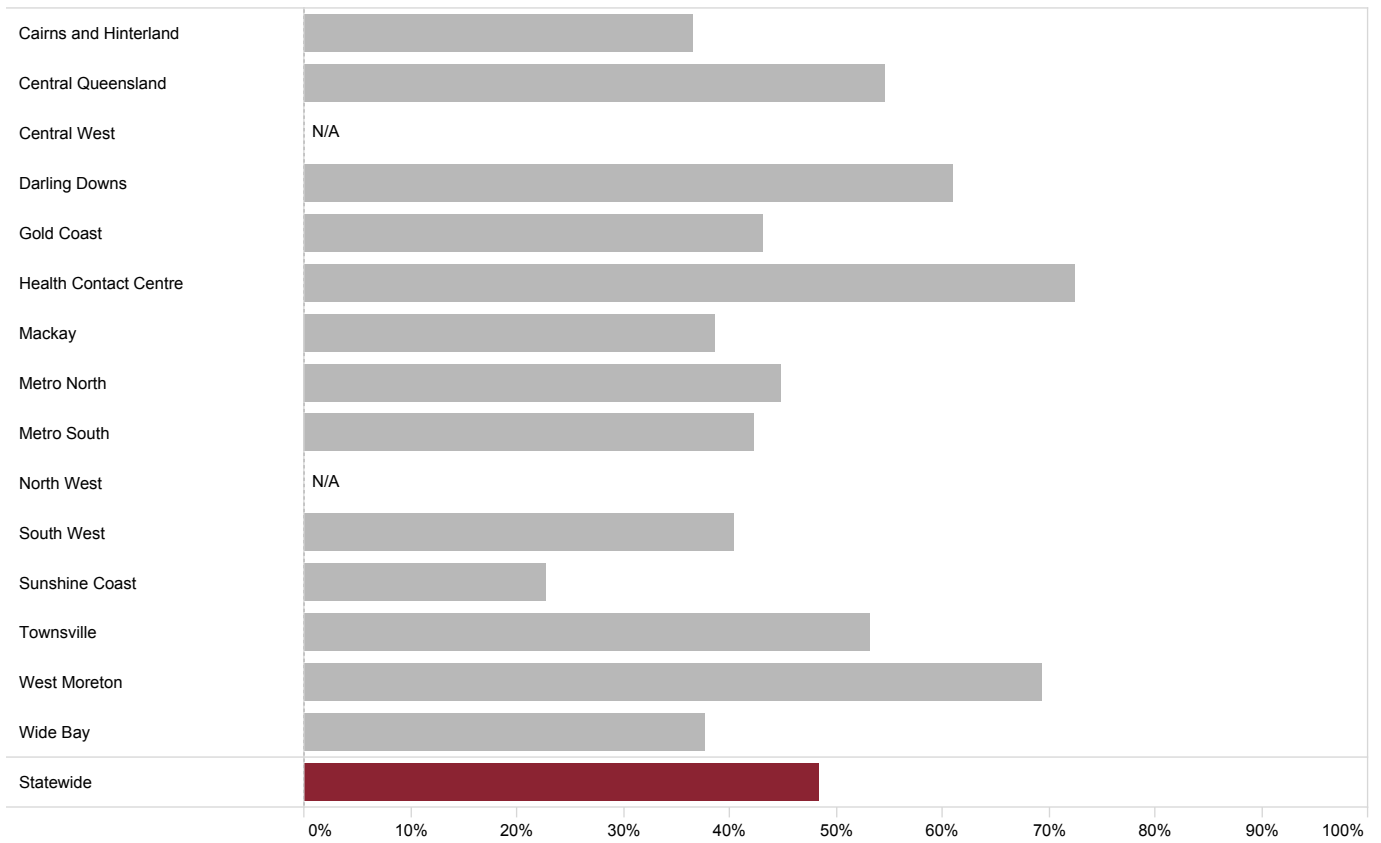
N/A: Not displayed due to ‹20 post assessments for analysis

Figure 8:   Proportion of CR assessments proceeding to post assessment

6   Patient characteristics

The following analysis examines the characteristics of the 9,317 patients who were referred to a public CR program. Largely these characteristics are similar to those reported over previous years.

6.1   Age and gender

Development of cardiovascular disease is related to age. Overall, 70% of patients were male and 30% female. The age distribution of referrals was similar for genders, though the median age for males was slightly lower than for females (66 years vs. 68 years).

Overall, three quarters of patients were 57 years of age or older (interquartile range 57 years to 74 years).

These characteristics are similar to those observed in previous years.
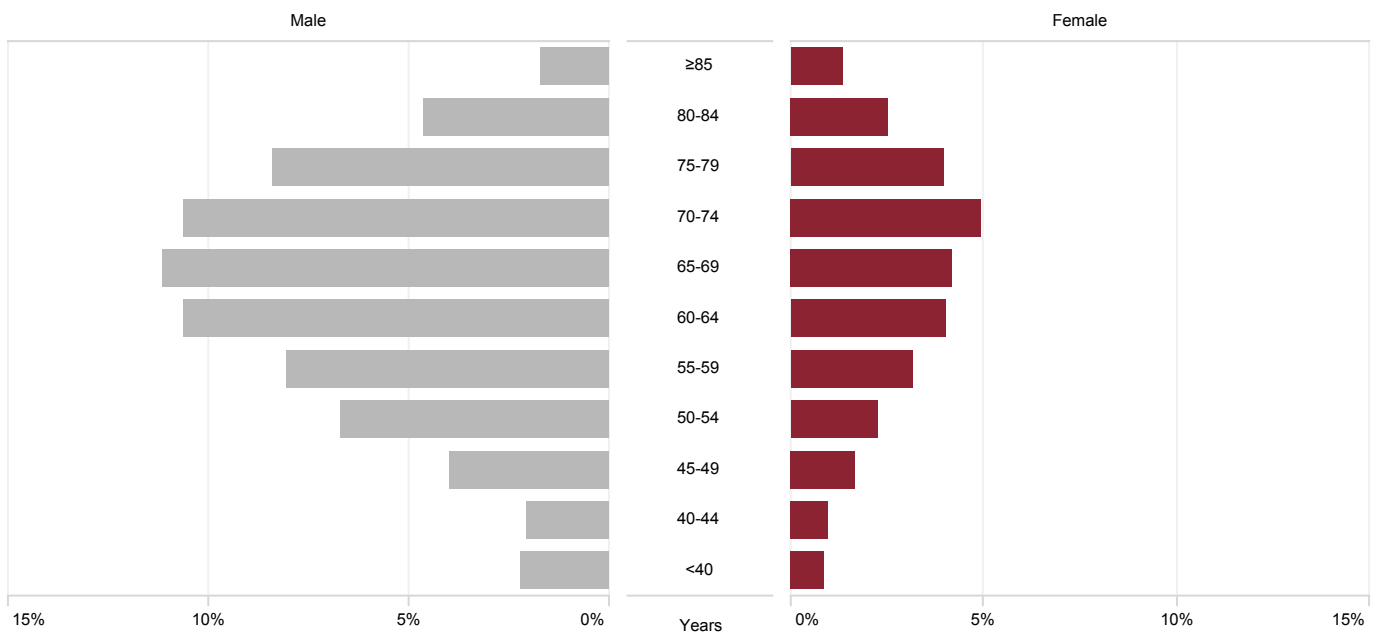
% of total referrals (n=9,317)

Figure 9:   Referrals by patient gender and age group

Table 8:   Median patient age by gender and HHS

Outpatient HHS/division	Male years	Female years	ALL years
Cairns and Hinterland	64	65	65
Central Queensland	68	67	68
Central West	65	78	75
Darling Downs	64	67	66
Gold Coast	70	66	67
Health Contact Centre	68	64	65
Mackay	66	65	65
Metro North	69	67	68
Metro South	67	65	65
North West	57	59	59
South West	70	62	63
Sunshine Coast	68	68	68
Townsville	64	63	63
West Moreton	66	65	65
Wide Bay	66	69	68
Statewide	**68**	**66**	**66**

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6.2   Aboriginal and Torres Strait Islander status

It is recognised that the Aboriginal and Torres Strait Islander population has a higher incidence and prevalence of coronary artery disease with ischaemic heart disease identified as the leading cause of death among Indigenous Australians in 2020.[1]

In this cohort, Aboriginal and Torres Strait Islander patients represent 6.4% of all statewide referrals with considerable variation observed across CR programs. By comparison, the estimated overall proportion of the Aboriginal and Torres Strait Islander population in Queensland is 4.6%.[2]
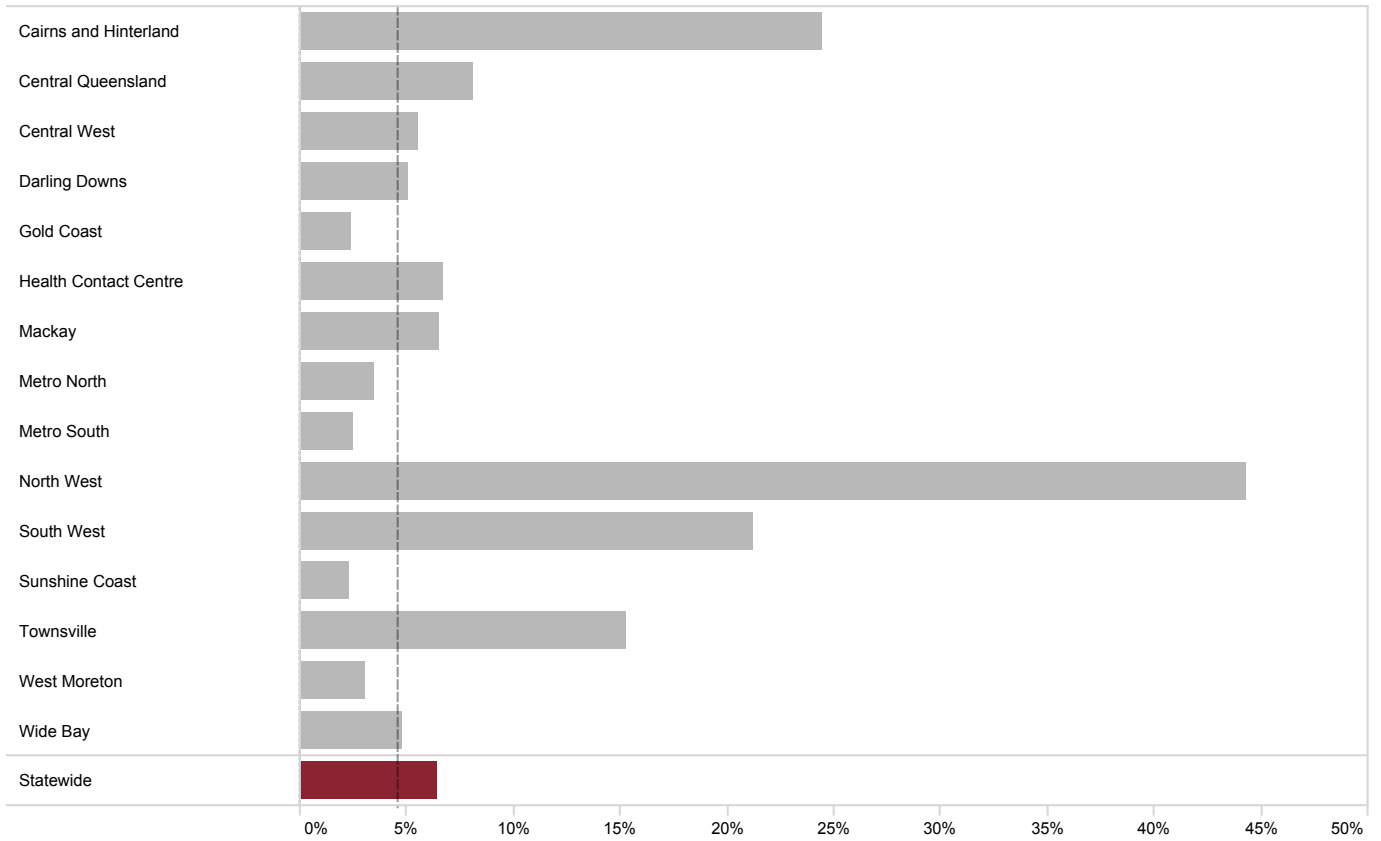
Excludes missing data (4.7%)

Figure 10: Proportion of identified Aboriginal and Torres Strait Islander patients by outpatient HHS

The proportion of Aboriginal and Torres Strait Islander patients referred to CR had a median age considerably lower than other patients (56 years vs. 67 years respectively).

The rate of cardiovascular disease among Aboriginal and Torres Strait Islander patients is largely different to that seen among other Australians. The disparity in median age and proportionate numbers of Aboriginal and Torres Strait Islander patients undertaking CR is consistent with chronic diseases occurring more often and at a younger age compared to non-Indigenous Australians.
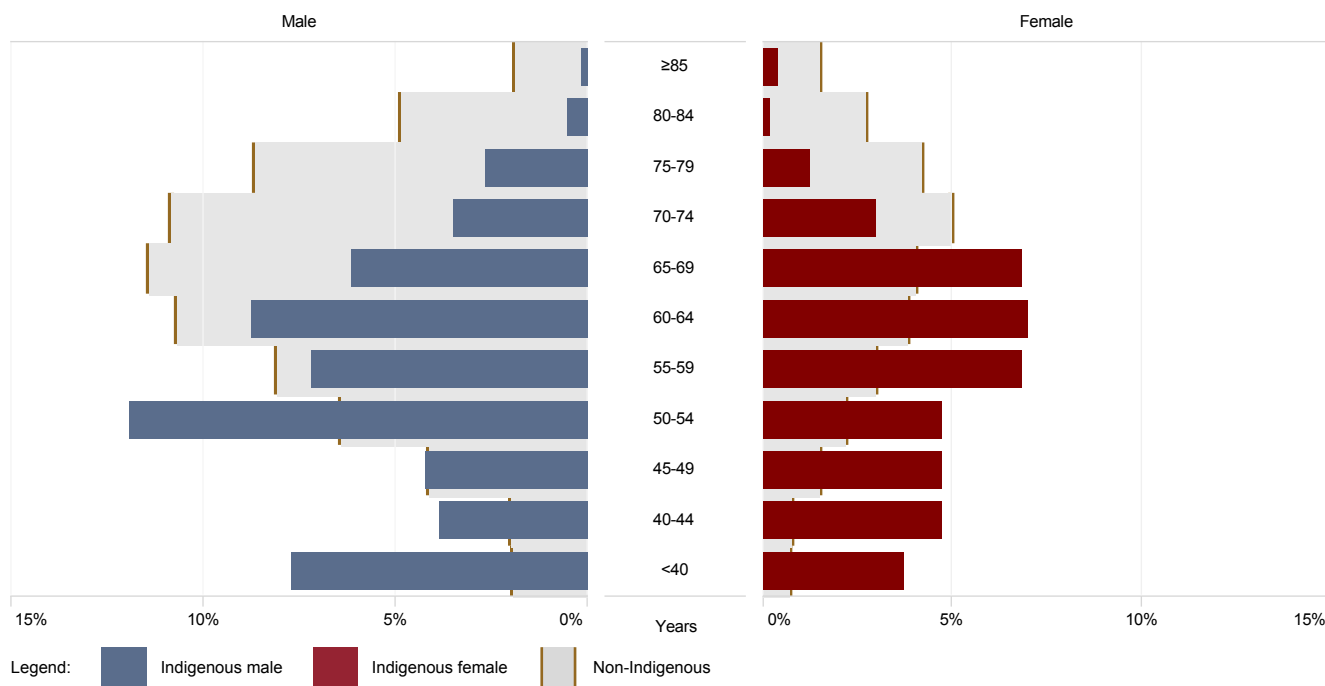
Excludes missing data (4.1%)

Figure 11:   Proportion of all CR referrals by age group and Indigenous status

Table 9:   Median patient age by gender and Indigenous status

	Male years	Female years	ALL years
Aboriginal and Torres Strait Islander	56	58	56
Non Aboriginal and Torres Strait Islander	66	68	67
ALL	**66**	**67**	**66**

Excludes missing data 4.7%

7 Clinical presentation

7.1 Diagnosis

For the following analysis, patients attending a CR pre assessment have been grouped into a diagnosis category based on clinical patient information obtained through the course of referral and pre assessment.

The majority of pre assessments (68%) followed a previous diagnosis of ischaemic heart disease (IHD).

Table 10: Pre assessments by diagnosis category

Diagnosis category	n	%
Ischaemic heart disease*	4,332	67.9
Valvular disease	576	9.0
Other†	1,477	23.1
ALL	**6,385**	**100.0**

*   STEMI, NSTEMI and angina

†   Typically includes arrhythmia, congestive heart failure and any other diagnosis

7.2 Most recent procedure

The most common procedure preceding a referral to CR was PCI. This was documented for 44% of all referrals and 58% of referrals for patients with IHD.

There were 12% of cases where the most recent procedure had not been identified. These cases can be attributed to missing data, or to patients being conservatively managed and thus having no previous invasive cardiac procedure at the time of program commencement.

Table 11: Most recent procedure noted at pre assessment by diagnosis category

Most recent procedure	Ischaemic heart disease n (%)	Valvular disease n (%)	Other n (%)	ALL n (%)
PCI	2,515 (58.1)	5 (0.9)	311 (21.1)	2,831 (44.3)
Coronary angiogram	692 (16.0)	16 (2.8)	202 (13.7)	910 (14.3)
CABG	718 (16.6)	13 (2.3)	216 (14.6)	947 (14.8)
Valve procedure	7 (0.2)	464 (80.6)	97 (6.6)	568 (8.9)
Device procedure	11 (0.3)	2 (0.3)	93 (6.3)	106 (1.7)
CABG + valve procedure	54 (1.2)	52 (9.0)	23 (1.6)	129 (2.0)
Other	22 (0.5)	9 (1.6)	131 (8.9)	162 (2.5)
Not specified	313 (7.2)	15 (2.6)	404 (27.4)	732 (11.5)

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7.3   Risk factors and comorbidities

The following risk factors and comorbidities are discussed with the patient through the assessment phase and are generally self reported by the patient. With all self reporting instances, it is important to note that sometimes responses are not accurately conveyed while the patient and clinician are in the establishment phase of their relationship. As a result, some of the risk factor metrics may be understated.

At the time of the pre assessment:

- The majority of patients (91%) had a history of abnormal cholesterol levels or had been prescribed lipid lowering therapy at the time of assessment. This ranged from 66% to 97% across diagnosis categories.

- Only 35% of patients met the physical activity guidelines for their age and were sufficiently active. Furthermore, 20% of patients were classed as inactive, which is defined as only undertaking activities associated with daily living.

- The majority of patients were identified as having an unhealthy body mass index (BMI) with just over one fifth (21%) of patients having a BMI within the normal range.

- Overall, 27% of patients had diabetes as a comorbidity with some variation observed between diagnosis categories.

- Almost half (46%) of patients had a family history of cardiovascular disease.

- Overall, there were 18% of patients assessed by outpatient CR who were documented as having heart failure.

- Of the patients documented to have heart failure, 88% were classed as having a reduced ejection fraction (LVEF <50%).

- Over one quarter (29%) of patients had a documented history of depression.

- More than half of patients (60%) were identified as having a history of hypertension.

- There were 13% of patients identified as current smokers (defined as smoking within 30 days), while 46% were classed as former smokers. Patients with ischaemic heart disease were those with the highest rate of current smoking.

Table 12: Summary of risk factors by diagnosis category

Risk factor	Ischaemic heart disease %	Valvular disease %	Other %	ALL %
Abnormal cholesterol*	97.3	66.0	82.7	91.1
Activity level				
Sufficiently active	36.9	36.1	28.8	34.8
Insufficiently active	43.3	46.8	49.9	45.3
Inactive	19.7	17.2	21.3	19.9
Body mass index				
Normal range†	20.8	24.6	18.9	20.7
Overweight‡	38.4	34.5	34.2	37.1
Obese§	35.0	35.7	38.3	35.8
Morbidly obese‖	4.8	4.1	7.6	5.4
Diabetes	28.4	16.1	26.8	26.9
Family history of CVD#	47.8	32.9	44.2	45.6
Heart failure	14.6	13.0	30.9	18.2
Heart failure, LVEF**				
≥50%	5.9	28.8	17.2	11.7
40–49%	42.0	34.3	26.2	35.4
30–39%	39.1	24.7	33.2	35.8
‹30%	13.1	12.3	23.4	17.0
History of depression	28.4	26.9	30.9	28.9
Hypertension	59.4	55.4	62.5	59.7
Smoking status				
Current smoker††	15.7	3.3	9.9	13.2
Former smoker	46.5	46.9	46.0	46.4
Never smoked	37.8	49.8	44.1	40.3

% from total complete data per case category

*   Total cholesterol ›4.0 mmol/L, HDL ‹1.0 mmol/L, LDL ›2.0 mmol/L or triglycerides ›2.0 mmol/L

†   BMI 18.5–24.9 kg/m²

‡   BMI 25.0–29.9 kg/m²

§   BMI 30.0–39.9 kg/m²

‖   BMI ≥40.0 kg/m²

Cardiovascular disease

**   Left ventricular ejection fraction

††   Within 30 days

7.4   Current medications

Over three quarters of patients were being treated with aspirin (83%) and lipid lowering medications (86%). As expected, there was variation in medication across diagnosis categories. Patients with IHD tended to use antiplatelet and sublingual nitrate medications more than patients with valvular disease. This is consistent with the different disease processes and respective treatment regimes.

Although these measures are not directly influenced by CR practitioners, these data are important to note for the overall care and treatment of cardiac disease.

Table 13:   Current medications by diagnosis category

Medications	IHD %	Valvular disease %	Other %	ALL %
Aspirin	90.9	65.2	65.3	82.7
ACEI/ARB*	66.9	40.2	55.0	61.8
Antiplatelet	73.1	13.2	35.7	59.1
Anticoagulant	14.4	45.6	29.1	20.6
Beta blocker	68.7	54.6	64.4	66.4
Diabetic medications	25.3	14.3	24.4	24.1
Dual antiplatelet	68.1	7.8	28.0	53.4
Lipid lowering	92.9	58.1	75.6	85.8
Sublingual nitrate	60.6	4.5	24.8	47.3
Other	67.8	83.5	77.0	71.3

* Angiotensin converting enzyme inhibitor/angiotensin receptor blocker

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8   Program outcomes

The following outcome measures use paired observations from the pre assessment and post assessment stages to identify changes in health status for patients participating in CR. Measures included in this analysis relate to patient reported outcome measures (PROMS) and other functional or pathological investigations.

A limiting factor for this analysis is availability of data for the post assessment stage. Specifically, the availability of updated pathology and other investigations as well as the model of care employed by the CR program. This may result in limited data from which conclusions can be drawn and is a focus for future reporting and enhancements to data collection.

Table 14:   Summary of program outcome measures

Program outcome	Category	Measure
1	Pathology	Lipid profile
2	Functional	Six minute walk test
3	PROMS	Patient Health Questionnaire
4	PROMS	Assessment of Quality of Life
5	PROMS	Other patient reported quality of life
6	PROMS	Other patient reported outcomes

8.1   Lipid profile

Data for lipid values such as total cholesterol was available for a smaller proportion of patients completing CR. A barrier to reporting this outcome is that updated pathology results are not always available for the post assessment stage. It is hoped that this limitation may be reduced with increased availability of data and linkage with other Queensland Health data collections.

Overall a reduction in the mean total cholesterol was observed as was a reduction in triglycerides and LDL-C levels. This may be attributable to the impact of CR and adherence with pharmacotherapy.

Table 15:   Summary of lipid values

	Total analysed n	Pre assessment Mean ± SD	Post assessment Mean ± SD	Change in value Mean ± SD
Total cholesterol (mmol/L)	444	4.6 ± 1.4	3.4 ± 0.9	-1.2 ± 1.4
Triglycerides (mmol/L)	409	1.8 ± 1.2	1.5 ± 0.8	-0.3 ± 1.1
HDL-C (mmol/L)	368	1.1 ± 0.5	1.1 ± 0.5	0.0 ± 0.6
LDL-C (mmol/L)	356	2.7 ± 1.2	1.7 ± 0.7	-1.1 ± 1.2

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8.2   Six minute walk test

A functional measure is commonly utilised prior to implementing an exercise program in order to determine exercise prescription and enable changes to be measured. The six minute walk test (6MWT) is a standardised investigation of submaximal exercise capacity that is often used in patients with cardiopulmonary disease. Changes in the six minute walk distance are useful in assessing functional capacity and the efficacy of therapeutic interventions such as pharmacotherapy and CR.[51]

There were 1,393 cases where the patient completed a 6MWT at the pre assessment and post assessment stages. The 6MWT is not always feasible due to the different models of care that exist, with some programs not offering an exercise component. The majority of patients (76%) had a clinically significant improvement in 6MWT distance of greater than 25 metres with 56% recording an increase of greater than 50 metres (Table 17).

Legend: ▮ Pre assessment (n)   ▮ Post assessment (n) | Median   ┆ Interquartile range
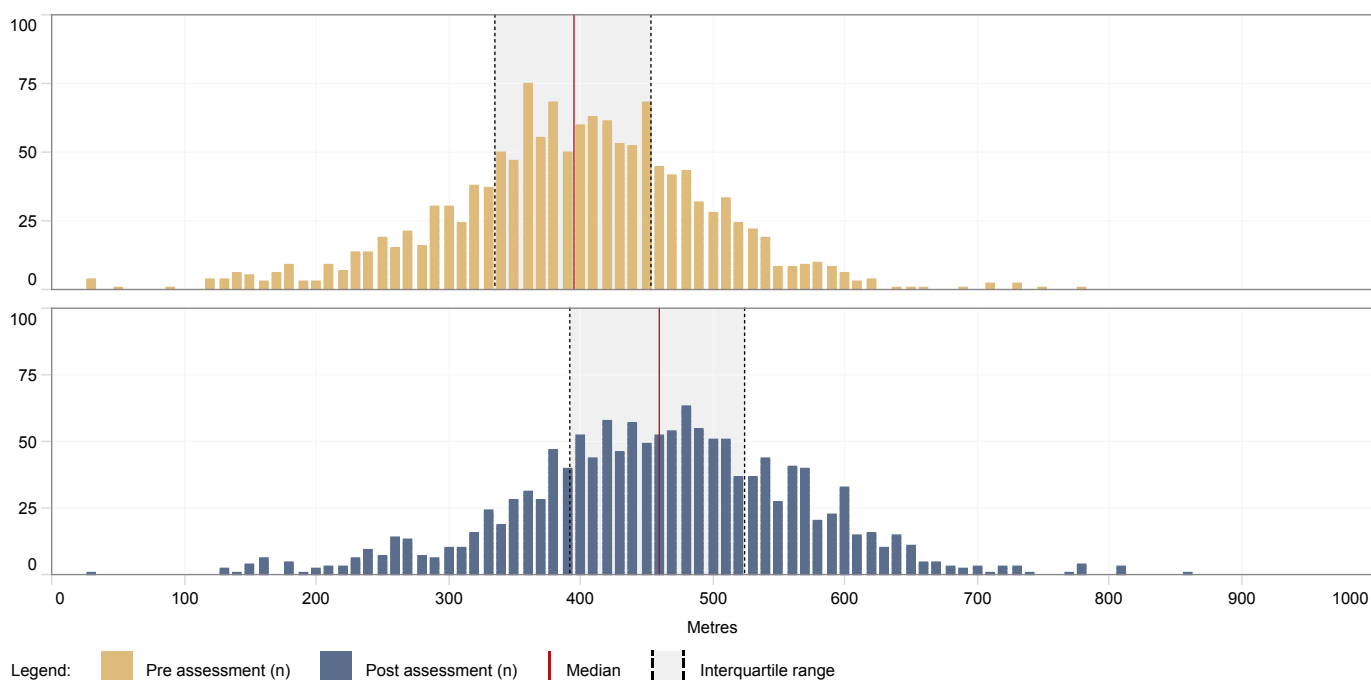
Results rounded to 10 metres

Figure 12: Comparison of pre assessment and post assessment six minute walk test results

Table 16:   Summary of six minute walk test results

	Total analysed n	Pre assessment Mean ± SD	Post assessment Mean ± SD	Change in value Mean ± SD
Distance travelled (metres)	1,393	391.1 ± 100.2	452.5 ± 116.0	61.4 ± 73.3

Table 17:   Change in six minute walk test results

	n (%)
Improved ≥50 metres	779 (55.9)
Improved 26–49 metres	285 (20.5)
No change (±25 metres)	281 (20.2)
Worsened >25 metres	48 (3.4)
ALL	**1,393 (100.0)**

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8.3   Patient reported outcome measures

Patient Health Questionnaire

The CR assessment often includes a brief screening for anxiety and depressive disorders. Both of these are significant risk factors for patients suffering coronary artery disease and are associated with adverse cardiovascular outcomes independent of other risk factors.

The Patient Health Questionnaire-4 (PHQ-4) is a validated tool for screening anxiety and depressive disorders. [52] This instrument is a four item composite measure derived from the Generalised Anxiety Disorder-7 scale (GAD-7) and the Patient Health Questionnaire-9 (PHQ-9). Each of the four items on the PHQ-4 is scored using a four point scale:

- high psychological distress being scored 9–12 points

- mild psychological distress scoring between 3–5 points

- minimal depression and anxiety scoring between 0–2 points.

A total of 2,179 paired data were available for analysis. One third of patients (33%) demonstrated an improved PHQ-4 score at post assessment while 52% recorded no change to their PHQ-4 score. Given a large proportion of patients reported minimal depression and anxiety at the pre assessment there is often no scope for improvement via this metric.
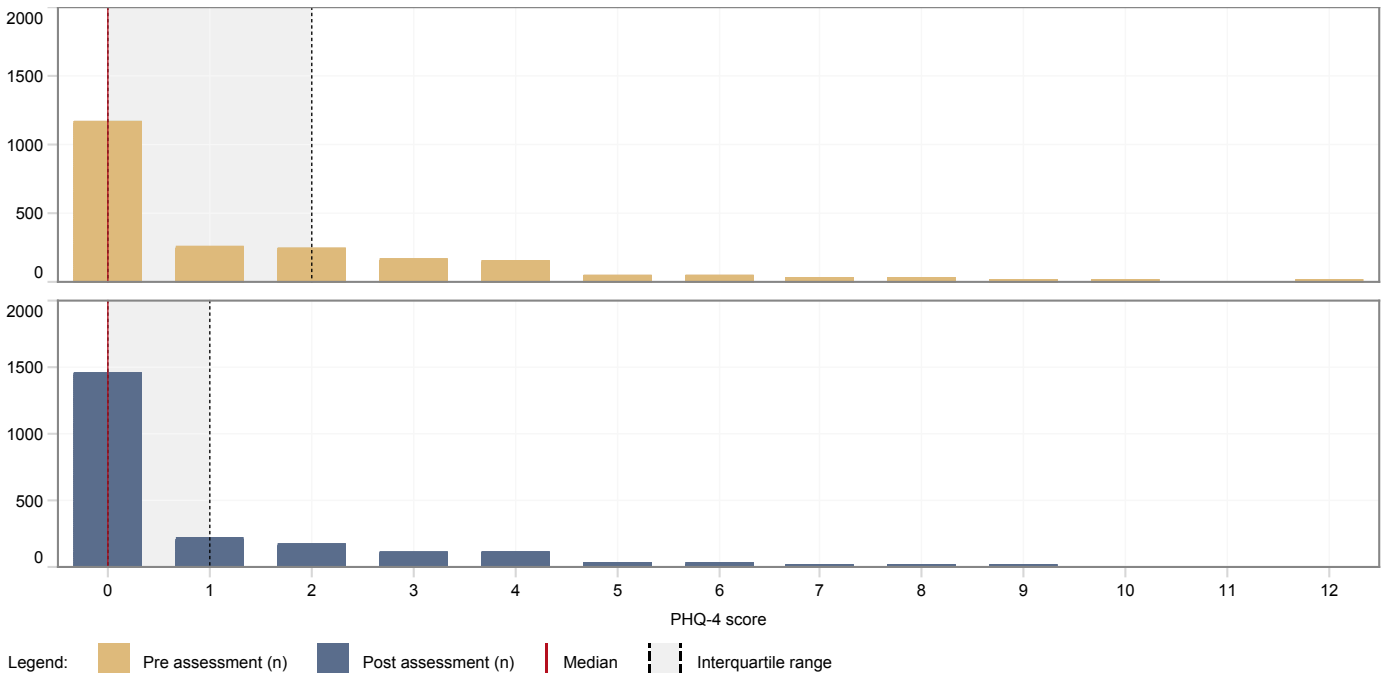
Figure 13: Comparison of pre assessment and post assessment PHQ-4 results

Table 18:   Summary of PHQ-4 results

	Total analysed n	Pre assessment Mean ± SD	Post assessment Mean ± SD	Change in value Mean ± SD
Depression score (PHQ-2)	2179	0.7 ± 1.2	0.4 ± 1.0	-0.2 ± 1.2
Anxiety score (GAD-2)	2,179	0.8 ± 1.3	0.6 ± 1.1	-0.3 ± 1.3
Overall score	**2,179**	**1.5 ± 2.2**	**1.0 ± 1.9**	**-0.5 ± 2.1**

Table 19:   Change in PHQ-4 results

	n (%)
Any improvement	725 (33.3)
No change	1,131 (51.9)
Any worse result	323 (14.8)
ALL	**2,179 (100.0)**

Assessment of Quality of Life

The Assessment of Quality of Life (AQoL-4D) is a multi-attribute utility instrument developed to assess health related quality of life. It measures PROMS across four domains of health, scored individually, as well as providing an overall score. Overall AQoL-4D utility score ranges from 0.00–1.00, with scores closer to 1.00 indicating higher satisfaction of patients reporting the status of their own health.

For the 1,135 records available at the pre and post CR timeframes, the mean overall pre assessment AQoL-4D utility score was 0.71 which compares similarly to expected results for patients with a cardiovascular diagnosis.[53] This utility score improved to 0.77 at the post assessment stage, where 60% of patients demonstrated an improved overall utility score after CR intervention (Table 20 and Table 21).

Legend: ▮ Pre assessment (n) ▮ Post assessment (n) ▮ Median ⁝ Interquartile range
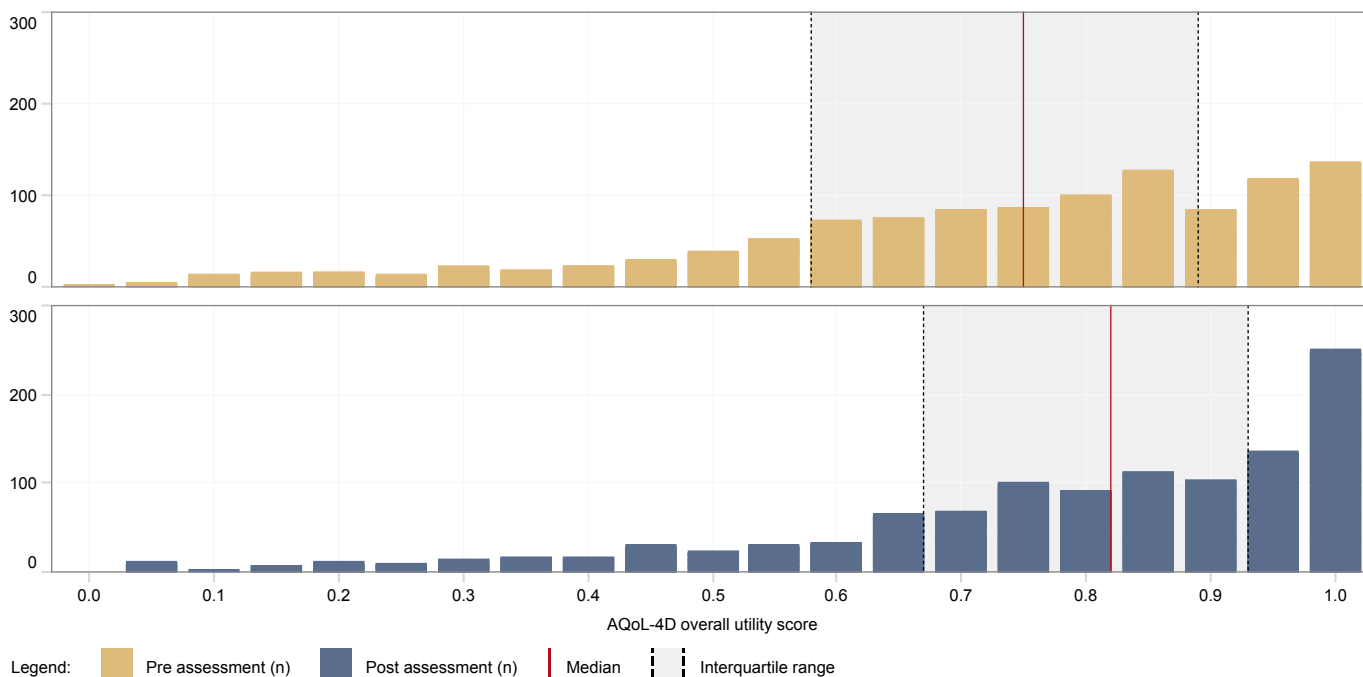
Results rounded to 0.05 utility score

Figure 14: Comparison of pre assessment and post assessment AQoL-4D results

Table 20: Summary of AQoL-4D results

	Total analysed n	Pre assessment Mean ± SD	Post assessment Mean ± SD	Change in value Mean ± SD
Independent living	1,135	0.88 ± 0.19	0.94 ± 0.13	0.06 ± 0.17
Relationships	1,135	0.91 ± 0.15	0.92 ± 0.15	0.01 ± 0.14
Senses	1,135	0.94 ± 0.08	0.94 ± 0.09	‹0.01 ± 0.08
Mental health	1,135	0.90 ± 0.11	0.91 ± 0.11	0.01 ± 0.11
Overall score	**1,135**	**0.71 ± 0.23**	**0.77 ± 0.22**	**0.06 ± 0.21**

Table 21: Change in AQoL-4D results

	n (%)
Any improvement	685 (60.4)
No change	117 (10.3)
Any worse result	333 (29.3)
ALL	**1,135 (100.0)**

Other patient reported quality of life

Any assessment by a CR clinician includes a component assessing for quality of life (QOL). However, the use of a long-form questionnaire (such as AQoL-4D) is often impractical or unwarranted. The assessment of patient reported QOL takes the form of an abbreviated questionnaire allowing patients to self-report their health-related status across three domains.

The questions asked include:

• In general, how would you describe your health at present?

• In general, how would you describe your mood at present?

• How fit are you now compared with 6 months ago?

The abbreviated questionnaire often provides a gauge to whether the CR practitioner may need to apply a more detailed QOL assessment to better understand the status and needs of the individual patient.

Paired data on the condensed QOL survey were available for 1,305 assessments.

Self reported health

There were 48% of patients reporting a health status of very good or excellent at post assessment, compared with 17% at the pre assessment phase. Over half (54%) reported a feeling of improved health. Reductions in the numbers of patients reporting fair or poor health were observed, with only 2% of patients reporting poor health at post assessment.

Decreases in self reported health status were reported by 11% of patients, however caution should be exercised when interpreting this result as there are many confounding factors which may affect the health status of a patient with what is often a newly diagnosed complex chronic disease.
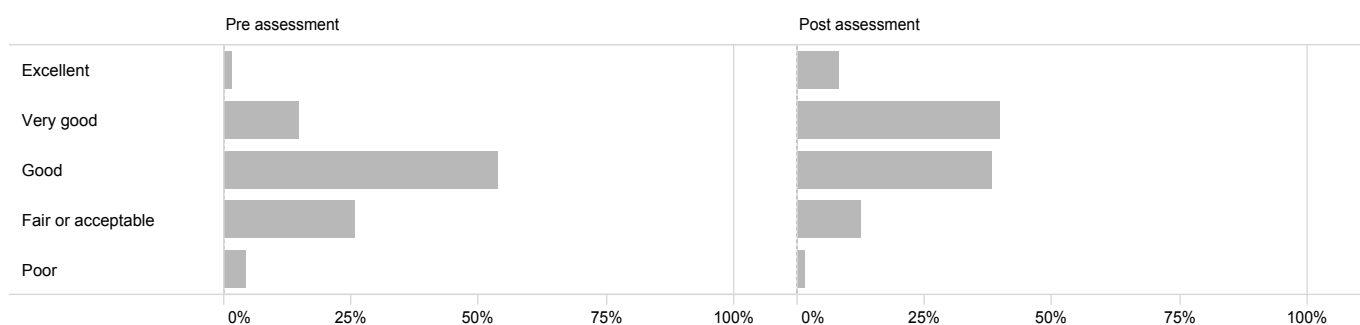
Figure 15: Comparison of patient reported health status at pre and post assessment

Table 22: Change in patient reported health status at pre and post assessment

	n (%)
Any improvement	699 (53.6)
No change	467 (35.8)
Any worse result	139 (10.7)
ALL	**1305 (100.0)**

Self reported mood

Approximately half of patients (51%) reported an improved mood compared to the pre assessment stage. The proportion of patients reporting excellent mood scores at post assessment increased from 4% to 10%, while those with very good mood scores increased from 19% to 45%.

There were 10% of patients who reported a decrease in mood, however it is reassuring to note an overall decrease in the proportion of patients reporting fair or poor mood.
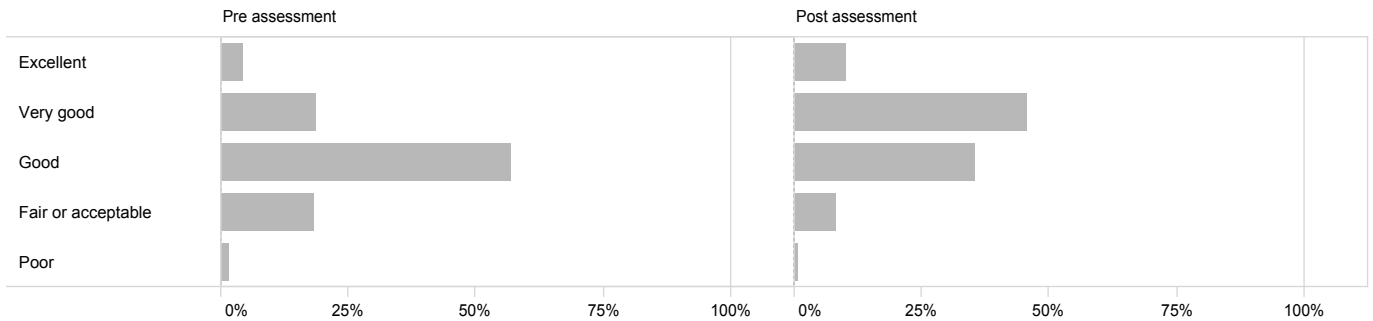
Figure 16: Comparison of patient reported mood at pre and post assessment

Table 23: Change in patient reported mood at pre and post assessment

	n (%)
Any improvement	662 (50.7)
No change	508 (38.9)
Any worse result	135 (10.3)
ALL	**1,305 (100.0)**

Self reported fitness

When asked to compare fitness level to the period six months prior to completing a CR program, 43% of patients reported that their fitness had improved. Decreases in fitness were reported by 18% of patients.

Issues such as the development of significant cardiac dysfunction as a result of myocardial infarction may explain a decline in fitness. Given the result is compared to a baseline six months prior to completing CR, the patient's index cardiac event may also have occurred in this time and therefore regression may not be unexpected.
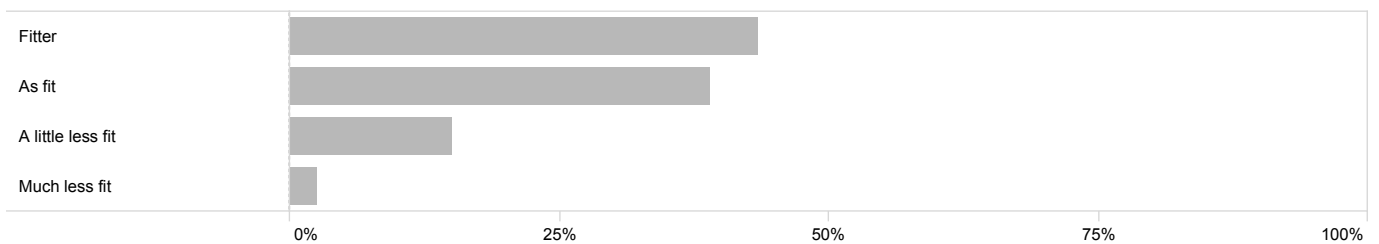
Figure 17: Patient reported change in fitness at post assessment

Table 24: Patient reported change in fitness at post assessment

	n (%)
Fitter	566 (43.4)
As fit	509 (39.0)
A little less fit	197 (15.1)
Much less fit	33 (2.5)
ALL	**1,305 (100.0)**

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Other patient reported outcomes

Smoking

There were 3,049 patients where smoking status at pre assessment and post assessment was available for analysis. For the vast majority of patients (96%), smoking status was unchanged over the course of the CR program. However, there was a slight decrease in the proportion of patients reported as current smokers (defined as smoking within the last 30 days), with 10% of patients identified as current smokers at the time of the pre assessment, which decreased to 8% at the time of the post assessment.

The change in current smoking status includes 3% of patients who reported that they had ceased smoking between the CR pre assessment and post assessment. However, conversely, 1% of patients who identified as former smokers at pre assessment reported that they had relapsed at post assessment.
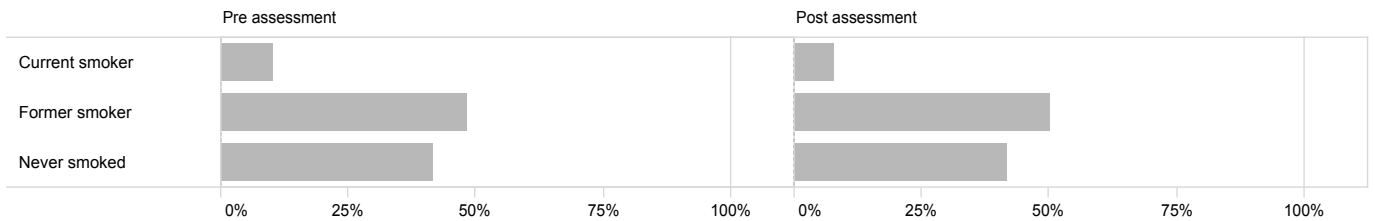
Figure 18: Patient reported smoking status at pre and post assessment

Table 25:   Change in patient reported smoking status at pre and post assessment

	n (%)
Ceased smoking	96 (3.1)
No change to smoking status	2,926 (96.0)
Relapsed smoker	27 (0.9)
ALL	**3,049 (100.0)**

Alcohol consumption

Patient reported alcohol consumption was available for comparison between 2,464 pre and post assessments. Almost one fifth (17%) reported unhealthy levels of alcohol consumption (exceeding 10 standard drinks per week or more than 4 standard drinks on any single day)[54] at the time of the pre assessment, which had reduced to 10% at the time of the post assessment.
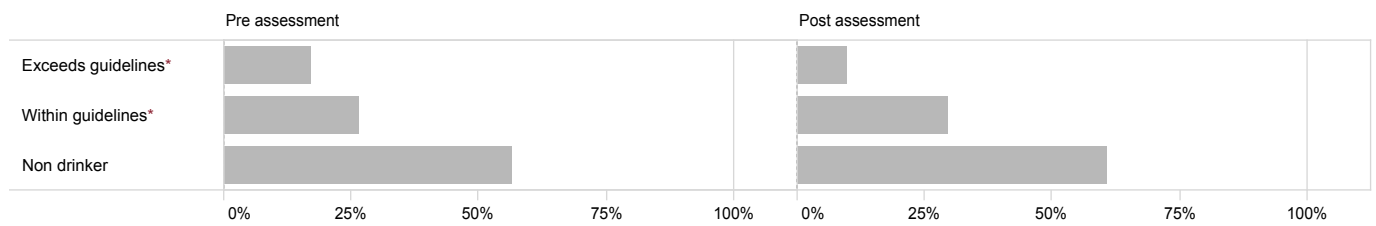
*   No more than 10 standard drinks per week, and no more than 4 standard drinks any single day of the week

Figure 19: Patient reported alcohol consumption at pre and post assessment

Table 26:   Patient reported alcohol consumption at pre and post assessment

	Pre assessment n (%)	Post assessment n (%)
Exceeds guideline	426 (17.3)	237 (9.6)
Within guideline	651 (26.4)	732 (29.7)
Non drinker	1,387 (56.3)	1,495 (60.7)
ALL	**2,464 (100.0)**	**2,464 (100.0)**

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Activity level

There were 2,462 patients for whom self reported activity level could be compared between the pre and post assessment. Approximately half of all patients (49%) reported an increased activity level following the completion of their CR program, with almost three quarters (73%) reporting sufficient levels of physical activity at the post assessment compared to 35% at the pre assessment.

The proportion of patients reported as inactive decreased from 18% at the pre assessment to 2% at the post assessment.
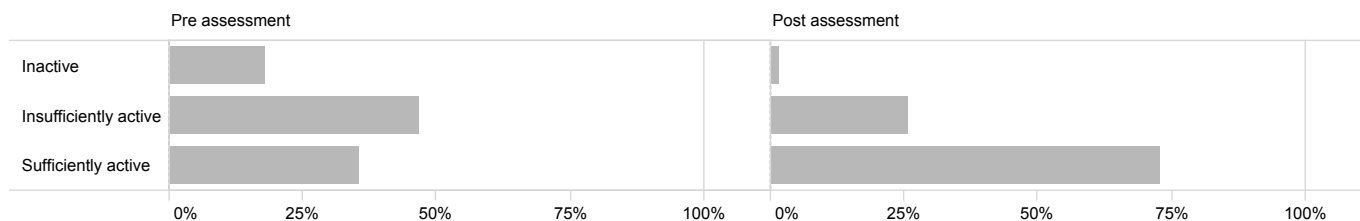
Figure 20: Patient reported activity level at pre and post assessment

Table 27:   Change in patient reported activity level at pre and post assessment

	n (%)
Improved	1,196 (48.6)
No change	1,167 (47.4)
Worsened	99 (4.0)
ALL	**2,462 (100.0)**

8.4   Failure to participate

There are many reasons a patient may not participate in a CR program. In this cohort, which includes patients who declined or were unsuitable during phase 1 and phase 2, the most common reason for not participating in a CR program was that the patient had declined (28%). Twenty one percent were medically inappropriate to participate, while 17% had been uncontactable or failed to attend.

For 2022 referrals, 1% were recorded as declined due to impacts of the global COVID-19 pandemic such as compulsory service closures, staff redeployment and patient unwillingness to proceed. While this is unchanged from the 2021 data, this may not reflect the true impact of COVID-19 on CR participation. During 2022, some CR programs were temporarily unavailable due to service closure. This may have resulted in referrals being redirected to other sites or patients declining to be referred while their closest site was not accepting referrals.

An ongoing initiative has been to further define the subset of patients who did not participate in CR. The aim is to increase the level of detail available to describe the barriers to participation, identify common themes and opportunities to improve patient participation rates.

In some of these instances, the clinician may still provide opportunistic education and advice to these patients, however this is difficult to incorporate into reporting.

A limiting factor for this analysis is the amount of data available to describe this cohort, as this is limited to the information included on the initial referral only.
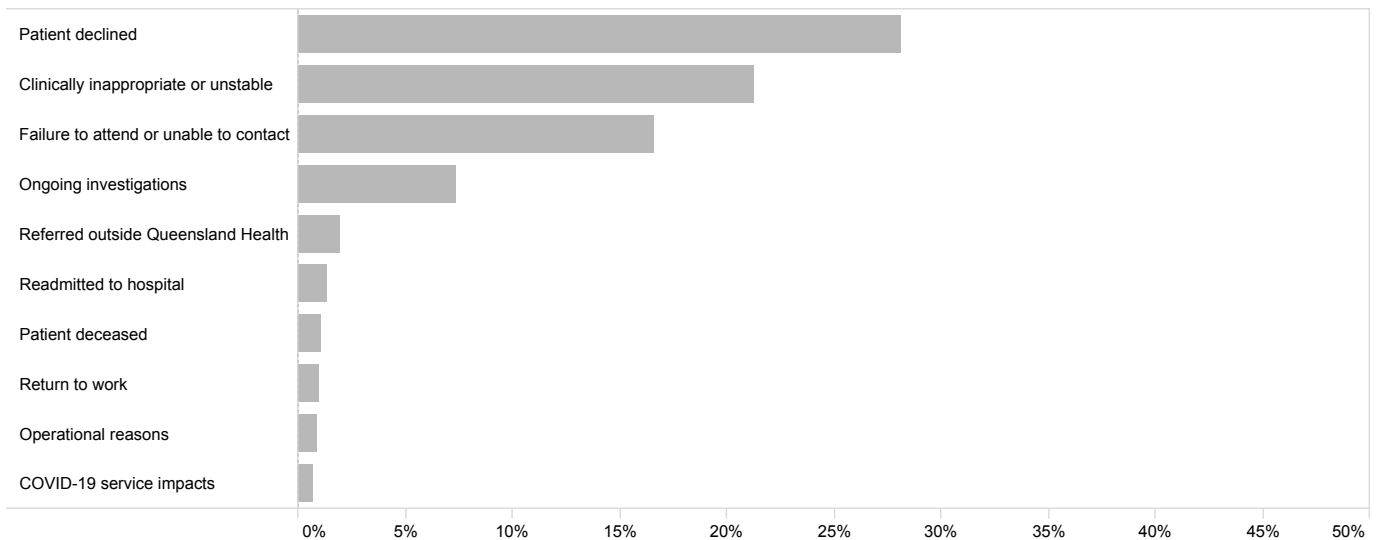
Not displaying other reasons (18%)

Figure 21: Reasons for no pre assessment being conducted

8.4.1 Age and gender

There was considerable variation in patient age when comparing patients who participated in CR as opposed to patients who declined or were not interested and patients who were medically unsuitable. Patients who participated in CR had a median age of 66 years, whilst patients who declined or were medically unsuitable had a median age four years older and three years older respectively.
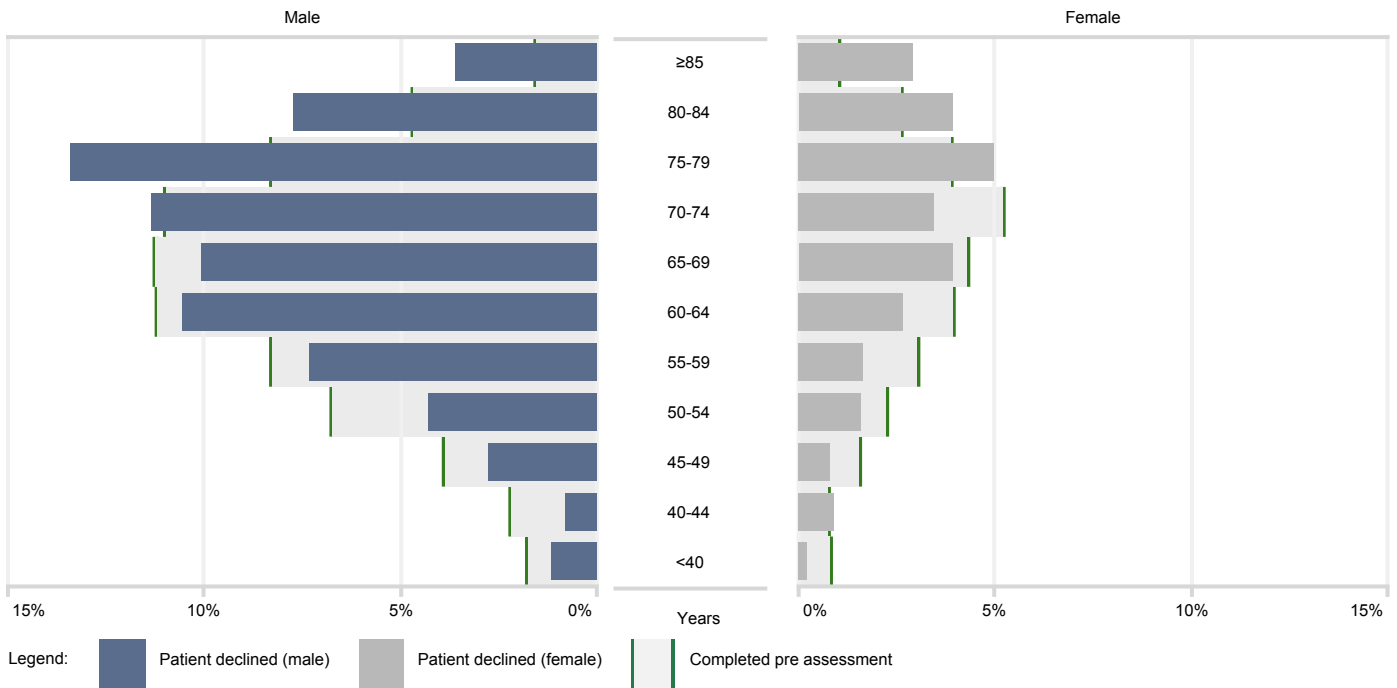
Figure 22: Patient age group and gender, patient declined vs. completed pre assessment
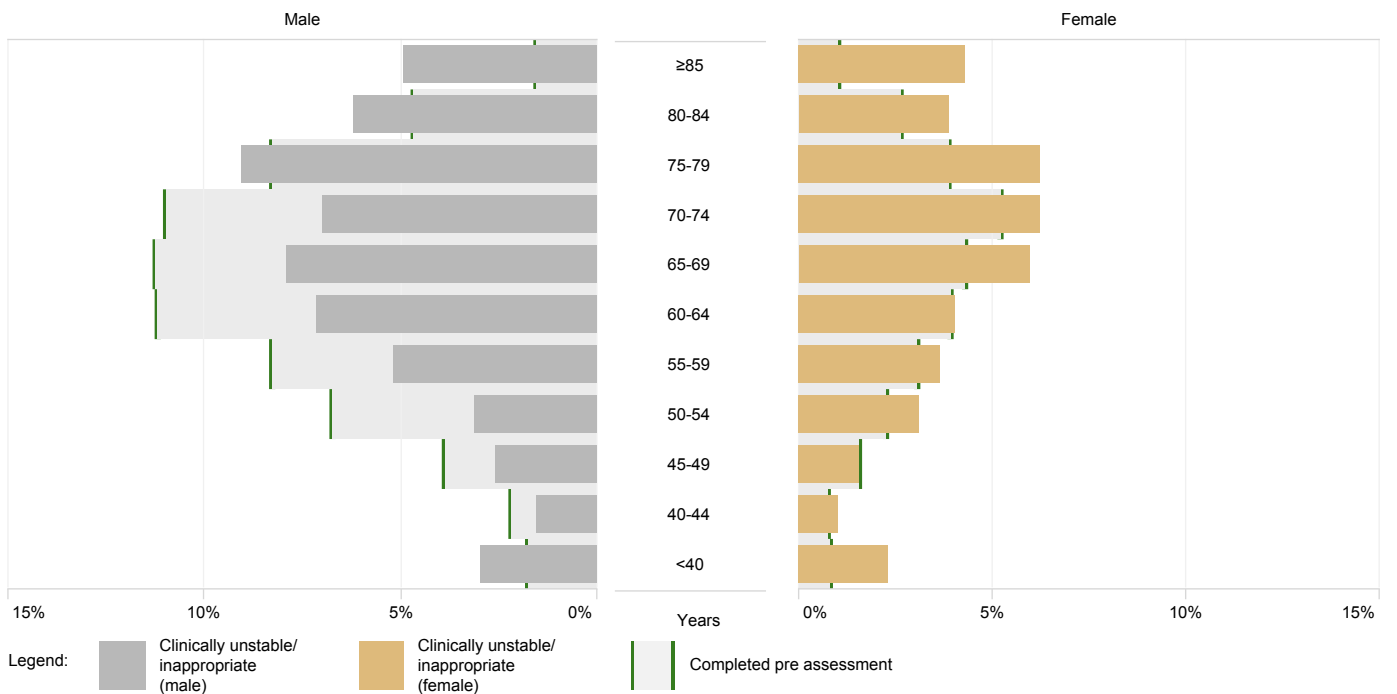
Figure 23: Patient age group and gender, clinically unstable/inappropriate vs. completed pre assessment

Table 28: Patient age (years) by program participation status

	Male Median (IQR)	Female Median (IQR)	ALL Median (IQR)
Pre assessment completed	65 (57–73)	67 (58–75)	66 (57–74)
Patient declined	69 (60–77)	72 (62–80)	70 (61–78)
Clinically unstable or inappropriate	69 (58–77)	69 (58–77)	69 (58–77)
Other reason not assessed	65 (56–74)	67 (56–75)	65 (56–74)

Table 29: Patient gender by program participation status

Gender	Pre assessment completed n (%)	Patient declined n (%)	Clinically unstable or inappropriate n (%)	Other reason not assessed n (%)
Male	4,511 (62.8)	747 (10.4)	445 (6.2)	1,478 (20.6)
Female	1,874 (59.8)	275 (8.8)	326 (10.4)	660 (21.1)
ALL	**6,385 (61.9)**	**1,022 (9.9)**	**771 (7.5)**	**2,138 (20.7)**

8.4.2   Diagnosis category

Of the patients who declined, 41% had a diagnosis of ischaemic heart disease and approximately 6% had valvular disease. The majority (54%) had an other diagnosis. By comparison, patients who had completed an initial assessment via CR were more likely to have a diagnosis of ischaemic heart disease or valvular heart disease (68% and 9% respectively).

Patients without IHD or valvular disease were least likely to commence a CR program, with 16% of these referrals declined by the patient and 14% declined by the service as they were not appropriate for cardiac rehabilitation.
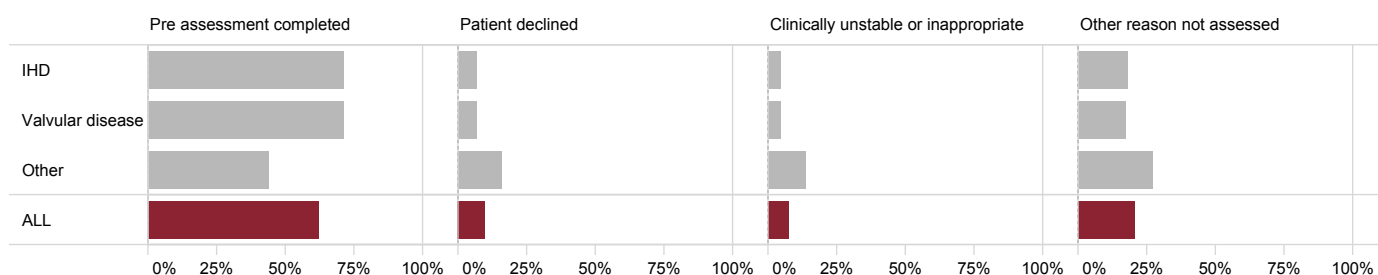
Figure 24: Proportion of cases by diagnosis category and program participation status

Table 30: Diagnosis category by program participation status

Diagnosis category	Pre assessment completed n (%)	Patient declined n (%)	Clinically unstable or inappropriate n (%)	Other reason not assessed n (%)
IHD	4,332 (70.9)	417 (6.8)	276 (4.5)	1,084 (17.7)
Valvular disease	576 (71.2)	57 (7.0)	35 (4.3)	141 (17.4)
Other	1,477 (43.5)	548 (16.1)	460 (13.5)	913 (26.9)
ALL	**6,385 (61.9)**	**1,022 (9.9)**	**771 (7.5)**	**2,138 (20.7)**

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8.4.3   Most recent procedure

For the cohort that proceeded to assessment, their most recent procedure was closely related to their participation status. 76% of patients who had a PCI procedure and 84% of patients who underwent CABG completed a pre assessment. This suggests that patients who have undergone an invasive cardiac procedure are more likely to have participated in a CR program.

Approximately half (52%) of patients who declined CR had no recent procedure specified. Furthermore, 23% of patients that elected not to participate in CR were recorded as having undergone PCI, while approximately 7% had undergone CABG (with or without a concomitant valve procedure).

Care should be taken when interpreting these findings as this data element is not always completed at the time of referral. Therefore, it may not fully reflect the patient's medical history.
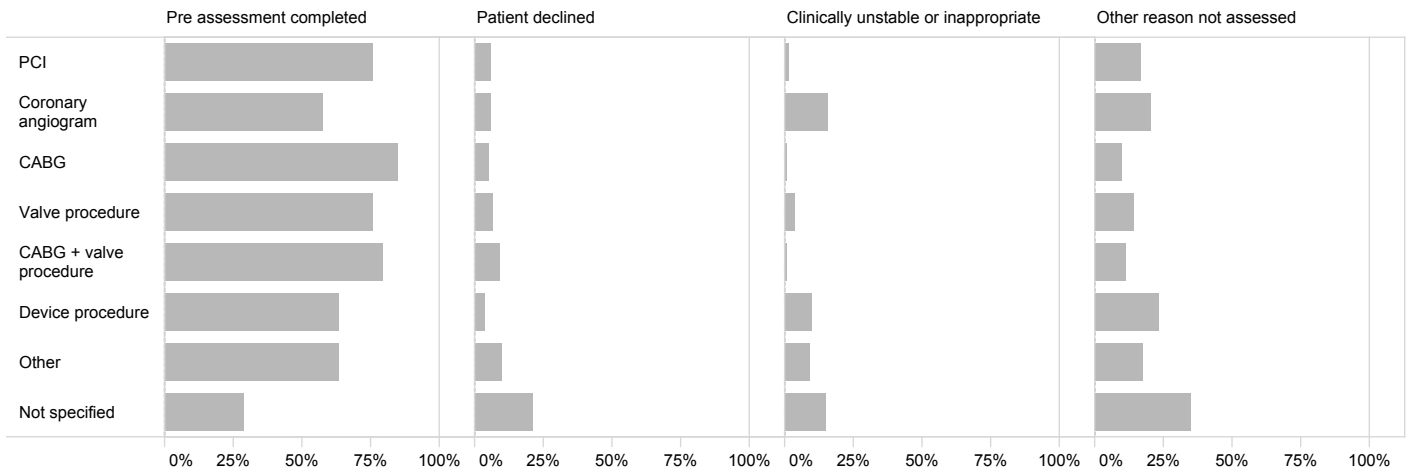
Figure 25: Proportion of referrals by most recent procedure and program participation status

Table 31:   Most recent procedure by program participation status

Most recent procedure	Pre assessment completed n (%)	Patient declined n (%)	Clinically unstable or inappropriate n (%)	Other reason not assessed n (%)
PCI	2,831 (75.7)	238 (6.4)	62 (1.7)	609 (16.3)
Coronary angiogram	910 (57.5)	95 (6.0)	253 (16.0)	324 (20.5)
CABG	947 (84.4)	60 (5.3)	7 (0.6)	108 (9.6)
Valve procedure	568 (75.6)	51 (6.8)	27 (3.6)	105 (14.0)
CABG + valve procedure	129 (79.1)	15 (9.2)	1 (0.6)	18 (11.0)
Device procedure	106 (63.5)	6 (3.6)	16 (9.6)	39 (23.4)
Other	162 (63.8)	24 (9.4)	23 (9.1)	45 (17.7)
Not specified	732 (28.9)	533 (21.0)	382 (15.1)	890 (35.1)
ALL	**6,385 (61.9)**	**1,022 (9.9)**	**771 (7.5)**	**2,138 (20.7)**

8.4.4   Place of residence

There was some variation in patient participation in CR based on place of residence, with higher proportions of patients who did not attend CR residing in regional and remote areas of Queensland.

While there are many reasons a patient may not participate in CR, this trend toward lower participation rates for patients in regional areas should be noted for service planning and model of care selection. These figures should be interpreted with caution due to the small numbers residing in the remote areas.

Table 32:   Remoteness classification by program participation status

Remoteness area*	Pre assessment completed n (%)	Patient declined n (%)	Clinically unstable or inappropriate n (%)	Other reason not assessed n (%)
Major cities	3,479 (64.9)	569 (10.6)	264 (4.9)	1,045 (19.5)
Inner regional	1,738 (63.4)	260 (9.5)	165 (6.0)	579 (21.1)
Outer regional	948 (53.2)	160 (9.0)	282 (15.8)	391 (22.0)
Remote	65 (43.3)	14 (9.3)	20 (13.3)	51 (34.0)
Very remote	144 (60.0)	10 (4.2)	34 (14.2)	52 (21.7)
ALL	**6,374 (62.1)**	**1,013 (9.9)**	**765 (7.4)**	**2,118 (20.6)**

Excludes missing data (0.4%)

*   Classified by Australian Statistical Geography Standard remoteness area

8.4.5   Indigenous status

Considerable variation in program participation was observed for Aboriginal and Torres Strait Islander patients when compared to patients of other descent. Less than half (47%) of Aboriginal and Torres Strait Islander patients participated in the initial CR pre assessment, compared to 63% of other patients.

This finding should be noted and considered as a potential focus for future service improvement activities.

Table 33:   Program participation by Indigenous status

Indigenous status	Pre assessment completed n (%)	Patient declined n (%)	Clinically unstable or inappropriate n (%)	Other reason not assessed n (%)
Indigenous	326 (46.8)	49 (7.0)	100 (14.3)	222 (31.9)
Non-Indigenous	5,750 (62.6)	926 (10.1)	646 (7.0)	1,857 (20.2)
ALL	**6,076 (61.5)**	**975 (9.9)**	**746 (7.6)**	**2,079 (21.1)**

Excludes missing data (4.3%)

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9 Clinical indicators

The CR clinical indicator program has been focused towards the timely provision of CR to admitted patients discharged from public hospitals. This requires collaboration between the acute and outpatient services, with each having their own targets (clinical indicators 1 and 2a respectively).

Overall system performance is measured through clinical indicator 3, which requires the acute and outpatient services to both meet their respective targets. For the purpose of this indicator any referrals crossing between HHSs are counted under both the referring and receiving HHS/organisation.

Table 34:   Cardiac rehabilitation clinical indicators

#	Clinical indicator	Description
1	Timely referral – inpatients	Documented referral to CR within three days of discharge
2a	Timely assessment – inpatients	Initial CR pre assessment completed within 28 days of discharge
2b	Timely assessment – non acute patients	Initial CR pre assessment completed within 28 days of referral date
3	Timely journey – inpatients	Composite of timely referral and assessment
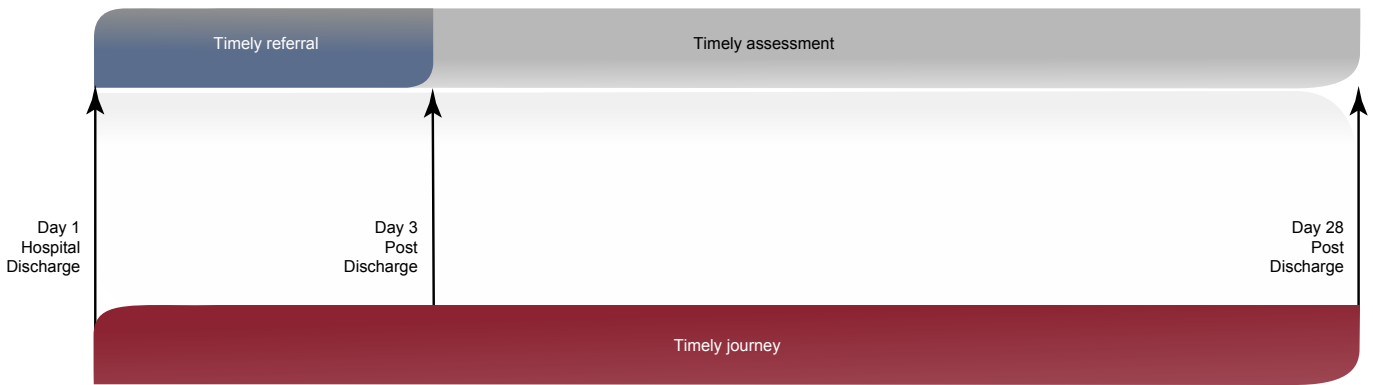
Figure 26: Timely referral, assessment and overall journey for inpatient referrals

9.1   Timely referral

This indicator examines the proportion of inpatient referrals to CR originating from a public hospital which had been provided to the CR program in a timely manner (within 3 days of referral). This requires the referral to be submitted to the outpatient program within three days of the patient being discharged from hospital.

Overall, performance is high with 92% of referrals contributed to QCOR being submitted within three days of discharge.

Table 35:   Timely referrals by referring HHS

Referring HHS/organisation	Total inpatient referrals n	Total eligible for analysis n	Target met n (%)
Cairns and Hinterland	517	510	502 (98.4)
Central Queensland	238	217	210 (96.8)
Darling Downs	84	81	77 (95.1)
Gold Coast	784	777	713 (91.8)
Mackay	163	156	150 (96.2)
Mater Health Services	84	83	46 (55.4)
Metro North	1,816	1,802	1,575 (87.4)
Metro South	1,752	1,731	1,660 (95.9)
North West	1	1	N/A
Sunshine Coast	640	625	610 (97.6)
Townsville	509	506	385 (76.1)
West Moreton	128	126	125 (99.2)
Wide Bay	3	3	N/A
Statewide	**6,719**	**6,618**	**6,057 (91.5)**

N/A: Not displayed due to ‹20 referrals eligible for analysis

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Referred by HHS	Referred by hospital	Total analysed, n	
Cairns and Hinterland	Cairns Hospital	510	
Central Queensland	Capricorn Coast Hospital	1	N/A
	Gladstone Hospital	1	N/A
	Rockhampton Hospital	215	
Darling Downs	Chinchilla Hospital	1	N/A
	Toowoomba Hospital	80	
Gold Coast	Gold Cost University Hospital	776	
	Robina Hospital	1	N/A
Mackay	Mackay Base Hospital	156	
Mater Health Services	Mater Hospital Brisbane	83	
Metro North	Caboolture Hospital	90	
	Redcliffe Hospital	34	
	Royal Brisbane & Women's Hospital	476	
	The Prince Charles Hospital	1,202	
Metro South	Logan Hospital	36	
	Princess Alexandra Hospital	1,571	
	Queen Elizabeth II Jubilee Hospital	77	
	Redland Hospital	47	
North West	Mount Isa Base Hospital	1	N/A
Sunshine Coast	Gympie Hospital	1	N/A
	Sunshine Coast University Hospital	624	
Townsville	Townsville University Hospital	506	
West Moreton	Ipswich Hospital	126	
Wide Bay	Bundaberg Base Hospital	1	N/A
	Gayndah Hospital	2	N/A
Statewide			

N/A: Not displayed due to <20 referrals eligible for analysis

Figure 27: Timely referrals by referring hospital

9.2   Timely assessment – inpatients

This indicator examines the proportion of referrals to CR which proceed to an assessment within 28 days of discharge. In order to retain focus on the performance of the outpatient CR program, referrals which are not provided in a timely manner (<3 days from discharge) have been excluded from the analysis. Further to this, other ineligibility criteria are outlined in Table 36. The exclusions are applied where information is available and has been documented in the application.

Overall, more than half of all patients (58%) are being assessed in a timely manner, however there was some variation across health services.

Table 36:   Summary of referrals ineligible for timely assessment clinical indicator – inpatients

Summary	n
Not referred within 3 days of discharge	518
Clinically unstable/inappropriate	108
Same day admission	98
Patient accepted onto existing program	67
Referred outside of Queensland Health	47
Patient readmitted to hospital	42
Patient deceased	31
Total ineligible	**911**

Table 37:   Timely assessment indicator by outpatient HHS – inpatients

Outpatient HHS/division	Total inpatient referrals n	Total eligible for analysis n	Target met n (%)
Cairns and Hinterland	545	491	298 (60.7)
Central Queensland	394	313	162 (51.8)
Central West	13	9	N/A
Darling Downs	272	236	106 (44.9)
Gold Coast	785	671	516 (76.9)
Health Contact Centre	1,113	921	425 (46.1)
Mackay	209	179	49 (27.4)
Metro North	840	739	454 (61.4)
Metro South	915	817	524 (64.1)
North West	33	29	16 (55.2)
South West	30	29	20 (69.0)
Sunshine Coast	743	662	401 (60.6)
Townsville	246	191	87 (45.5)
West Moreton	421	383	187 (48.8)
Wide Bay	160	138	95 (68.8)
Statewide	**6,719**	**5,808**	**3,340 (57.5)**

N/A: Not displayed due to <20 referrals eligible for analysis

Outpatient HHS/division	Outpatient program	Total analysed, n	
Cairns and Hinterland	Atherton	44	
	Cairns	384	
	Innisfail	37	
	Mareeba	30	
	Mossman	21	
	Tully	22	
Central Queensland	Biloela	3	N/A
	Capricorn Coast	47	
	Gladstone	69	
	Mount Morgan	28	
	Rockhampton	226	
Central West	Barcaldine	2	N/A
	Blackall	3	N/A
	Longreach	7	N/A
Darling Downs	Chinchilla-Miles	21	
	Dalby-Tara	27	
	Goondiwindi	13	N/A
	Kingaroy	24	
	Stanthorpe	11	N/A
	Texas OPCR program	1	N/A
	Toowoomba	135	
	Warwick	36	
Gold Coast	Gold Coast	779	
Health Contact Centre	SMoCC	1,100	
Mackay	Bowen	7	N/A
	Mackay	170	
	Proserpine	25	
Metro North	Caboolture	261	
	Chermside	237	
	North Lakes	250	
	Redcliffe	87	
Metro South	Bayside	249	
	Eight Mile Plains	125	
	Inala	91	
	Logan-Beaudesert	367	
	Princess Alexandra Hospital	73	
North West	Mt Isa	33	
South West	Charleville	3	N/A
	Roma	25	
	St George	2	N/A
Sunshine Coast	Caloundra	192	
	Gympie	153	
	Maroochydore	155	
	Nambour	134	
	Noosa	95	
Townsville	Ayr	27	
	Ingham	19	N/A
	Townsville	197	
West Moreton	Ipswich	416	
Wide Bay	Biggenden	3	N/A
	Gayndah	5	N/A
	Hervey Bay	93	
	Maryborough	54	
	Mundubbera	3	N/A
Statewide			

N/A: Not displayed due to <20 referrals eligible for analysis

Figure 28: Timely assessment by outpatient program – inpatients

9.3 Timely assessment – non acute patients

This indicator examines the proportion of referrals from the non acute setting which proceed to an assessment within 28 days of referral. The majority of non acute patients (64%) are being assessed in a timely manner, with some notable variation between health services.

Table 38: *Summary of referrals ineligible for timely assessment clinical indicator – non acute patients*

Summary	n
Clinically unstable/inappropriate	25
Referred outside of Queensland Health	23
Patient accepted onto an existing program	12
Patient deceased	7
Patient admitted to hospital	6
Total ineligible	**73**

Table 39: *Timely assessment indicator by outpatient HHS – non acute patients*

Outpatient HHS/division	Total non acute referrals n	Total eligible for analysis n	Target met n (%)
Cairns and Hinterland	94	91	66 (72.5)
Central Queensland	483	471	319 (67.7)
Central West	5	5	N/A
Darling Downs	143	140	76 (54.3)
Gold Coast	282	267	219 (82.0)
Health Contact Centre	155	153	79 (51.6)
Mackay	84	83	42 (50.6)
Metro North	450	436	274 (62.8)
Metro South	413	404	264 (65.3)
North West	19	18	N/A
South West	36	35	29 (82.9)
Sunshine Coast	100	94	60 (63.8)
Townsville	68	68	29 (42.6)
West Moreton	234	230	129 (56.1)
Wide Bay	32	30	25 (83.3)
Statewide	**2,598**	**2,525**	**1,624 (64.3)**

N/A: Not displayed due to <20 referrals eligible for analysis

Outpatient HHS/division	Outpatient program	Total analysed, n	
Cairns and Hinterland	Atherton	14	N/A
	Cairns	36	
	Innisfail	18	N/A
	Mareeba	8	N/A
	Mossman	8	N/A
	Tully	7	N/A
Central Queensland	Capricorn Coast	101	
	Gladstone	89	
	Mount Morgan	49	
	Rockhampton	232	
Central West	Barcaldine	1	N/A
	Blackall	4	N/A
Darling Downs	Chinchilla-Miles	9	N/A
	Dalby-Tara	15	N/A
	Goondiwindi	2	N/A
	Kingaroy	20	
	Toowoomba	58	
	Warwick	36	
Gold Coast	Gold Coast	267	
Health Contact Centre	SMoCC	153	
Mackay	Bowen	1	N/A
	Mackay	81	
	Proserpine	1	N/A
Metro North	Caboolture	121	
	Chermside	71	
	North Lakes	161	
	Redcliffe	83	
Metro South	Bayside	177	
	Eight Mile Plains	78	
	Inala	14	N/A
	Logan-Beaudesert	128	
	Princess Alexandra Hospital	7	N/A
North West	Mt Isa	18	N/A
South West	Charleville	10	N/A
	Roma	12	N/A
	St George	13	N/A
Sunshine Coast	Caloundra	33	
	Gympie	21	
	Maroochydore	16	N/A
	Nambour	13	N/A
	Noosa	11	N/A
Townsville	Ayr	2	N/A
	Ingham	2	N/A
	Townsville	64	
West Moreton	Ipswich	230	
Wide Bay	Biggenden	7	N/A
	Eidsvold	2	N/A
	Gayndah	4	N/A
	Hervey Bay	5	N/A
	Maryborough	5	N/A
	Mundubbera	7	N/A
Statewide			

N/A: Not displayed due to <20 referrals eligible for analysis

Figure 29: Timely assessment by outpatient program – non acute patients

9.4 Timely journey

This patient-centric measure of overall system performance requires strong coordination and links between the referring acute and outpatient CR sites. It measures the proportion of eligible inpatient referrals submitted by the acute site within three days of discharge, as well as the ability of the receiving CR program to meet the target of completing a pre assessment within 28 days of discharge.

Referrals are excluded from the analysis for the reasons outlined in Table 40. The exclusions are applied where information is available and has been documented in the application.

It is important to note that for the purpose of this indicator, any referral which crosses between HHSs is counted for both participating services.

Table 40:   Summary of referrals ineligible for timely journey clinical indicator – inpatients

Summary	n
Clinically unstable/inappropriate	108
Same day admission	98
Patient accepted onto existing program	67
Referred outside of Queensland Health	47
Patient readmitted to hospital	42
Patient deceased	31
Total ineligible	**393**

Table 41:   Timely journey indicator by participating HHS – inpatients

Participating HHS/ organisation	Total inpatient referrals* n	Total eligible for analysis* n	Target met n (%)
Cairns and Hinterland	580	540	308 (57.0)
Central Queensland	422	370	168 (45.4)
Central West	13	10	N/A
Darling Downs	303	278	112 (40.3)
Gold Coast	820	763	530 (69.5)
Health Contact Centre	1113	1,062	425 (40.0)
Mackay	222	211	56 (26.5)
Mater Health Services	84	83	35 (42.2)
Metro North	1850	1,764	930 (52.7)
Metro South	1876	1,804	970 (53.8)
North West	33	33	16 (48.5)
South West	30	30	20 (66.7)
Sunshine Coast	809	744	423 (56.9)
Townsville	510	503	185 (36.8)
West Moreton	434	414	191 (46.1)
Wide Bay	160	148	95 (64.2)
Statewide	**6,719**	**6,326**	**3,341 (52.8)**

N/A: Not displayed due to <20 referrals eligible for analysis

*   Includes both incoming and outgoing referrals

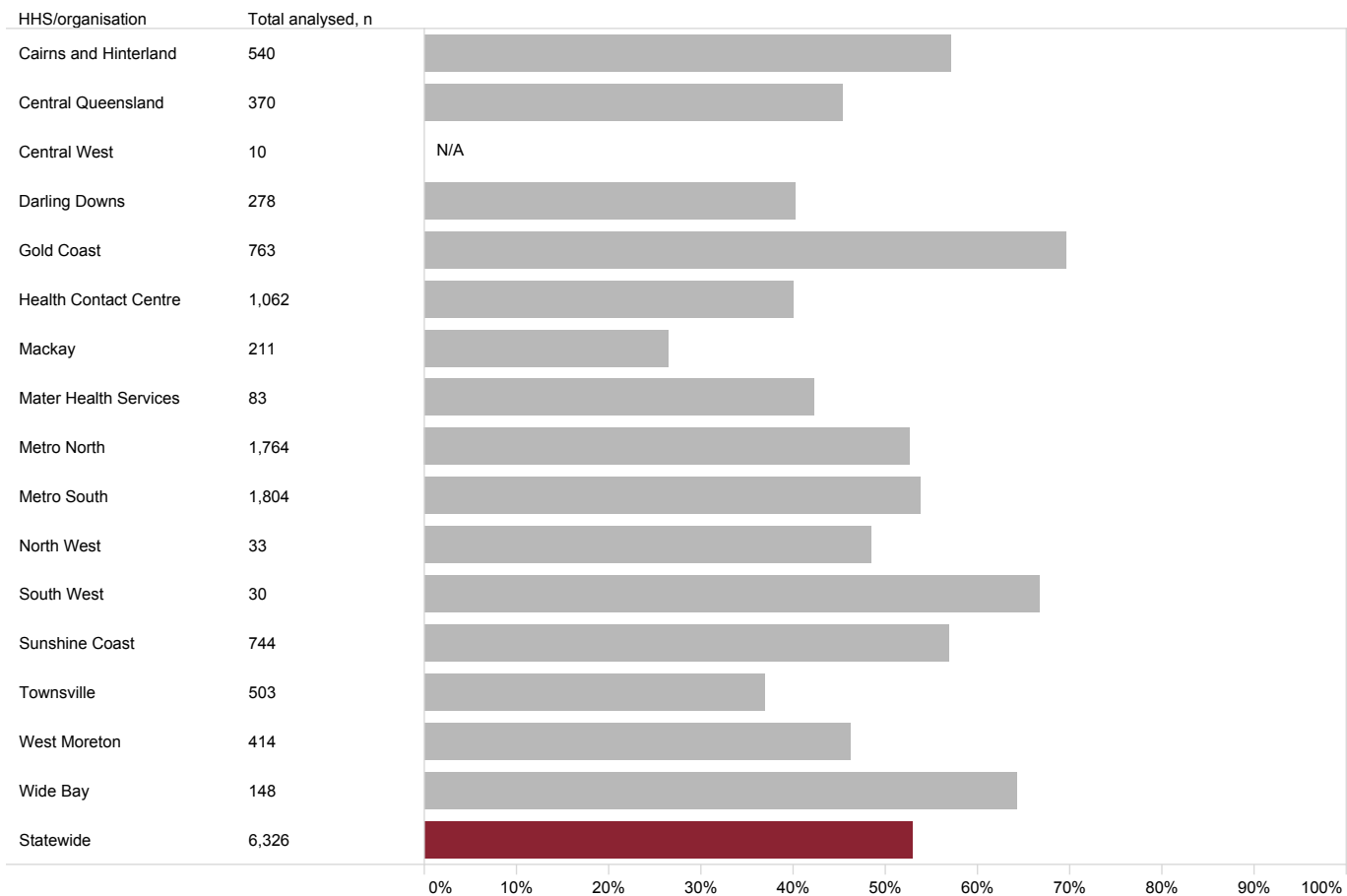| HHS/organisation	Total analysed, n	
Cairns and Hinterland	540	
Central Queensland	370	
Central West	10	N/A
Darling Downs	278	
Gold Coast	763	
Health Contact Centre	1,062	
Mackay	211	
Mater Health Services	83	
Metro North	1,764	
Metro South	1,804	
North West	33	
South West	30	
Sunshine Coast	744	
Townsville	503	
West Moreton	414	
Wide Bay	148	
Statewide	6,326	

Figure 30: Timely journey indicator by participating HHS – inpatients

9.5   Clinical indicator trends, 2019–2022

The QCOR CR module has been in operation since July 2017, since then there has been a breadth of data captured by clinicians in relation to education, exercise and support programs designed to help patients make healthy, sustainable lifestyle choices. Undertaking CR after a cardiac event or procedure is aimed at reducing the likelihood of readmission and a cardiac cause of death.

With almost five years of data capture, longitudinal follow-up of clinical indicators is possible.

Clinical indicator 1

Submitting a timely referral, within 3 days, to an outpatient CR service remains high with 92% of referrals contributed to QCOR being submitted within three days of discharge, reduced by one percent from 2021 and 2020 (93%).

Clinical indicator 2a

Initial CR pre assessment for inpatient referrals, completed within 28 days of discharge for 2022 (58%) has declined 6% since 2021 (64%). However, the proportion of inpatients being seen in a timely manner in 2022 is similar to that noted in 2019 (59%).

Clinical indicator 2b

Timely assessment for non acute patients, completed within 28 days of referral date in 2022 is at the highest level seen since 2019 (61%).

Clinical indicator 3

The proportion of inpatients completing CR in a timely manner has reduced from 59% in 2021 to 53% in 2022, this figure is at the lowest observed level since 2019 (56%).
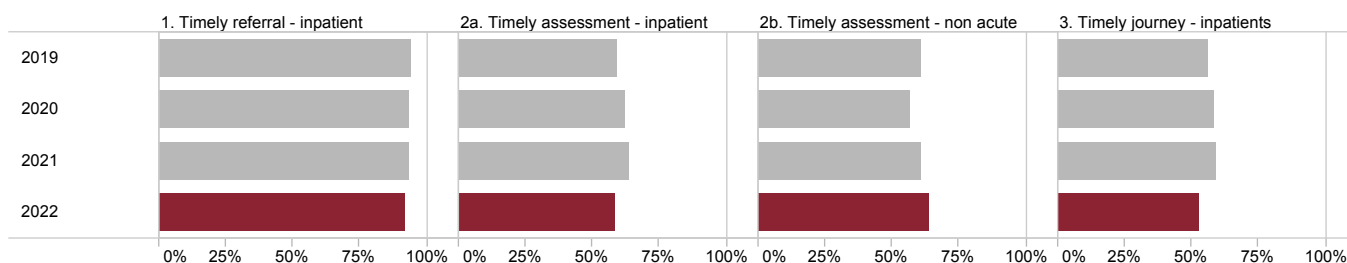

Figure 31: Clinical indicator trends, 2019–2022

Cardiac Rehabilitation

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Glossary

6MWT	Six Minute Walk Test
ACC	Aristotle Comprehensive Complexity
ACEI	Angiotensin Converting Enzyme Inhibitor
ACP	Advanced Care Paramedic
ACS	Acute Coronary Syndromes
AEP	Accredited Exercise Physiologist
ANZCORS	Australia and New Zealand Congenital Outcomes Registry for Surgery
ANZSCTS	Australian and New Zealand Society of Cardiac and Thoracic Surgeons
AQoL	Assessment of Quality of Life
ARB	Angiotensin II Receptor Blocker
ARNI	Angiotensin Receptor-Neprilysin Inhibitors
ASD	Atrial Septal Defect
AV	Atrioventricular
AVNRT	Atrioventricular Nodal Re-entry Tachycardia
AVRT	Atrioventricular Re-entrant Tachycardia
BCIS	British Cardiovascular Intervention Society
BiV	Biventricular
BMI	Body Mass Index
BNH	Bundaberg Hospital
BSSLTx	Bilateral Sequential Single Lung Transplant
CABG	Coronary Artery Bypass Graft
CAD	Coronary Artery Disease
CBH	Caboolture Hospital
CCL	Cardiac Catheter Laboratory
CCP	Critical Care Paramedic
CH	Cairns Hospital
CI	Clinical Indicator
CIED	Cardiac Implantable Electronic Device
CNC	Clinical Nurse Consultant
COVID-19	Coronavirus disease 2019
CPB	Cardiopulmonary Bypass
CR	Cardiac Rehabilitation
CRT	Cardiac Resynchronisation Therapy
CS	Cardiac Surgery
CVA	Cerebrovascular Accident
CVD	Cardiovascular Disease
DAOH	Days Alive and Out of Hospital
DOSA	Day of Surgery Admission
DSWI	Deep Sternal Wound Infection
ECG	12 lead Electrocardiograph
ECMO	Extracorporeal membrane oxygenation
ED	Emergency Department
eGFR	Estimated Glomerular Filtration Rate
EP	Electrophysiology
EuroSCORE	European System for Cardiac Operative Risk Evaluation
EWMA	Exponentially Weighted Moving Average
FdECG	First Diagnostic Electrocardiograph
FMC	First Medical Contact
FTR	Failure to Rescue
GAD	Generalised Anxiety Disorder
GC	Genetic Counsellor
GCCH	Gold Coast Community Health
GCS	Glasgow Coma Scale
GCUH	Gold Coast University Hospital
GLH	Gladstone Hospital
GP	General Practitioner
GYH	Gympie Hospital
HB	Haemoglobin
HBH	Hervey Bay Hospital (includes Maryborough)
HCC	Health Contact Centre
HF	Heart Failure
HFpEF	Heart Failure with Preserved Ejection Fraction
HFrEF	Heart Failure with Reduced Ejection Fraction
HFSS	Heart Failure Support Service
HHS	Hospital and Health Service
HOCM	Hypertrophic Obstructive Cardiomyopathy
IC	Interventional Cardiology
ICD	Implantable Cardioverter Defibrillator
IE	Infective Endocarditis
IER	Index of Economic Resources
IEO	Index of Education and Occupation
IHD	Ischaemic Heart Disease
IHT	Inter hospital Transfer
IPCH	Ipswich Community Health
IQR	Inter Quartile Range
IRSAD	Index of Relative Socioeconomic Advantage and Disadvantage
IRSD	Index of Relative Socioeconomic Disadvantage
IVDU	Intravenous Drug Use
LAA	Left Atrial Appendage
LAD	Left Anterior Descending Artery
LCX	Circumflex Artery
LGH	Logan Hospital
LMCA	Left Main Coronary Artery
LOS	Length Of Stay
LV	Left Ventricle

LVEF	Left Ventricular Ejection Fraction
LVOT	Left Ventricular Outflow Tract
MDT	Multidisciplinary Team Meeting
MBH	Mackay Base Hospital
MI	Myocardial Infarction
MIH	Mt Isa Hospital
MKH	Mackay Base Hospital
MRA	Mineralocorticoid Receptor Antagonists
MSSA	Methicillin Susceptible Staphylococcus Aureus
MTHB	Mater Adult Hospital, Brisbane
NCDR	The National Cardiovascular Data Registry
NCS	Networked Cardiac Services
NN	Nurse Navigator
NP	Nurse Practitioner
NRBC	Non-Red Blood Cells
NSTEMI	Non-ST Elevation Myocardial Infarction
OOHCA	Out of Hospital Cardiac Arrest
ORIF	Open Reduction Internal Fixation
PAH	Princess Alexandra Hospital
PCI	Percutaneous Coronary Intervention
PDA	Patent Ductus Arteriosus
PFO	Patent Foramen Ovale
PHQ	Patient Health Questionnaire
PICU	Paediatric intensive care unit
PPM	Permanent Pacemaker
PROMS	Patient Reported Outcome Measures
QAC	Quality Assurance Committee
QAS	Queensland Ambulance Service
QCCN	Queensland Cardiac Clinical Network
QCGP	Queensland Cardiology Genomics Project
QCOR	Queensland Cardiac Outcomes Registry
QEII	Queen Elizabeth II Jubilee Hospital
QHAPDC	Queensland Hospital Admitted Patient Data Collection
QPCR	Queensland Paediatric Cardiac Research
RBC	Red Blood Cells
RBWH	Royal Brisbane & Women's Hospital
RCA	Right Coronary Artery
RDH	Redcliffe Hospital
RHD	Rheumatic Heart Disease
RKH	Rockhampton Hospital
RLH	Redland Hospital
RVOT	Right Ventricular Outflow Tract
SAVR	Surgical Aortic Valve Replacement

SCCIU	Statewide Cardiac Clinical Informatics Unit
SCUH	Sunshine Coast University Hospital
SEIFA	Socioeconomic Indexes for Areas
SGLT2	Sodium-Glucose Cotransporter-2
SHD	Structural Heart Disease
SIR	Standardised Incidence Ratio
SMoCC	Self Management of Chronic Conditions
STEMI	ST-Elevation Myocardial Infarction
STS	Society of Thoracic Surgery
SVT	Supraventricular Tachycardia
TAVR	Transcatheter Aortic Valve Replacement
TIMI	Thrombolysis in Myocardial Infarction
TMVR	Transcatheter Mitral Valve Replacement
TNM	Tumour, Lymph Node, Metastases
TPCH	The Prince Charles Hospital
TPVR	Transcatheter Pulmonary Valve Replacement
TUH	Townsville University Hospital
TWH	Toowoomba Hospital
TTE	Transthoracic echocardiogram
VAD	Ventricular Assist Device
VATS	Video Assisted Thoracic Surgery
VCOR	Victorian Cardiac Outcomes Registry
VF	Ventricular Fibrillation
VSD	Ventricular Septal Defect