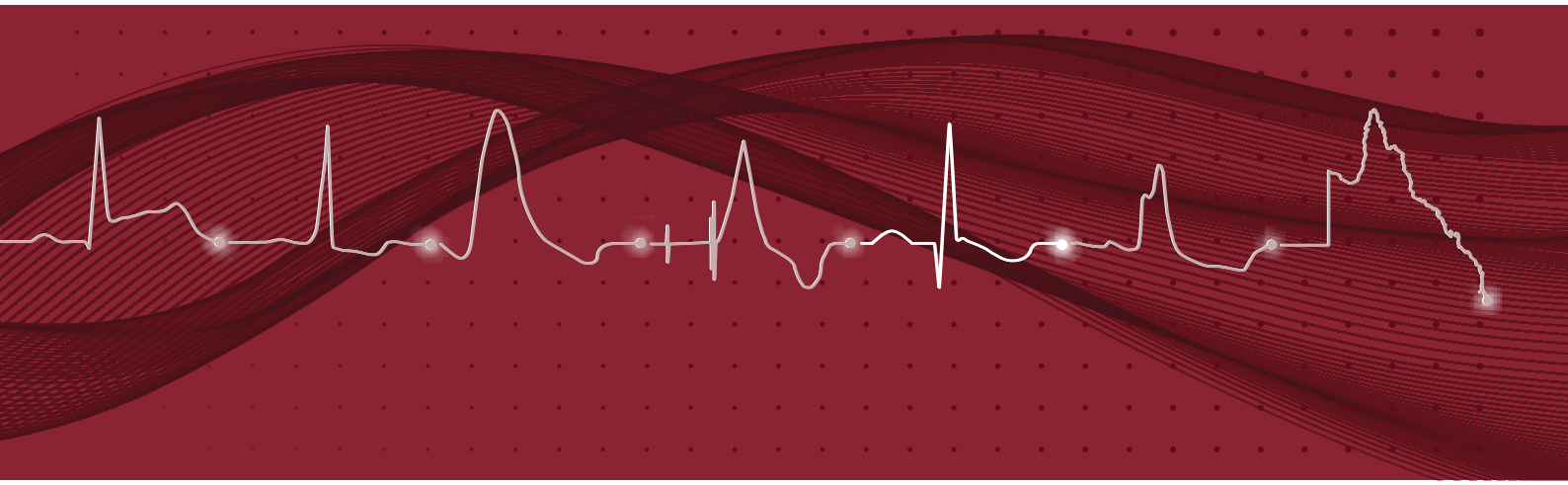
Queensland Cardiac Clinical Network

Queensland Cardiac Outcomes Registry
2021 Annual Report

Cardiac Rehabilitation Audit



Queensland Cardiac Outcomes Registry
2021 Annual Report

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Contents

1 Message from the QCCN Chair

Evolution and growth have seen QCOR become far more than a clinical quality registry and fulfil many more roles and functions than traditional registries. In compiling this seventh QCOR Annual Report we can reflect on the key deliverables and impact that the Registry has across many domains of healthcare and the health system in Queensland.

Despite declines in measures of burden of disease, cardiovascular disease and coronary heart disease are conditions with the highest burden of disease and mortality rates for Queenslanders. With the relatively contemporary nature of many of the interventions used to treat cardiovascular disease many analyses, risk scores and quality assurance frameworks exist, allowing the treatment of cardiac disease to be closely monitored. This data rich environment sets it apart from many other medical fields.

In its seventh publication year, this wide-reaching quality and safety program now comprises of cumulative analysis of over 250,000 patient interactions with the Queensland public health system for cardiac disease.

As the program develops and grows, we are frequently asked what is exceptional about QCOR? The answers are compelling and far-reaching. It is the broadest cardiac clinical quality registry of its kind in Australia. It is underpinned by point of care clinical systems and applications that allow clinicians to perform their role at the highest level, knowing their daily activities are supported by quality improvement opportunities. It is a clinical quality program that offers tools, insights, benchmarking and clinical excellence initiatives. It offers the means to enact multimillion-dollar consumables savings programs allowing healthcare money to be reinvested into patient care. But most importantly it is a tool that offers transparent, meaningful clinician-led solutions that aim to improve the health outcomes for all Queenslanders.

In the third year of the global coronavirus pandemic, healthcare providers have faced new and continuing challenges that demand innovative solutions to support the provision of first-class healthcare. The current report confirms that those involved in managing heart and lung disease have delivered volumes of work similar to, or, exceeding those observed in the pre-pandemic era. More importantly, despite unprecedented system stress, the Queensland cardiac community has rallied to maintain high standards of care that are demonstrated in the 2021 outcomes analysis.

Looking forward, we keenly await the delivery of a contemporary statewide cardiovascular information system for diagnostic and interventional cardiology and echocardiography. Investment in such a forward-thinking, all-encompassing solution would not be possible without the collegiality and cooperation of cardiac clinicians throughout the state. Such collaboration is enabled by the platform laid by QCOR and its focus on clinician engagement, supported by our colleagues at eHealth Queensland.

For the public and healthcare consumers, this report provides confidence that the quality and consistency of cardiac procedural care is routinely reported to providers, supporting continuous service improvement.

As the 2021 QCOR Annual Report is finalised, all that is left is to commend the tireless work of the collegiate network of healthcare professionals that continue to uphold the highest clinical standards. We express a sincere wish that the scope of QCOR's activities will be expanded for the benefit of more Queenslanders over many years to come.

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 Queensland 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, The Townsville 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 Anil Prabhu, The Prince Charles Hospital
- Dr Morgan Windsor, Metro North Hospital and Health Service
- Dr Sylvio Provenzano, Gold Coast University Hospital
- Dr Christopher Cole, Princess Alexandra Hospital (Chair)

QCOR Cardiac Rehabilitation Committee

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

Statewide Cardiac Clinical Informatics Unit

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

QCOR Electrophysiology and Pacing Committee

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- Vanessa Beattie, Gold Coast University Hospital
- Mr John Betts, The Prince Charles Hospital
- Mr Anthony Brown, Sunshine Coast University Hospital
- Mr Andrew Claughton, Princess Alexandra Hospital
- Dr Naresh Dayananda, Sunshine Coast University Hospital
- Dr Russell Denman, The Prince Charles Hospital
- Mr Braden Dinham, Gold Coast University Hospital
- Mr Nathan Engstrom, The Townsville Hospital
- A/Prof John Hill, Princess Alexandra Hospital
- Dr Paul Martin, Royal Brisbane & Women's Hospital
- Dr Caleb Mengel, Toowoomba Hospital
- Ms Sonya Naumann, Royal Brisbane & Women's Hospital
- Dr Sachin Nayyar, The Townsville Hospital
- Dr Kevin Ng, Cairns Hospital
- Dr Robert Park, Gold Coast University Hospital
- Mr Simon Townsend, The Prince Charles Hospital

QCOR Heart Failure Support Services Committee

- Mr Ben Shea, Redland Hospital
- Ms Angie Sutcliffe, Cairns Hospital
- Ms Deepali Gupta, Queen Elizabeth II Hospital
- Ms Helen Hannan, Rockhampton Hospital
- Ms Annabel Hickey, Statewide Heart Failure Services Coordinator
- Dr Rita Hwang, PhD, Princess Alexandra Hospital
- Ms Louvaine Wilson, Toowoomba Hospital
- Ms Melanie Burgess, Ipswich Hospital
- Ms Michelle Bertram, Gold Coast Hospital and Health Service
- Dr Wandy Chan, The Prince Charles Hospital
- Prof John Atherton, Royal Brisbane & Women's Hospital (Chair)

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 6, of the *Hospital and Health Boards Act 2011* 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.

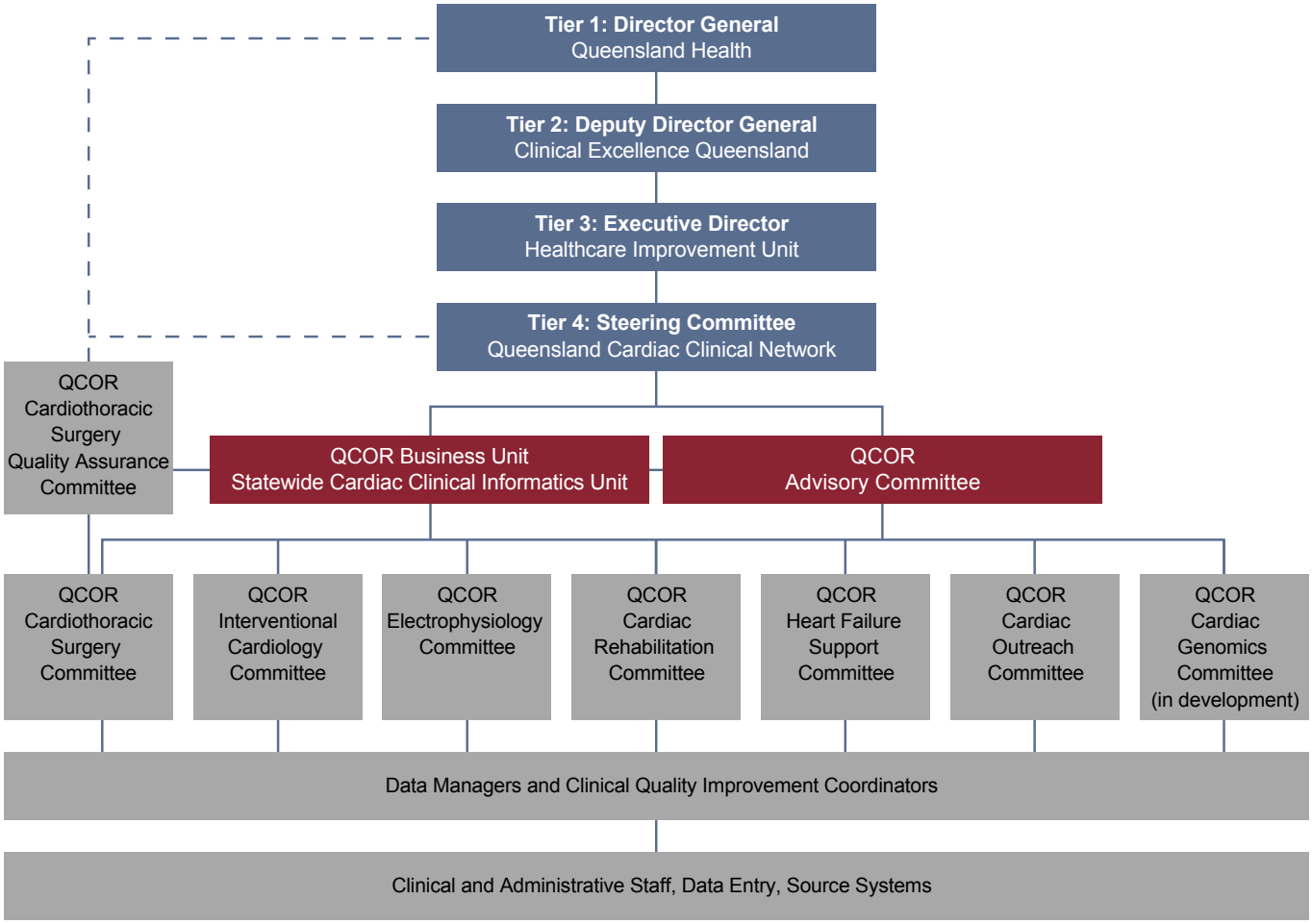


Figure 1: Governance structure

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 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.

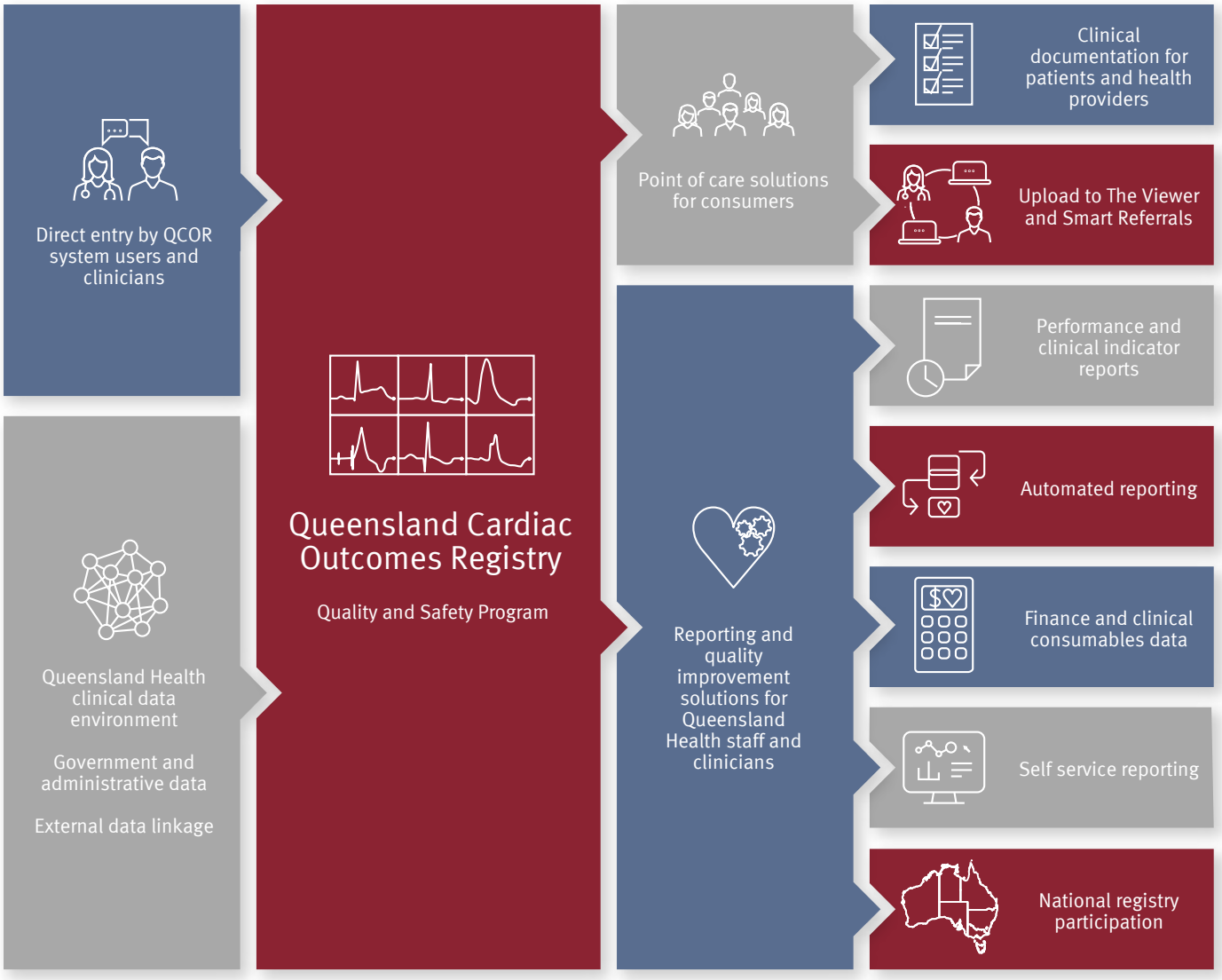
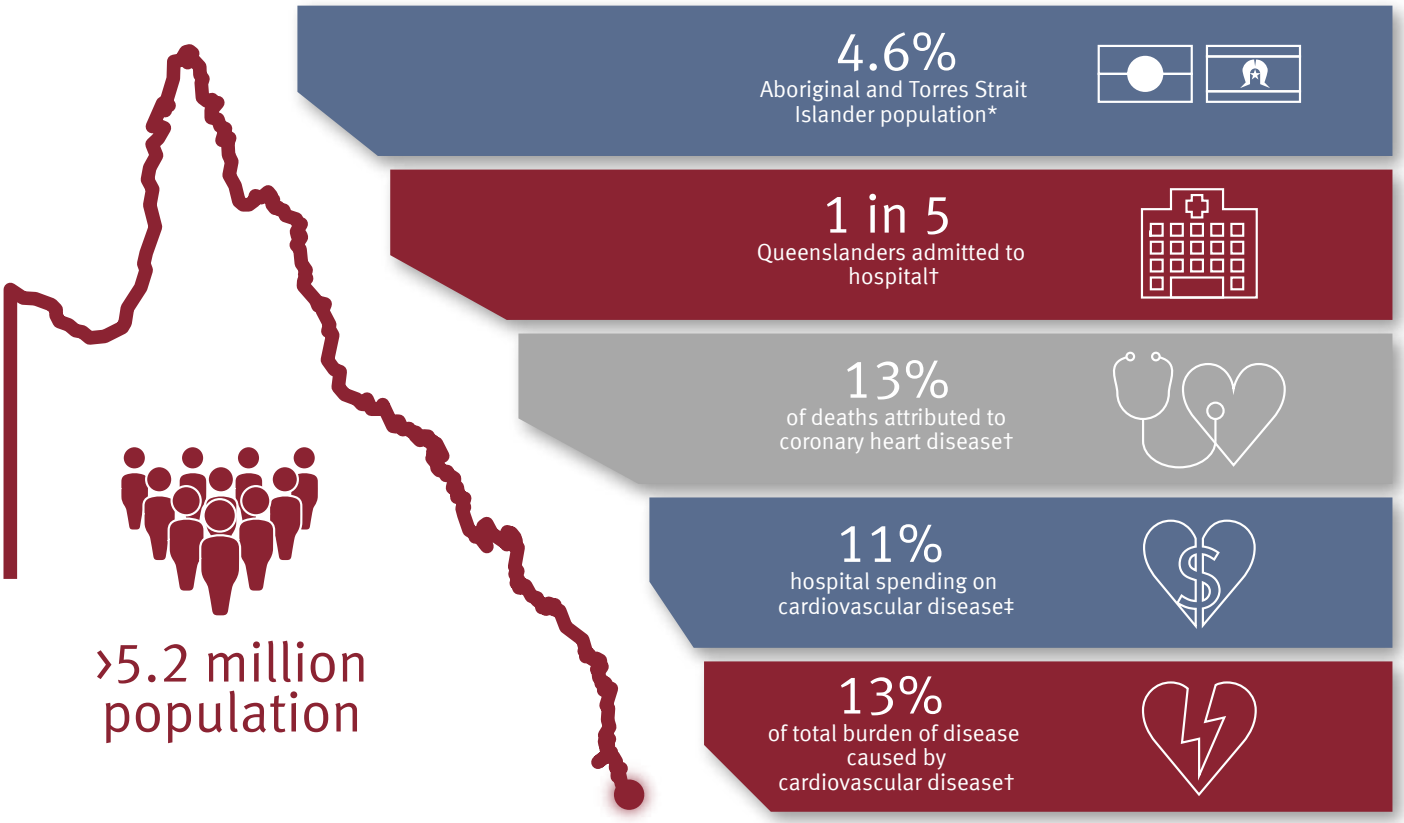


Figure 2: QCOR data flow

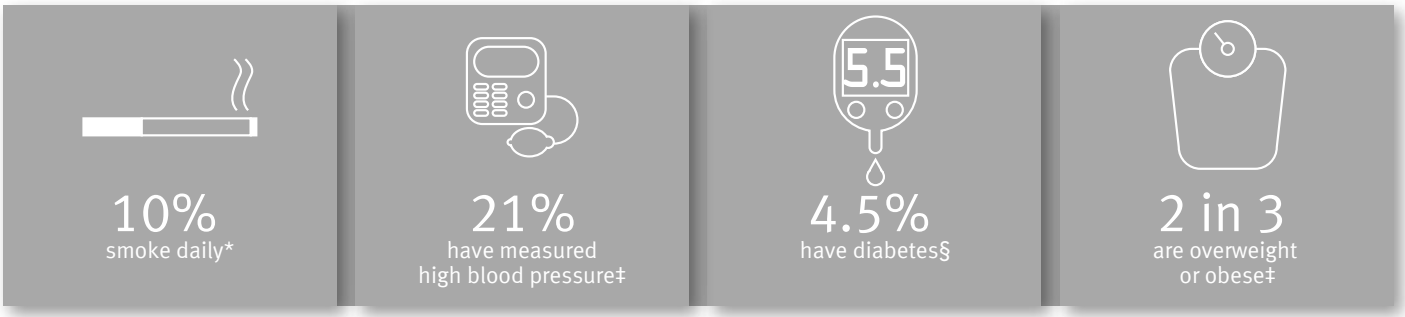
* The Australian Commission on Safety and Quality in Health Care (ACSQHC). Framework for Australian clinical quality registries. Sydney: ACSQHC; 2014.

Queensland Cardiac Outcomes Registry

The Health of Queenslanders



Comorbidities



Mortality

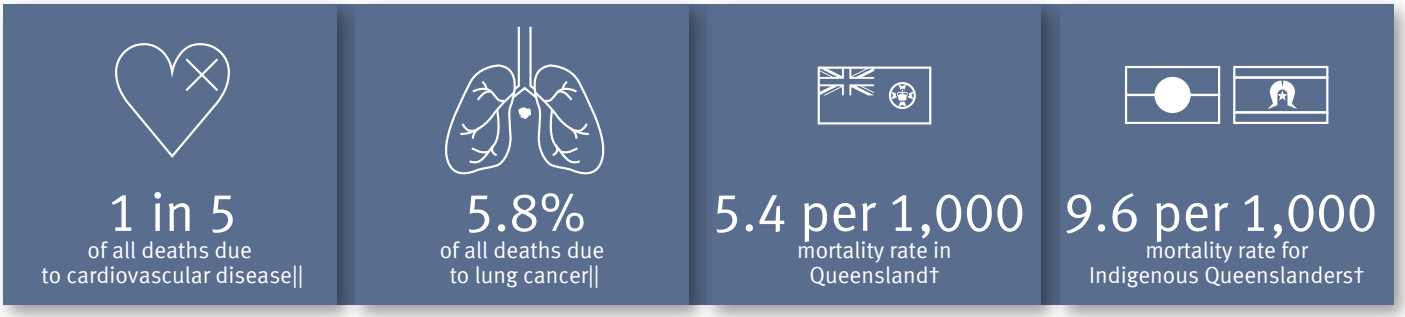


Figure 3: QCOR 2021 infographic

* 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

2021 Activity at a Glance

What's New?

- Cardiac surgery outcomes and mortality
- Cardiac genomics spotlight
- Cardiac surgery bleeding complications audit
- NSTEMI patients: Interhospital transfers analysis

Interventional Cardiology

4,894
percutaneous coronary interventions

485
structural heart disease interventions

239
transcatheter aortic valve replacements

15,443
total coronary procedures

Cardiothoracic Surgery

2,623
adult cardiac surgeries

1,067
adult thoracic surgeries

Electrophysiology & Pacing

5,269
electrophysiology and pacing procedures

3,500
cardiac implantable electronic device procedures

Heart Failure Support Services

6,326
heart failure support services referrals

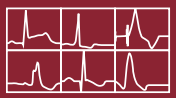
Cardiac Rehabilitation

10,647
cardiac rehabilitation referrals

Paediatric Cardiac Surgery

312
paediatric cardiac surgeries

Clinical Indicator Progress



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

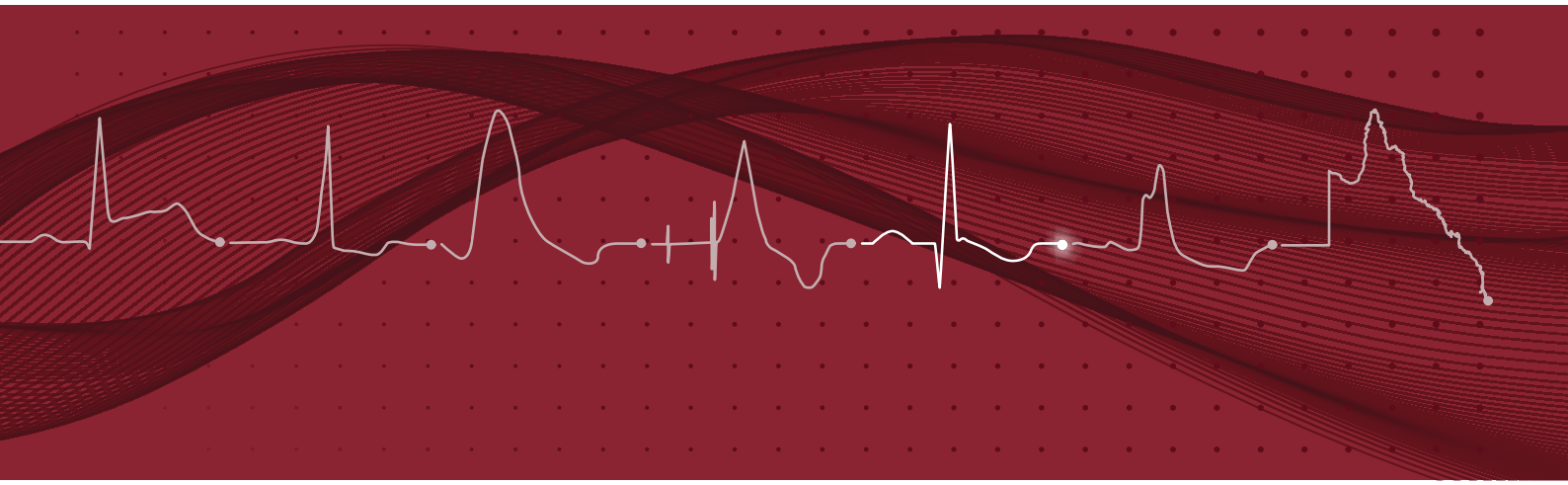
0.3%
procedural tamponade rate for cardiac device and electrophysiology procedures

91%
of patients referred to a heart failure support service on an ACEI, ARB or ARNI at discharge

93%
of cardiac rehabilitation referrals within 3 days of discharge

1.3%
mortality rate for coronary artery bypass surgery at 30 days

Cardiac Rehabilitation Audit



1 Introduction

The 2021 Annual Report for cardiac rehabilitation (CR) services in Queensland is the fifth report produced, which details the patient cohort that is receiving a referral to CR and the patient outcomes after program completion. Over five years, little variation to patient demographics, referral trends and timeliness of patient journey has been observed. This provides reassuring clarity about which patients are recipients of the many benefits CR provides. However, much can still be explored about how to engage those patients that are less likely to attend CR, particularly those from specific socioeconomic groups and geographic locations.

The effects of the global COVID-19 pandemic remained during 2021, with service delivery impacted by temporary closures of programs due to staff redeployment or the reclamation of gym spaces for other purposes. This is reflected in the reduction of the volume of patients attending a post-program six minute walk test compared to 2019, however a slight improvement on 2020, the time when statewide lockdowns and restrictions were implemented. Whilst 2021 experienced no sustained statewide lockdowns, a Public Health directive remained, restricting how CR outpatient programs were able to deliver their centre-based group programs.

A variety of models of care exist in Queensland to flexibly deliver CR to support patient goals and comply with Hospital and Health Service constraints. When reviewing patient outcomes, knowledge of local service delivery models is imperative to ensure appropriate context. The development of a system to capture model of care information at the time of data entry will allow the analysis of patient outcomes against model of care. It will also provide important information about preferred service delivery models. This update is planned for implementation in early 2023.

I would like to acknowledge the efforts of clinicians around Queensland to adapt to the continued pressures they face, and their dedication to delivering care to patients requiring CR.

Samara Phillips
Queensland Cardiac Rehabilitation CR Program Adviser

2 Key findings

This fifth 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 56 public cardiac rehabilitation (CR) sites that contributed data to QCOR.
- A total of 10,647 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 73% of referrals originated from an inpatient setting, while 14% of referrals originated from outside of Queensland Health.
- There were 7,341 referrals (69%) which proceeded to a pre assessment by CR. 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 71% 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 (55 years) and patients of other descent (66 years).
- The total proportion of Aboriginal and Torres Strait Islander patients was 6.6%. Large geographical variance was noted, with sites in North Queensland having a significantly higher proportion of Aboriginal and Torres Strait Islander patients.
- Overall, 66% of referrals had a pre assessment diagnosis of ischaemic heart disease.
- At pre assessment, 81% of patients were classed as having an unhealthy body mass index (BMI) including 38% classed as overweight, 36% obese and 6% morbidly obese.
- The most common procedure undergone by patients who attended a CR pre assessment was a percutaneous coronary intervention, which had been performed for 41% of patients. There were 18% of patients who had undergone coronary artery bypass grafting.
- Only 38% 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 93% of cases.
- A timely overall journey occurred in 59% of cases (Queensland Health inpatients referred within 3 days of discharge and assessed by CR program within 28 days of discharge).
- 42% of patients who completed a pre assessment continued CR to the completion of a post assessment.
- The majority of patients completing a post assessment reported an improved health status following completion of CR, regardless of which measure was used.

3 Participating sites

Table 1: Participating CR sites

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

HHS/Organisation	CR program	Locations	2019	2020	2021
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	⊘	○	○
	Stanthorpe Health CR Program	Stanthorpe	○	○	○
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	⊘	⊘	⊘
	TPCH Cardiac Rehabilitation Service*	The Prince Charles Hospital§	–	⊘	N/A
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	◑	○	○
	Charters Towers CR	Charters Towers	◑	◑	N/A
	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)
§ Temporary service as part Metro North HHS COVID-19 response
N/A Existing service ceased operations

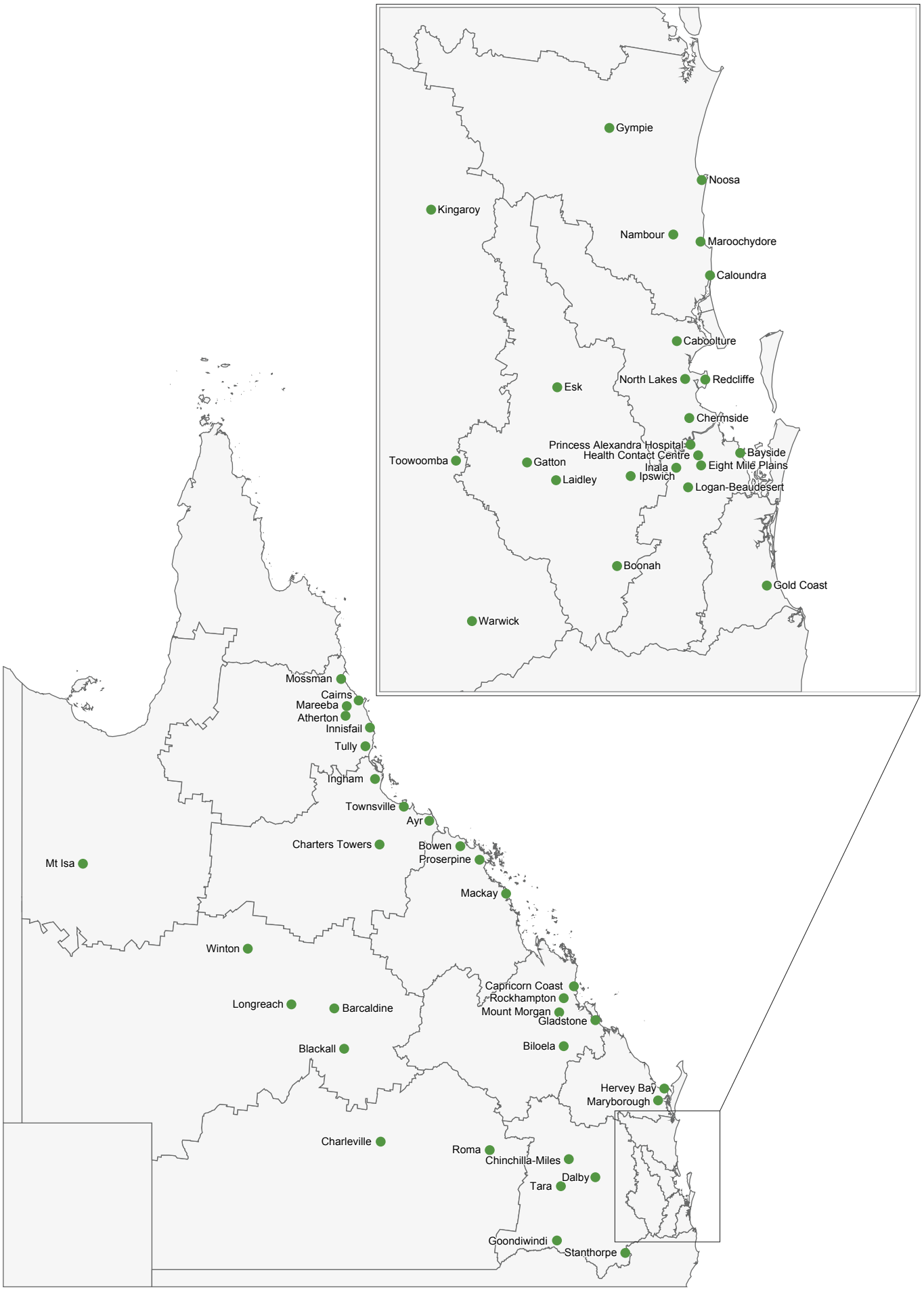


Figure 1: Map of Queensland public CR sites

4 Total referrals

4.1 Statewide

The volume of cardiac rehabilitation (CR) referrals entered into the QCOR clinical application expanded through 2021 to include an additional 10,647 new referrals for the calendar year. This brings the overall total to over 50,000 referrals since data collection commenced in July 2017.

Clinicians at 56 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 or was unsuitable to participate in CR. This has increased the availability of data, allowing these cases to be examined in more detail.

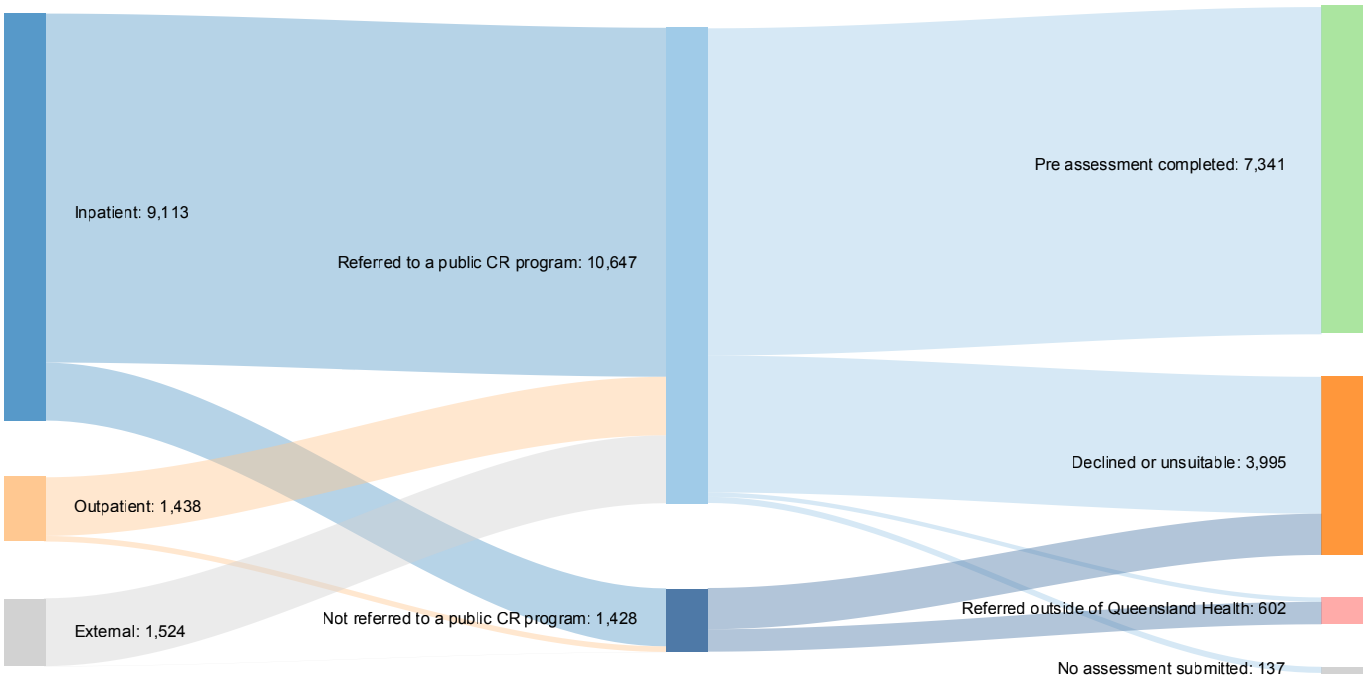


Figure 2: Statewide cardiac rehabilitation referrals flow

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.

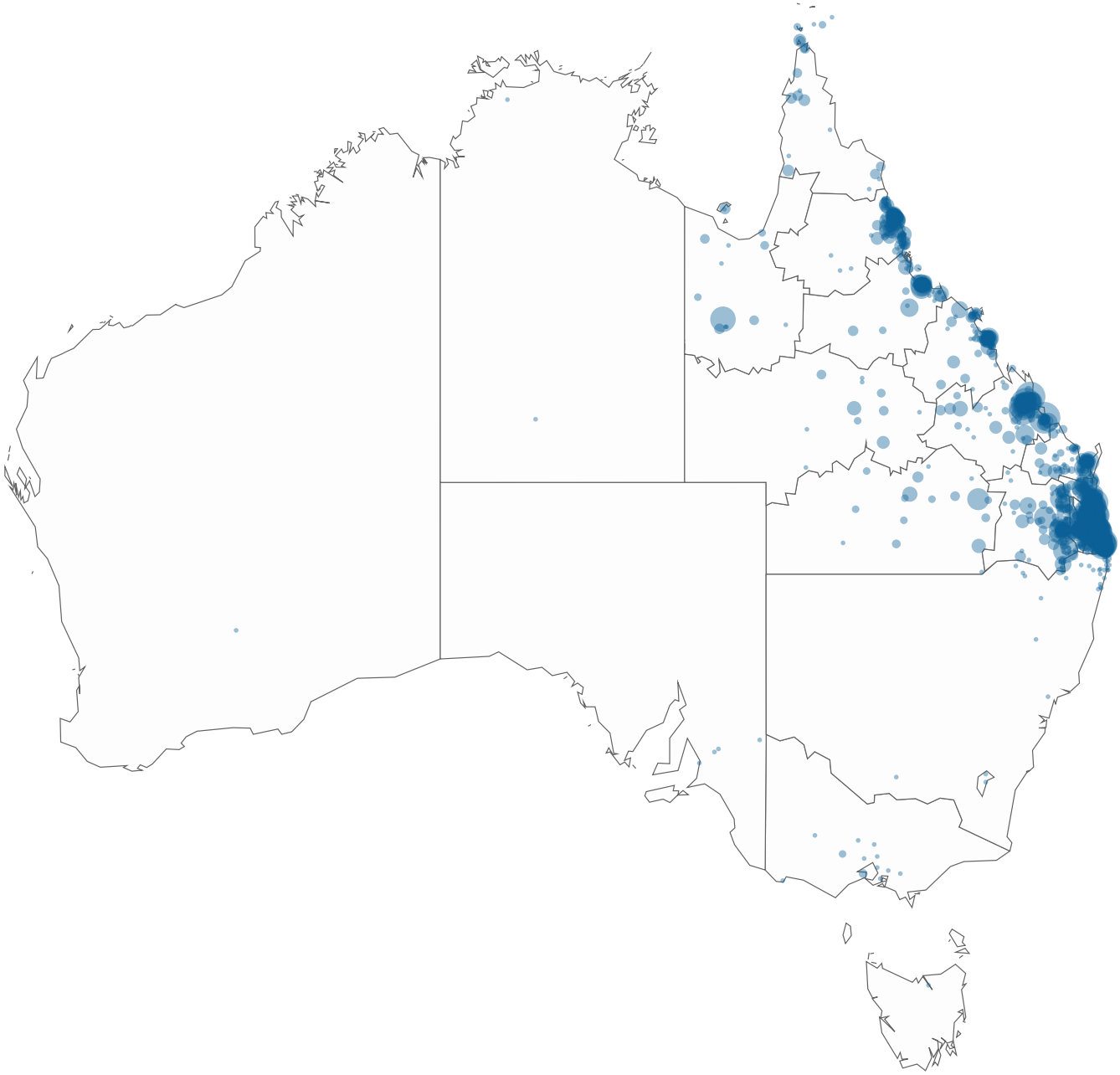


Figure 3: Distribution of CR referrals by usual place of residence

Table 2: Proportion of CR referrals by remoteness classification

Remoteness area*	**%**
Major Cities of Australia	54.8
Inner Regional Australia	26.5
Outer Regional Australia	15.3
Remote Australia	1.3
Very Remote Australia	2.1
ALL	**100.0**

Excludes missing data (0.3%)

* Classified by Australian Statistical Geography Standard remoteness area

4.2 Origin of referrals

The majority of referrals (73%) originated from an inpatient setting, with smaller proportions of referrals flowing to CR from an outpatient setting (12%) and outside of Queensland Health (14%).

There was considerable variation across participating CR programs in the proportion of referrals from external sources, which ranged from <1% to 26%. It is possible that not all sites are entering referrals received from general practitioners, private hospitals or external specialists.

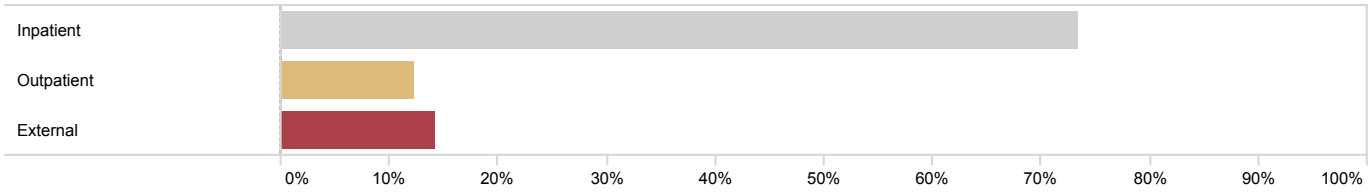


Figure 4: Proportion of referrals by referral source

Table 3: Referral sources by outpatient program HHS

HHS/division	Total referrals n	Inpatient* n (%)	Outpatient* n (%)	External n (%)
Cairns and Hinterland	685	595 (86.9)	51 (7.4)	39 (5.7)
Central Queensland	958	507 (52.9)	210 (21.9)	241 (25.2)
Central West	32	18 (56.3)	14 (43.8)	–
Darling Downs	570	364 (63.9)	95 (16.7)	111 (19.5)
Gold Coast	1,370	1,195 (87.2)	97 (7.1)	78 (5.7)
Health Contact Centre	1,103	899 (81.5)	126 (11.4)	78 (7.1)
Mackay	306	190 (62.1)	96 (31.4)	20 (6.5)
Metro North	1,470	1,066 (72.5)	148 (10.1)	256 (17.4)
Metro South	1,710	1,139 (66.6)	121 (7.1)	450 (26.3)
North West	62	36 (58.1)	19 (30.6)	7 (11.3)
South West	81	35 (43.2)	44 (54.3)	2 (2.5)
Sunshine Coast	967	853 (88.2)	61 (6.3)	53 (5.5)
Townsville	421	348 (82.7)	72 (17.1)	1 (0.2)
West Moreton	681	380 (55.8)	125 (18.4)	176 (25.8)
Wide Bay	231	190 (82.3)	34 (14.7)	7 (3.0)
Statewide	**10,647**	**7,815 (73.4)**	**1,313 (12.3)**	**1,519 (14.3)**

* Includes referrals from a Queensland Health public facility

More than half of all patients were residing in major cities (55%), and the remainder in regional and remote areas of Queensland. This is consistent with the decentralised distribution of the population within the state.

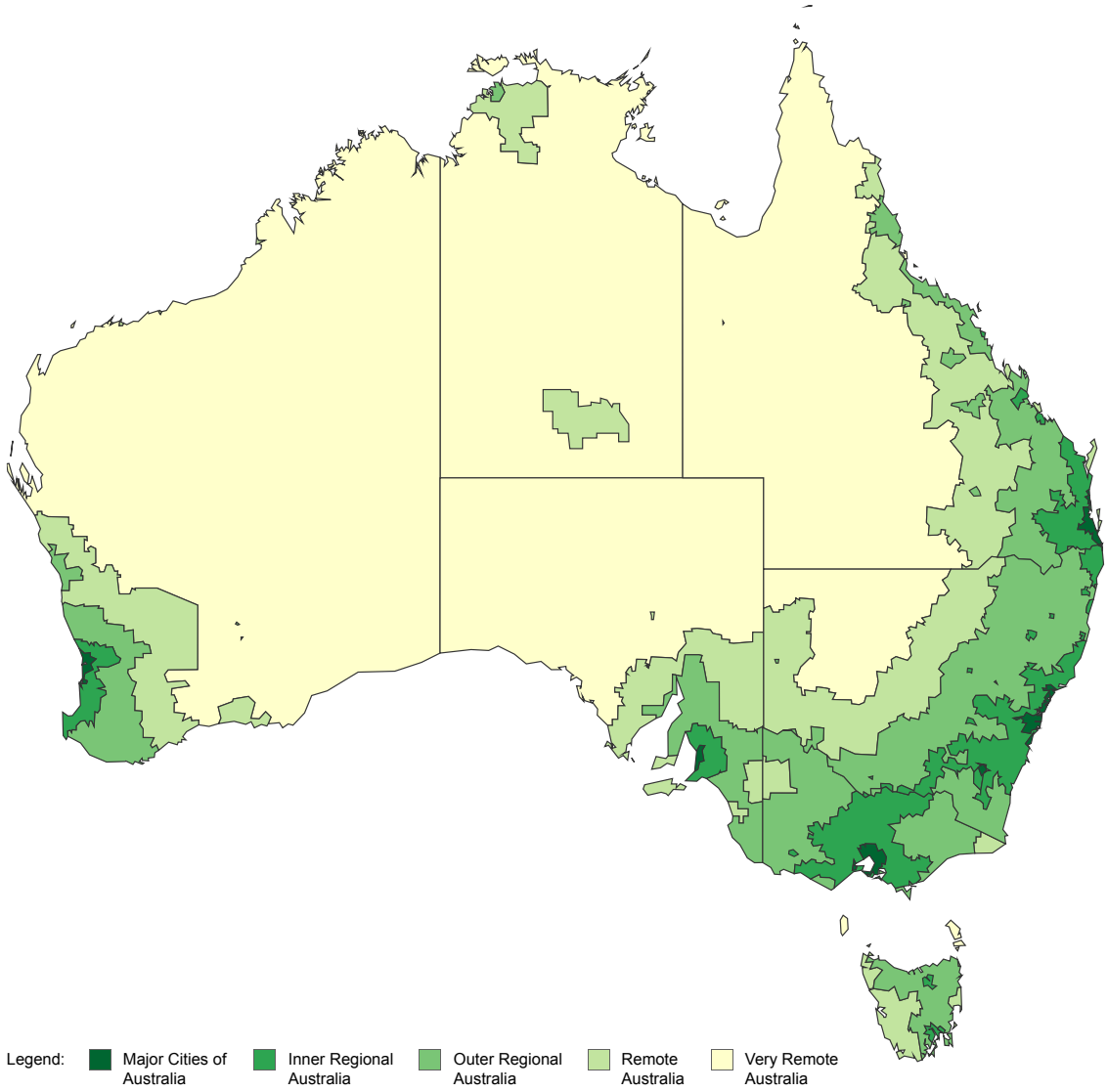


Figure 5: Australian Statistical Geography Standard remoteness areas

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

HHS/organisation	Major Cities n (%)	Inner Regional n (%)	Outer Regional n (%)	Remote n (%)	Very Remote n (%)
Cairns and Hinterland	1 (0.1)	1 (0.1)	604 (90.0)	23 (3.4)	42 (6.3)
Central Queensland	1 (0.1)	872 (91.0)	73 (7.6)	12 (1.3)	–
Central West	–	–	1 (3.1)	–	31 (96.9)
Darling Downs	8 (1.4)	434 (76.1)	126 (22.1)	1 (0.2)	1 (0.2)
Gold Coast	1,310 (96.0)	53 (3.9)	2 (0.1)	–	–
Health Contact Centre	565 (51.6)	240 (21.9)	179 (16.3)	55 (5.0)	56 (5.1)
Mackay	–	174 (56.9)	123 (40.2)	9 (2.9)	–
Metro North	1,292 (88.0)	173 (11.8)	2 (0.1)	–	1 (0.1)
Metro South	1,567 (91.9)	113 (6.6)	16 (0.9)	10 (0.6)	–
North West	–	–	1 (1.6)	2 (3.2)	59 (95.2)
South West	–	–	35 (43.2)	18 (22.2)	28 (34.6)
Sunshine Coast	615 (63.7)	344 (35.6)	6 (0.6)	–	–
Townsville	3 (0.7)	1 (0.2)	405 (96.2)	6 (1.4)	6 (1.4)
West Moreton	451 (66.3)	227 (33.4)	2 (0.3)	–	–
Wide Bay	–	184 (79.7)	47 (20.3)	–	–
Statewide	**5,813 (54.8)**	**2,816 (26.5)**	**1,622 (15.3)**	**136 (1.3)**	**224 (2.1)**

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. Gold Coast HHS and Metro South HHS received the largest volumes of inpatient referrals (15% each).

Table 5: CR inpatient referrals by source and destination HHS

HHS/organisation	Outgoing inpatient referrals n (%)	Incoming inpatient referrals n (%)
Cairns and Hinterland	542 (6.9)	595 (7.6)
Central Queensland	290 (3.7)	507 (6.5)
Central West	–	18 (0.2)
Darling Downs	145 (1.9)	364 (4.7)
Gold Coast	1,208 (15.5)	1,195 (15.3)
Health Contact Centre	–	899 (11.5)
Mackay	124 (1.6)	190 (2.4)
Mater Health Services	69 (0.9)	–
Metro North	2,136 (27.3)	1,066 (13.6)
Metro South	1,776 (22.7)	1,139 (14.6)
North West	1 (<0.1)	36 (0.5)
South West	–	35 (0.4)
Sunshine Coast	733 (9.4)	853 (10.9)
Townsville	637 (8.1)	348 (4.5)
West Moreton	123 (1.6)	381 (4.9)
Wide Bay	31 (0.4)	190 (2.4)
Statewide	**7,815 (100.0)**	**7,815 (100.0)**

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.

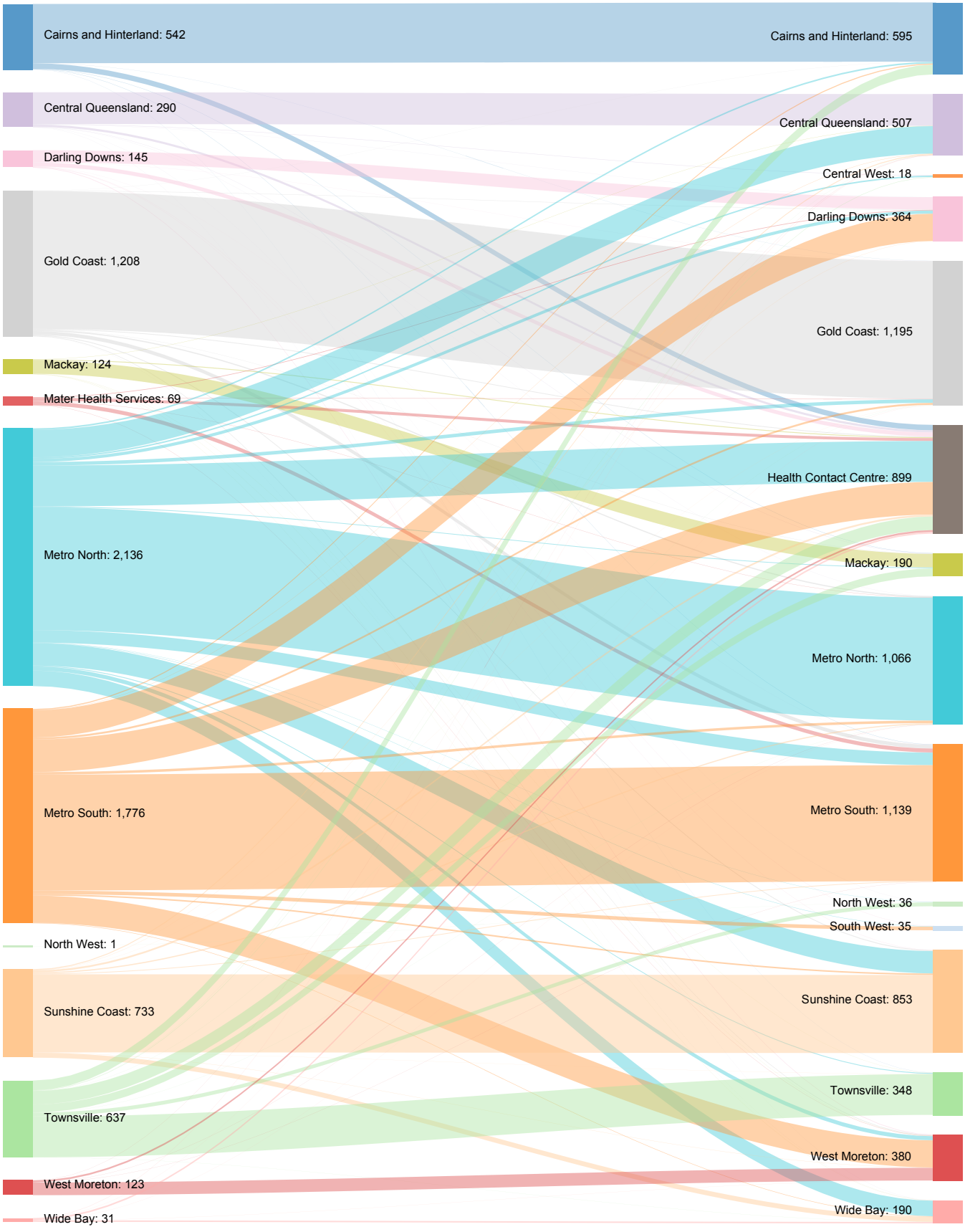


Figure 6: CR inpatient referrals by source and destination HHS

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 5: 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	529 (77.2)	156 (22.8)	–
Central Queensland	666 (69.5)	291 (30.4)	1 (0.1)
Central West	28 (87.5)	4 (12.5)	–
Darling Downs	369 (64.7)	181 (31.8)	20 (3.5)
Gold Coast	1,026 (74.9)	344 (25.1)	–
Health Contact Centre	786 (71.3)	317 (28.7)	–
Mackay	173 (56.5)	84 (27.5)	49 (16.0)
Metro North	1,043 (71.0)	427 (29.0)	–
Metro South	1,222 (71.5)	488 (28.5)	–
North West	44 (71.0)	18 (29.0)	–
South West	70 (86.4)	11 (13.6)	–
Sunshine Coast	533 (55.1)	434 (44.9)	–
Townsville	198 (47.0)	171 (40.6)	52 (12.4)
West Moreton	467 (68.6)	199 (29.2)	15 (2.2)
Wide Bay	187 (81.0)	44 (19.0)	–
Statewide	**7,341 (68.9)**	**3,169 (29.8)**	**137 (1.3)**

* Referrals to Gold Coast HHS include 11% patients residing interstate, typically referred on for CR outside of Queensland Health

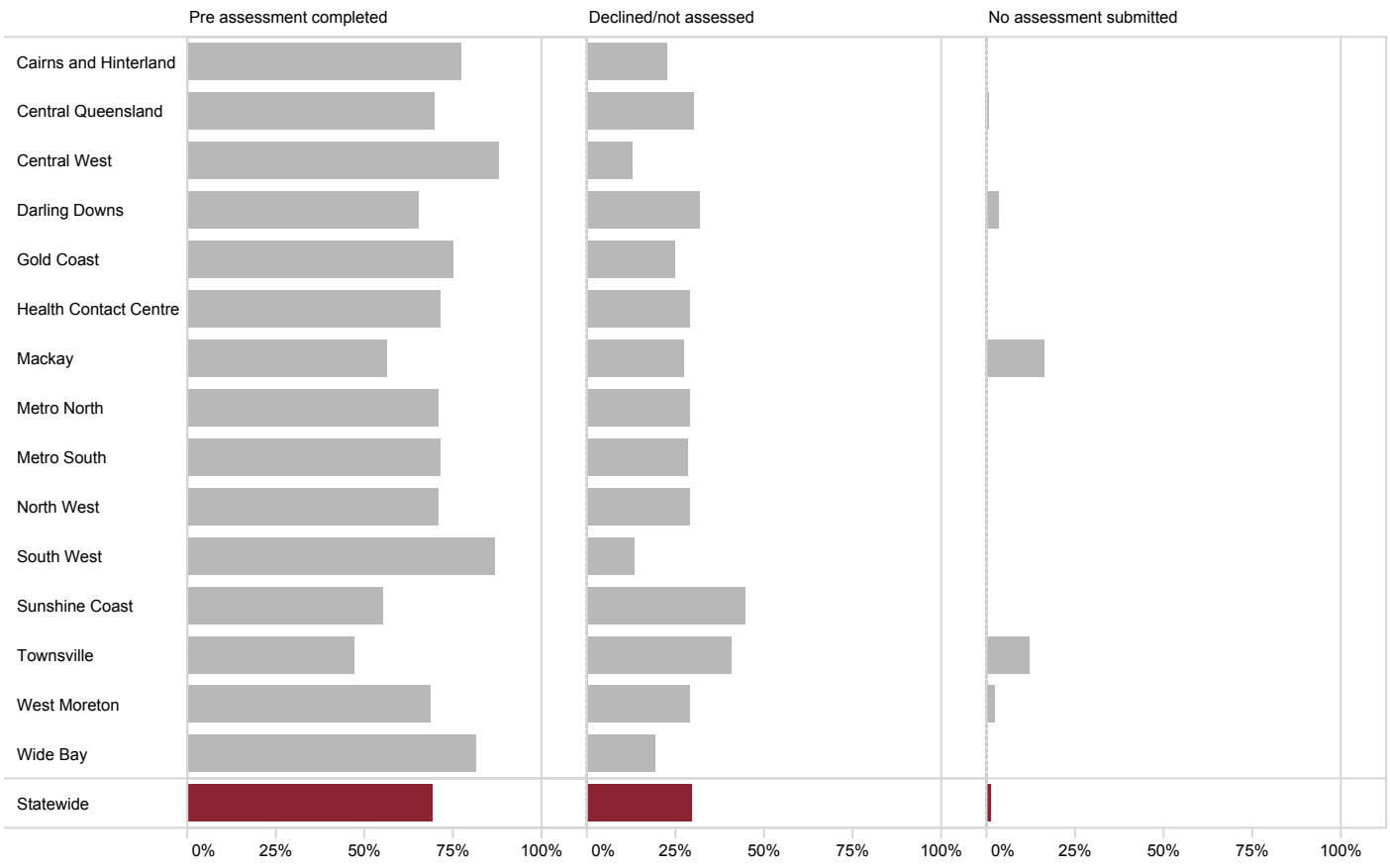


Figure 7: Proportion of CR referrals proceeding to pre assessment by outpatient HHS/division

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 7,341 completed pre assessments, 42% proceeded to post assessment which compares similarly to the previous year.

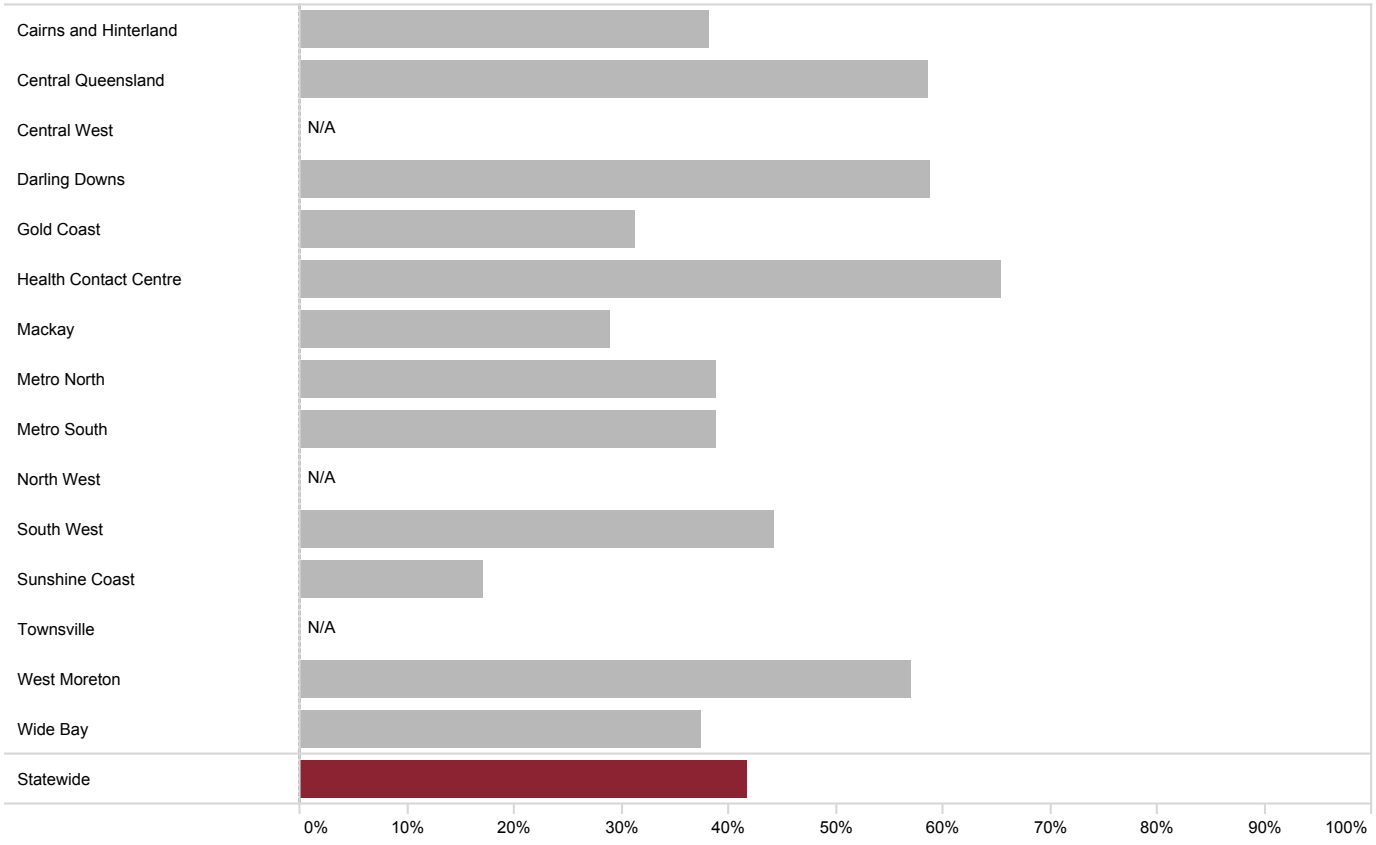
Completion rates and median time interval from pre assessment to post assessment varied considerably by HHS. The median time from pre assessment to post assessment was 81 days, with a range of 53 days to 149 days across outpatient HHS. There was considerable variation in the proportion of cases where 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. Reasons for non-participation in the post assessment presents an opportunity for investigation in the future.

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

Table 6: Total post assessments completed by HHS

Outpatient HHS/division	Post assessment completed n (%)	Median time to post assessment days
Cairns and Hinterland	202 (38.2)	63
Central Queensland	391 (58.7)	70
Central West	1 (3.6)	N/A
Darling Downs	217 (58.8)	56
Gold Coast	320 (31.2)	57
Health Contact Centre	514 (65.4)	149
Mackay	50 (28.9)	80
Metro North	406 (38.9)	103
Metro South	474 (38.8)	73
North West	9 (20.5)	N/A
South West	31 (44.3)	88
Sunshine Coast	91 (17.1)	145
Townsville	19 (9.6)	N/A
West Moreton	267 (57.2)	61
Wide Bay	70 (37.4)	53
Statewide	**3,062 (41.7)**	**81**

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

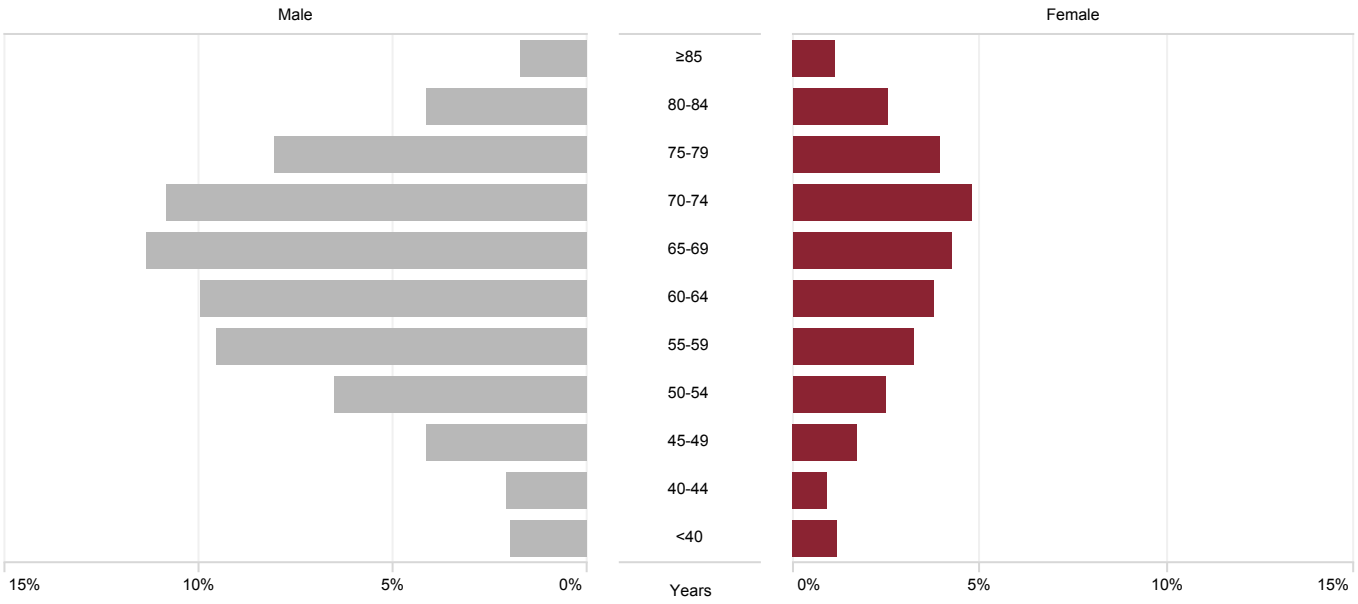
6 Patient characteristics

The following analysis examines the characteristics of the 10,647 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, 71% of patients were male and 29% female. The age distribution of referrals was similar for genders, though the median age for males was slightly lower than for females (65 years vs. 67 years).

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



% of total referrals (n=10,647)

Figure 9: Referrals by patient gender and age group

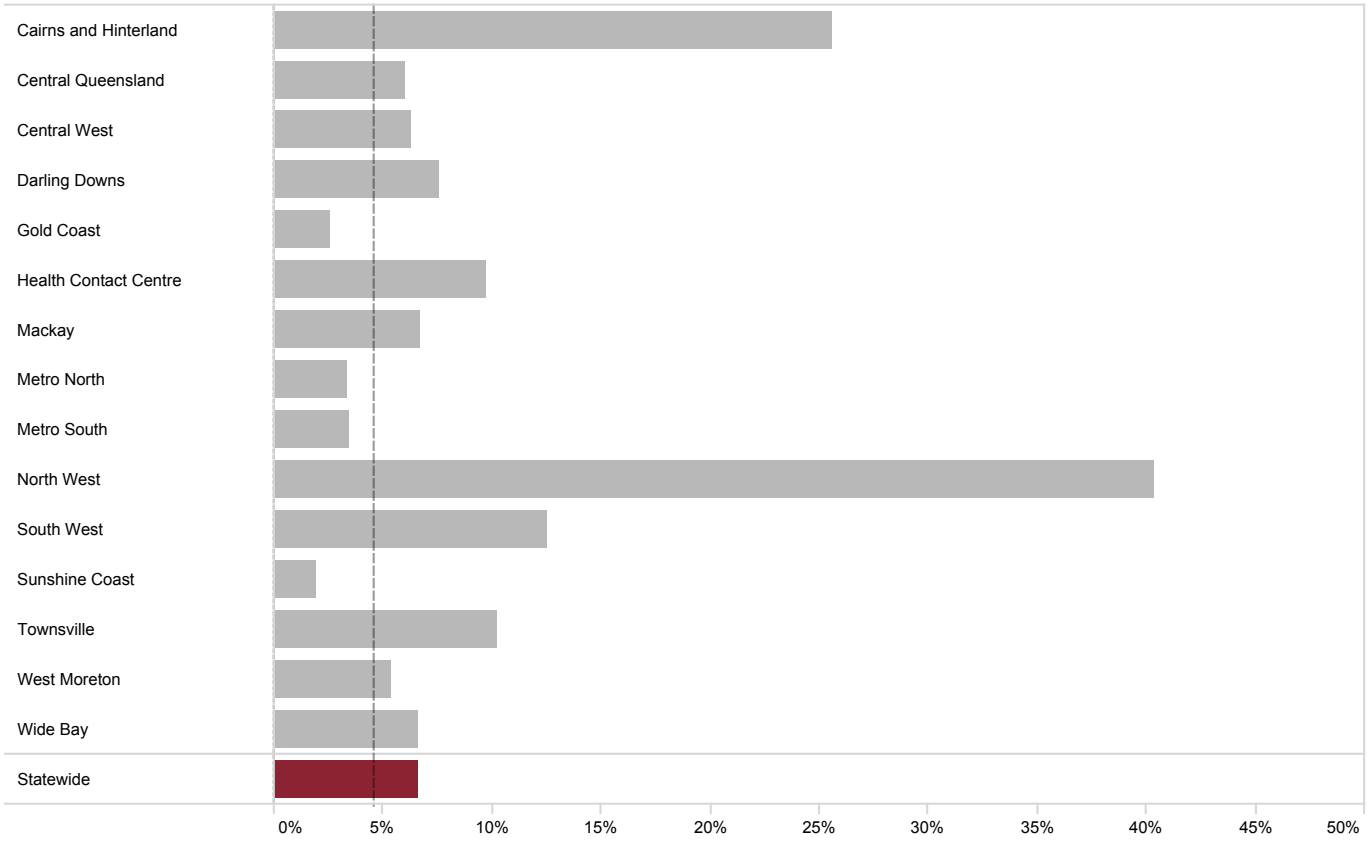
Table 8: Median patient age by gender and HHS

Outpatient HHS/division	Male years	Female years	All years
Cairns and Hinterland	64	63	64
Central Queensland	67	68	68
Central West	66	72	67
Darling Downs	67	66	67
Gold Coast	66	69	67
Health Contact Centre	64	66	64
Mackay	64	68	65
Metro North	67	68	67
Metro South	64	66	65
North West	60	59	60
South West	65	68	66
Sunshine Coast	68	70	68
Townsville	62	61	62
West Moreton	64	67	64
Wide Bay	66	69	67
Statewide	**65**	**67**	**66**

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.[47]

In this cohort, Aboriginal and Torres Strait Islander patients represent 6.6% 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]

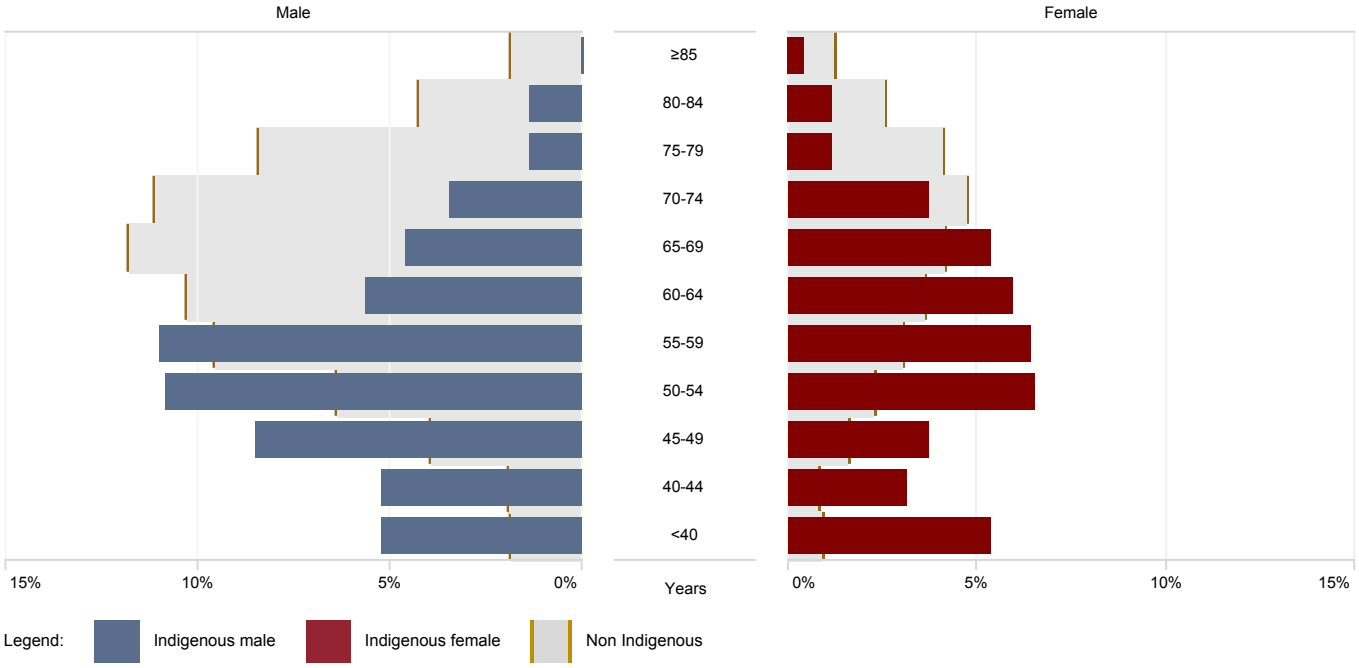


Excludes missing data (4.1%)

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 (55 years vs. 66 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	Total years
Aboriginal and Torres Strait Islander	55	58	55
Non Aboriginal and Torres Strait Islander	66	68	66
All	**65**	**67**	**66**

Excludes missing data 4.1%

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 (66%) followed a previous diagnosis of ischaemic heart disease (IHD).

Table 9: Pre assessments by diagnosis category

Diagnosis category	n	%
Ischaemic heart disease*	4,833	65.9
Valvular disease	605	8.2
Other†	1,903	25.9
All	**7,341**	**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 41% of all referrals and 56% 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	2,718 (56.2)	4 (0.7)	299 (15.7)	3,021 (41.2)
Coronary angiogram	772 (16.0)	10 (1.7)	282 (14.8)	1,064 (14.5)
CABG	844 (17.5)	12 (2.0)	320 (16.8)	1,176 (16.0)
Valve procedure	13 (0.3)	481 (79.5)	163 (8.6)	657 (8.9)
Device procedure	6 (0.1)	2 (0.3)	137 (7.2)	145 (2.0)
CABG + valve procedure	61 (1.3)	61 (10.1)	42 (2.2)	164 (2.2)
Other	30 (0.6)	13 (2.1)	206 (10.8)	249 (3.4)
Not specified	389 (8.0)	22 (3.6)	454 (23.9)	865 (11.8)

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 (90%) had a history of abnormal cholesterol levels or had been prescribed lipid lowering therapy at the time of assessment. This ranged from 66% to 96% across diagnosis categories.
- Only 38% of patients met the physical activity guidelines for their age and were sufficiently active. Furthermore, 21% 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 less than one fifth (19%) 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 16% of patients assessed by outpatient CR who were documented as having heart failure.
- Of the patients documented to have heart failure, 86% were classed as having a reduced ejection fraction (LVEF <50%).
- Over one quarter (27%) of patients had a documented history of depression.
- More than half of patients (59%) were identified as having a history of hypertension.
- There were 12% of patients identified as current smokers (defined as smoking within 30 days), while 48% were classed as former smokers.

Table 12: Summary of risk factors by diagnosis category

Risk factor	Ischaemic heart disease %	Valvular disease %	Other %	All %
Abnormal cholesterol*	96.4	65.5	80.4	89.7
Activity level				
Sufficiently active	38.7	40.1	35.2	37.9
Insufficiently active	40.9	39.2	43.7	41.5
Inactive	20.4	20.7	21.1	20.6
Body mass index				
Normal range†	17.8	24.9	19.0	18.7
Overweight‡	39.1	36.7	35.9	38.1
Obese§	37.0	32.8	34.4	36.0
Morbidly obese‖	5.4	3.5	9.7	6.3
Diabetes	27.9	19.5	25.1	26.5
Family history of CVD#	48.9	33.2	42.9	46.0
Heart failure	12.6	11.2	24.0	15.5
Heart failure, LVEF**				
≥50%	6.1	31.8	23.1	14.4
40–49%	40.8	25.8	26.7	34.3
30–39%	40.4	25.8	27.8	34.6
‹30%	12.6	16.7	22.4	16.7
History of depression	27.0	25.1	28.5	27.2
Hypertension	57.9	56.6	61.5	58.7
Smoking status				
Current smoker††	15.2	3.8	7.5	12.2
Former smoker	49.2	46.0	45.9	48.1
Never smoked	35.7	50.3	46.7	39.7

% 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 (84%). 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.

Table 13: Current medications by diagnosis category

Medications	IHD %	Valvular disease %	Other %	All %
Aspirin	90.8	67.1	66.8	82.6
ACEI/ARB*	65.4	44.6	54.7	60.9
Antiplatelet	69.7	9.5	30.8	54.7
Anticoagulant	15.7	46.1	25.5	20.7
Beta blocker	68.0	53.9	58.6	64.4
Diabetic medications	24.4	17.4	22.0	23.2
Dual antiplatelet	65.4	5.7	24.5	49.9
Lipid lowering	92.3	57.3	73.1	84.4
Sublingual nitrate	62.3	5.5	21.1	47.0
Other	69.5	85.3	79.1	73.3

* Angiotensin converting enzyme inhibitor/angiotensin receptor blocker

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 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.

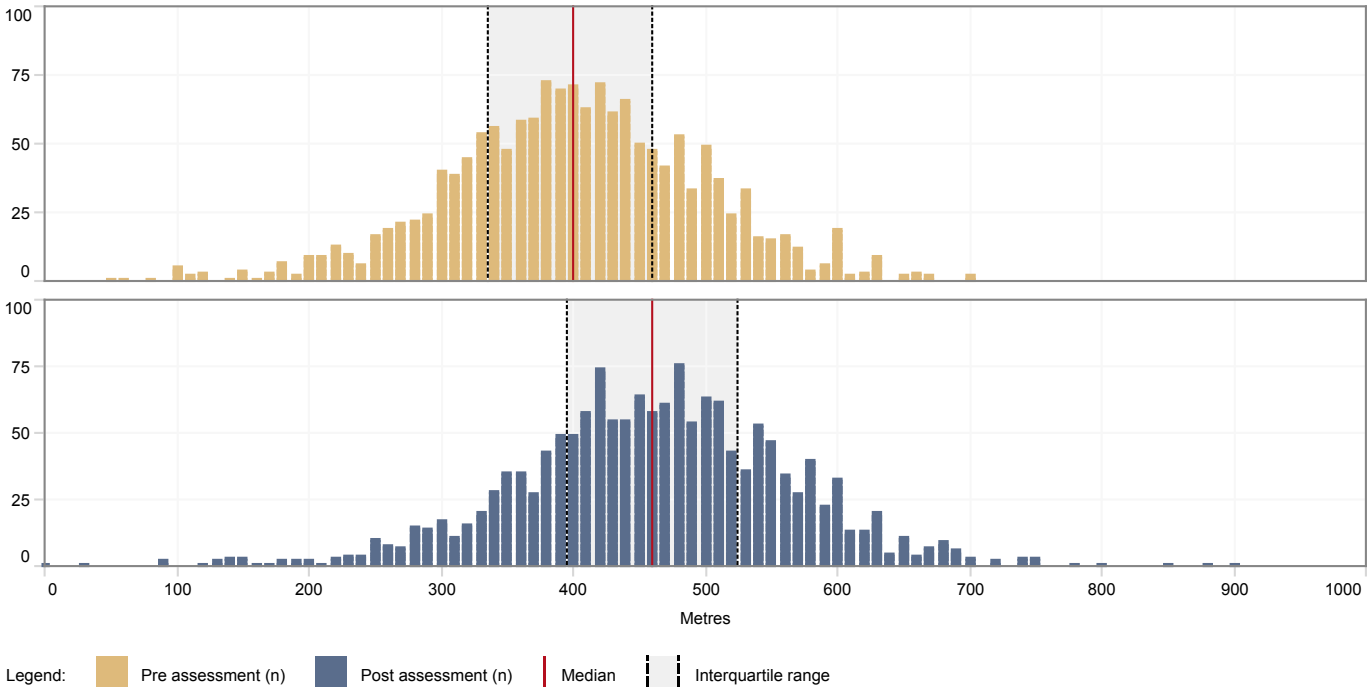
Table 15: Summary of lipid values

	Total analysed n	Pre assessment Mean ± SD	Post assessment Mean ± SD	Change in value Mean ± SD
Total cholesterol (mmol/L)	326	4.5 ± 1.3	3.5 ± 0.8	-1.0 ± 1.3
Triglycerides (mmol/L)	306	1.9 ± 1.1	1.5 ± 0.8	-0.3 ± 1.0
HDL-C (mmol/L)	284	1.1 ± 0.6	1.1 ± 0.3	-0.1 ± 0.6
LDL-C (mmol/L)	278	2.5 ± 1.1	1.6 ± 0.6	-0.9 ± 1.1

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.[48]

There were 1,537 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. In the majority of instances (74%) patients demonstrated an improvement in 6MWT, with 56% recording an increase of greater than 50 metres (Table 16).



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)	1,537	398.0 ± 96.2	458.0 ± 104.3	59.9 ± 59.5

Table 17: Change in six minute walk test results

	n (%)
Improved ≥50 metres	856 (55.7)
Improved 26–49 metres	279 (18.2)
No change (±25 metres)	339 (22.1)
Worsened >25 metres	63 (4.1)
All	**1,537 (100.0)**

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.[49] This instrument is a four item composite measure derived from the Generalized 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 2,343 paired data were available for analysis. One third of patients (33%) demonstrated an improved PHQ-4 score at post assessment and 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.

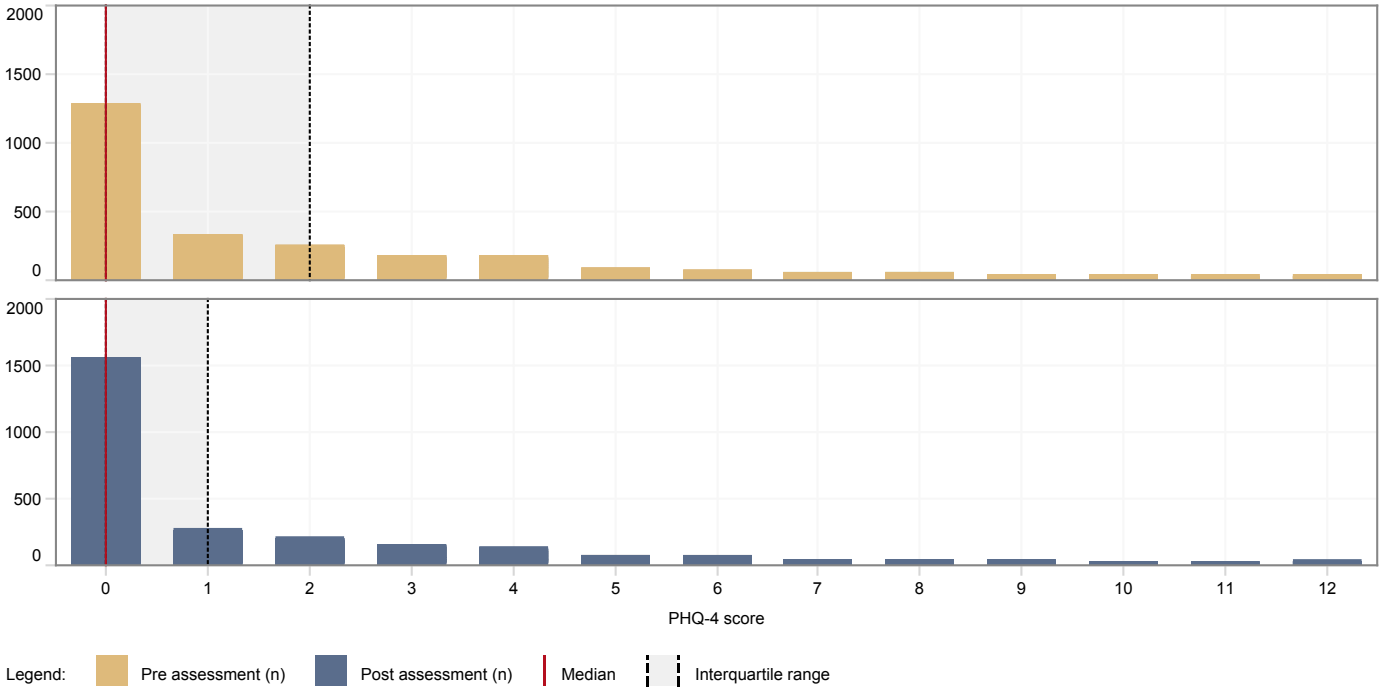


Figure 13: Comparison of pre assessment and post assessment PHQ-4 results

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)	2,343	0.7 ± 1.2	0.4 ± 1.0	-0.2 ± 1.2
Anxiety score (GAD-2)	2,343	0.8 ± 1.3	0.6 ± 1.1	-0.2 ± 1.3
Overall score	**2,343**	**1.5 ± 2.3**	**1.0 ± 1.9**	**-0.5 ± 2.1**

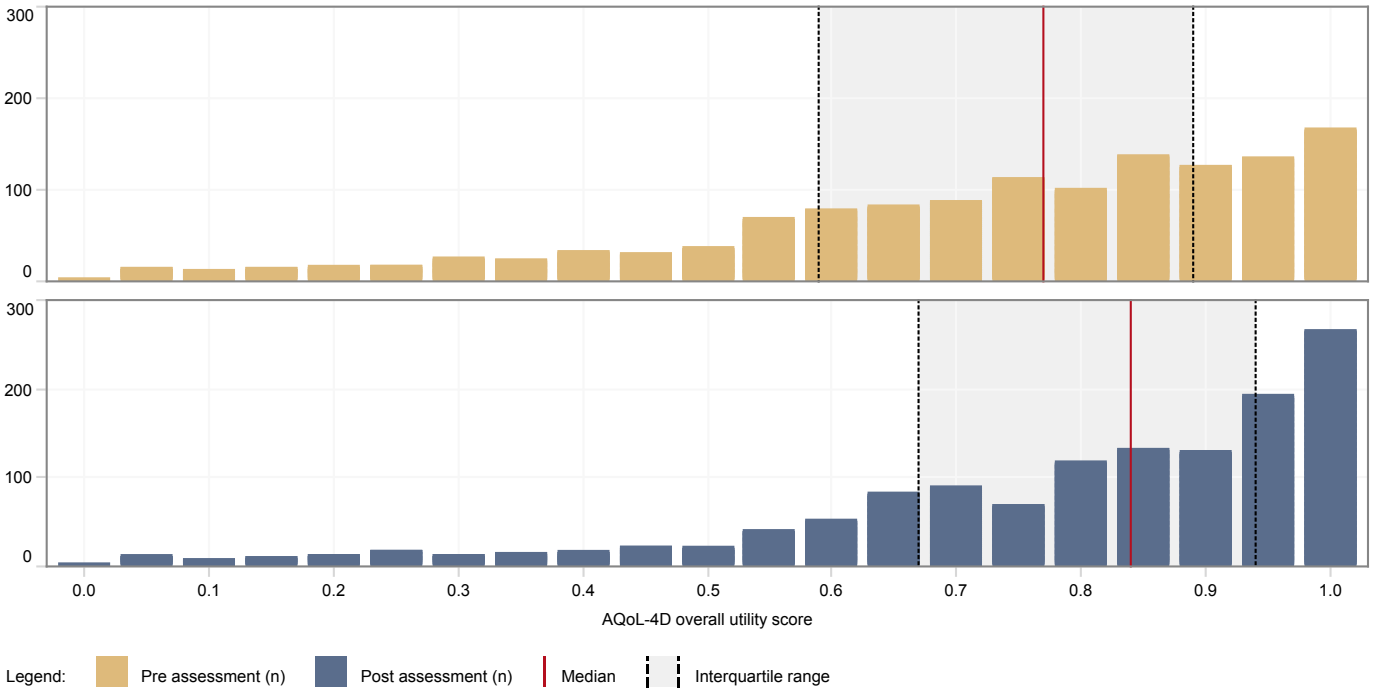
Table 19: Change in PHQ-4 results

	n (%)
Any improvement	783 (33.4)
No change	1207 (51.5)
Any worse result	353 (15.1)
All	**2,343 (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 1,258 records available at the pre and post CR timeframes, the mean overall pre assessment AQoL-4D utility score was 0.72 which compares similarly to expected results for patients with a cardiovascular diagnosis.[50] This utility score improved to 0.78 at the post assessment stage, where 59% of patients demonstrated an improved overall utility score after CR intervention (Table 20 and Table 21).



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	1,258	0.90 ± 0.18	0.95 ± 0.13	0.05 ± 0.16
Relationships	1,258	0.91 ± 0.15	0.92 ± 0.15	0.01 ± 0.15
Senses	1,258	0.94 ± 0.07	0.94 ± 0.07	0.01 ± 0.07
Mental health	1,258	0.90 ± 0.11	0.91 ± 0.11	0.02 ± 0.12
Overall score	**1,258**	**0.72 ± 0.23**	**0.78 ± 0.21**	**0.06 ± 0.21**

Table 21: Change in AQoL-4D results

	n (%)
Any improvement	737 (58.6)
No change	134 (10.7)
Any worse result	387 (30.8)
All	**1,258 (100.0)**

Other patient reported outcomes

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 1,368 assessments.

Self reported health

There were 44% of patients reporting a health status of very good or excellent at post assessment, compared with 13% at the pre assessment phase. Over three quarters (79%) reported a feeling of improved health. Reductions in the numbers of patients reporting fair or poor health were observed, with only 1% of patients reporting poor health at post assessment.

Decreases in self reported health status were reported by 6% 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.

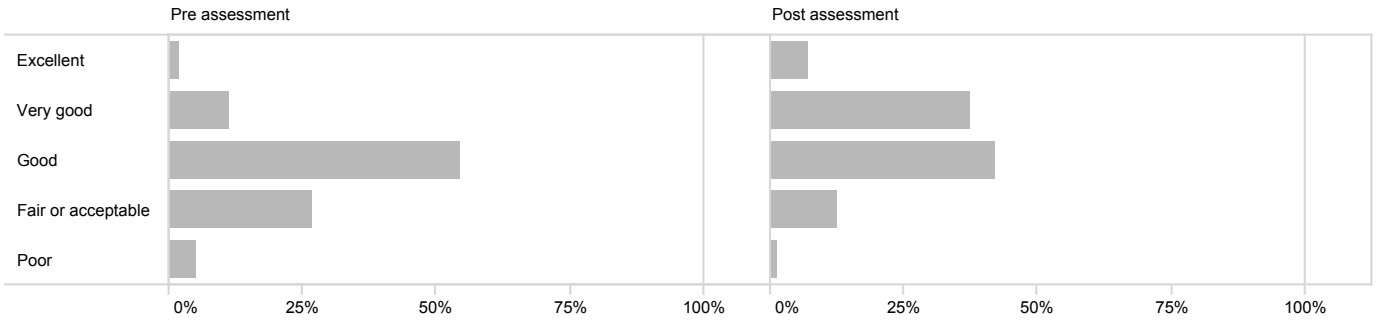


Figure 15: Comparison of patient reported health status at pre and post assessment

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

	n (%)
Any improvement	995 (78.9)
No change	191 (15.1)
Any worse result	75 (5.9)
All	**1,261 (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 3% to 9%, while those with very good mood scores increased from 13% to 39%.

There were 7% 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.

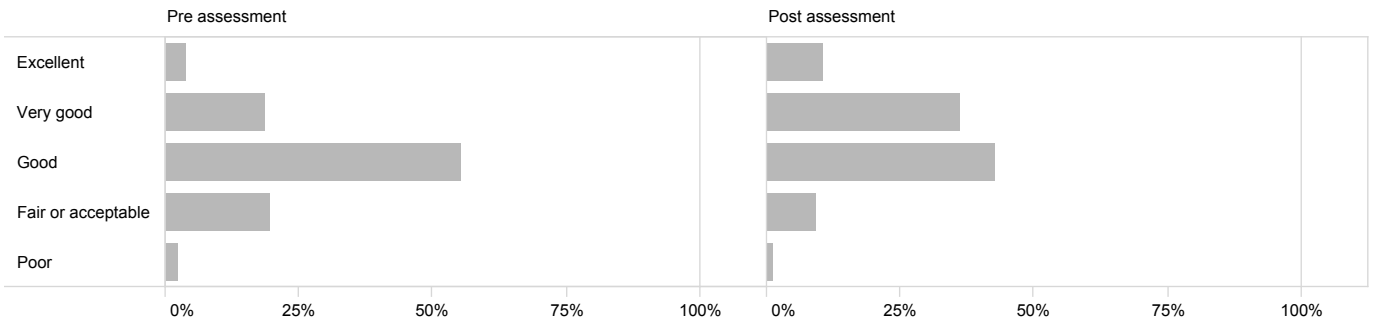


Figure 16: Comparison of patient reported mood at pre and post assessment

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

	n (%)
Any improvement	645 (51.1)
No change	532 (42.2)
Any worse result	84 (6.7)
All	**1,261 (100.0)**

Self reported fitness

When asked to compare fitness level to the period six months prior to completing a CR program, 45% of patients reported that their fitness had improved. Decreases in fitness were reported by 19% of patients. This finding may warrant further investigation as there may be various factors contributing to their reported decrease in fitness level.

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.

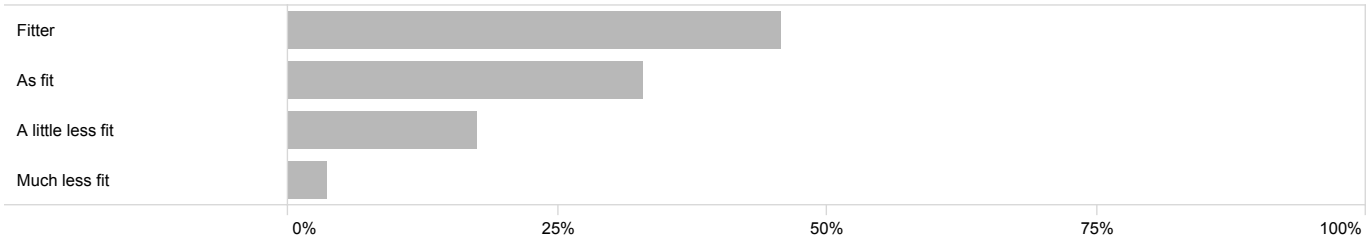


Figure 17: Patient reported change in fitness at post assessment

Table 24: Patient reported change in fitness at post assessment

	n (%)
Fitter	570 (45.2)
As fit	453 (35.9)
A little less fit	193 (15.3)
Much less fit	45 (3.6)
All	**1,261 (100.0)**

8.4 Failure to participate

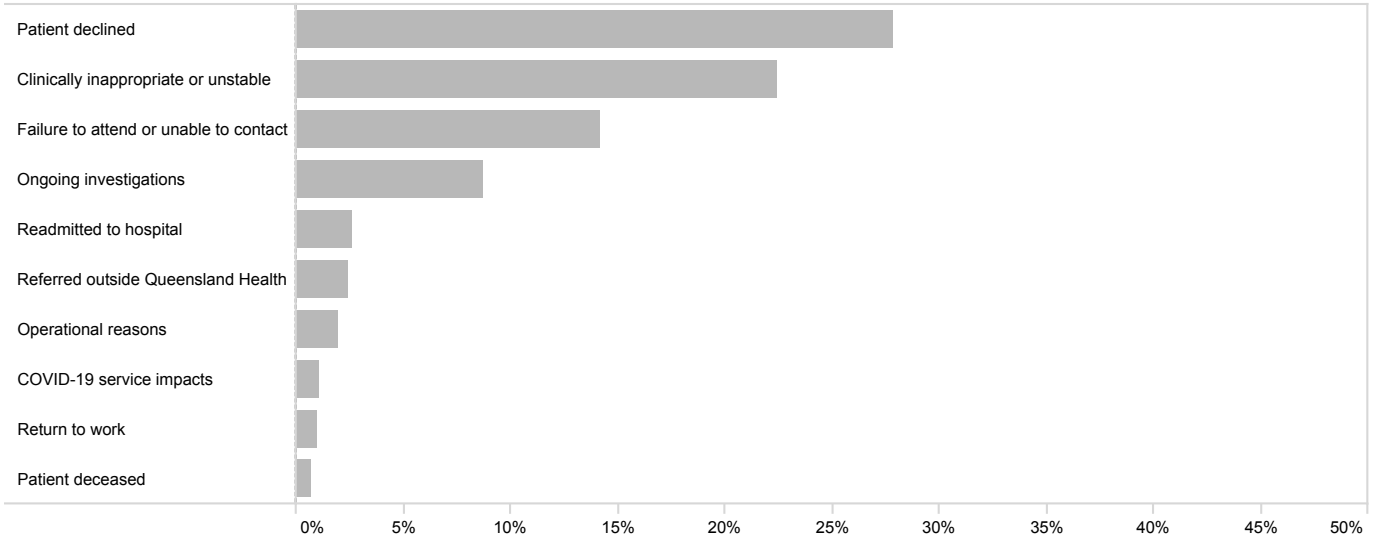
There are many reasons a patient may not participate in a CR program. In this cohort, which includes patients who declined or were unsuitable during phase 1 and phase 2, the most common reason for not participating in a CR program was that the patient had declined (28%). Twenty two percent were medically inappropriate to participate or had been uncontactable or failed to attend (12%).

For 2021 referrals, 1% were declined due to impacts of the global COVID-19 pandemic such as compulsory service closures, staff redeployment and patient unwillingness to proceed.

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 (17%)

Figure 18: Reasons for no pre assessment being conducted

8.4.1 Age and gender

There is 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 65 years, whilst patients who declined or were medically unsuitable had a median age five years older and two years older respectively.

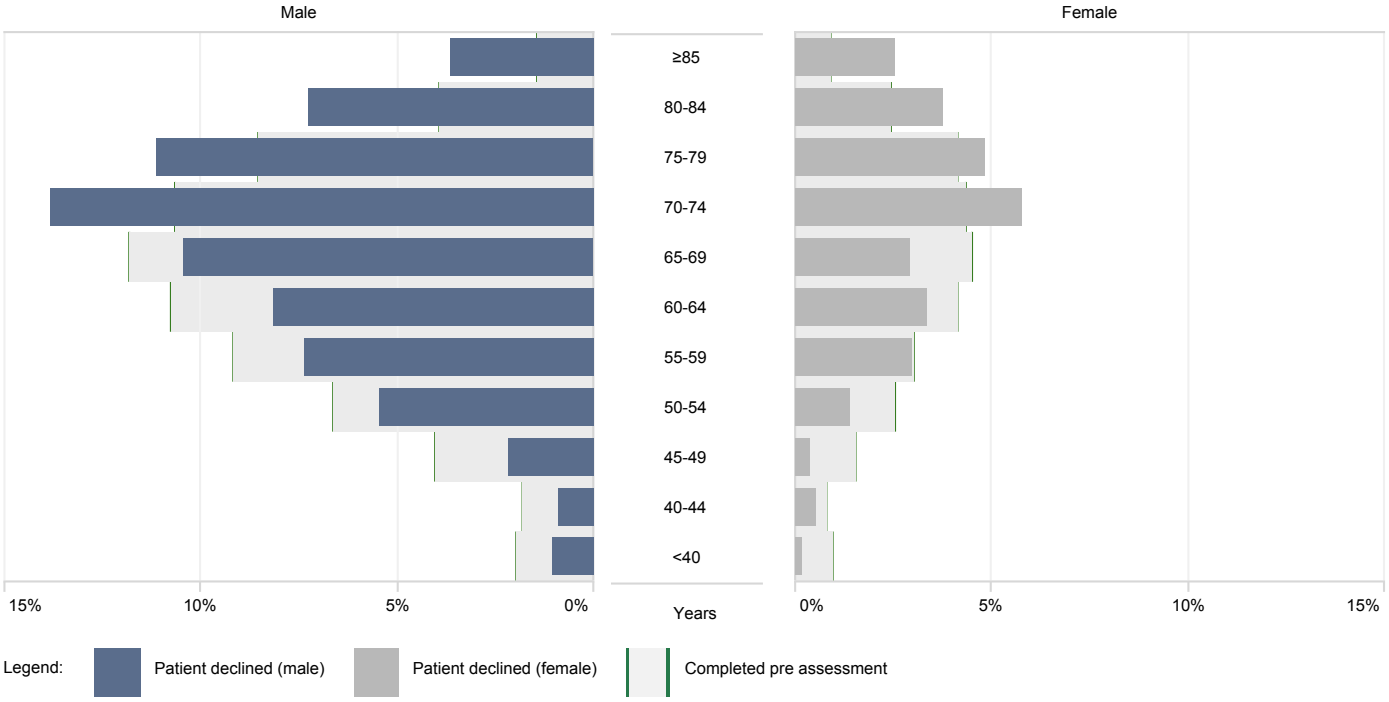


Figure 19: Patient age group and gender, patient declined vs. completed pre assessment

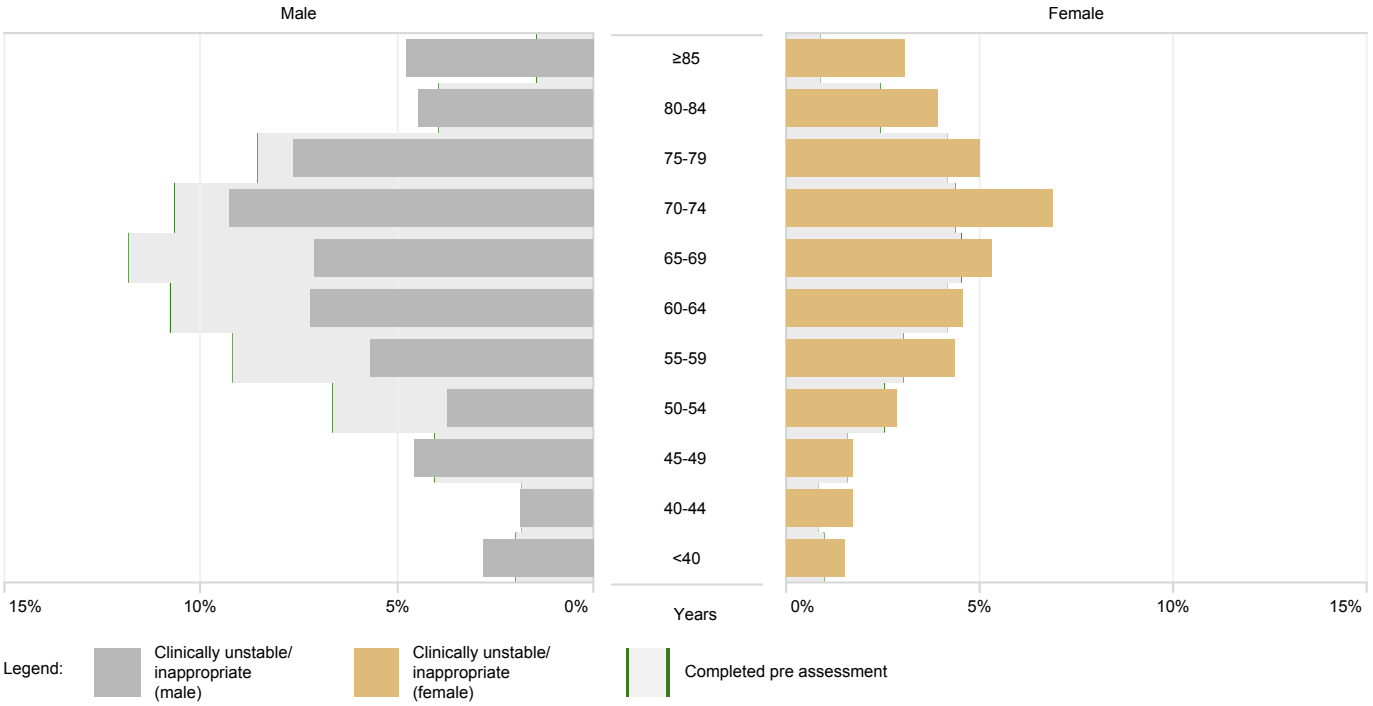


Figure 20: Patient age group and gender, clinically unstable/inappropriate vs. completed pre assessment

Table 24: Patient age (years) by program participation status

	Male Median (IQR)	Female Median (IQR)	All Median (IQR)
Pre assessment completed	65 (56–73)	66 (57–75)	65 (57–73)
Patient declined	70 (60–76)	72 (62–78)	70 (60–77)
Clinically unstable or inappropriate	67 (56–76)	67 (57–76)	67 (57–76)
Other reason not assessed	65 (56–73)	66 (54–76)	65 (55–74)

Table 26: Patient gender by program participation status

Gender	Pre assessment completed n (%)	Patient declined n (%)	Clinically unstable or inappropriate n (%)	Other reason not assessed n (%)
Female	2,151 (59.9)	326 (9.1)	376 (10.5)	738 (20.6)
Male	5,190 (62.9)	815 (9.9)	542 (6.6)	1,701 (20.6)
All	**7,341 (62.0)**	**1,141 (9.6)**	**918 (7.8)**	**2,439 (20.6)**

8.4.2 Diagnosis category

Of the patients who declined, 33% had a diagnosis of ischaemic heart disease and approximately 3% had valvular disease. The majority (65%) 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 (66% and 8% respectively).

Patients with no IHD or valvular disease were unlikely to commence a CR program, with 58% of these referrals declined by either the patient or the service. This may provide opportunities for services to review program offerings for these patients.

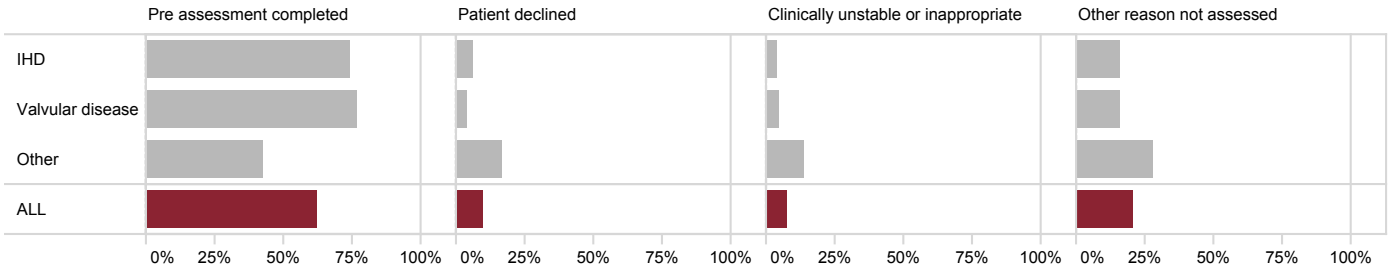


Figure 21: Proportion of cases by diagnosis category and program participation status

Table 27: Diagnosis category by program participation status

	Pre assessment completed n (%)	Patient declined n (%)	Clinically unstable or inappropriate n (%)	Other reason not assessed n (%)
IHD	4,833 (74.2)	372 (5.7)	268 (4.1)	1,039 (16.0)
Valvular disease	605 (76.3)	30 (3.8)	35 (4.4)	123 (15.5)
Other	1,903 (42.0)	739 (16.3)	615 (13.6)	1,277 (28.2)
All	**7,341 (62.0)**	**1,141 (9.6)**	**918 (7.8)**	**2,439 (20.6)**

8.4.3 Most recent procedure

For the cohort that proceeded to assessment, their most recent procedure was closely related to their participation status. 79% 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.

The majority of patients who declined CR (60%) had no recent procedure specified. Furthermore, 17% of patients that elected not to participate in CR were recorded as having undergone PCI, while approximately 5% 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.

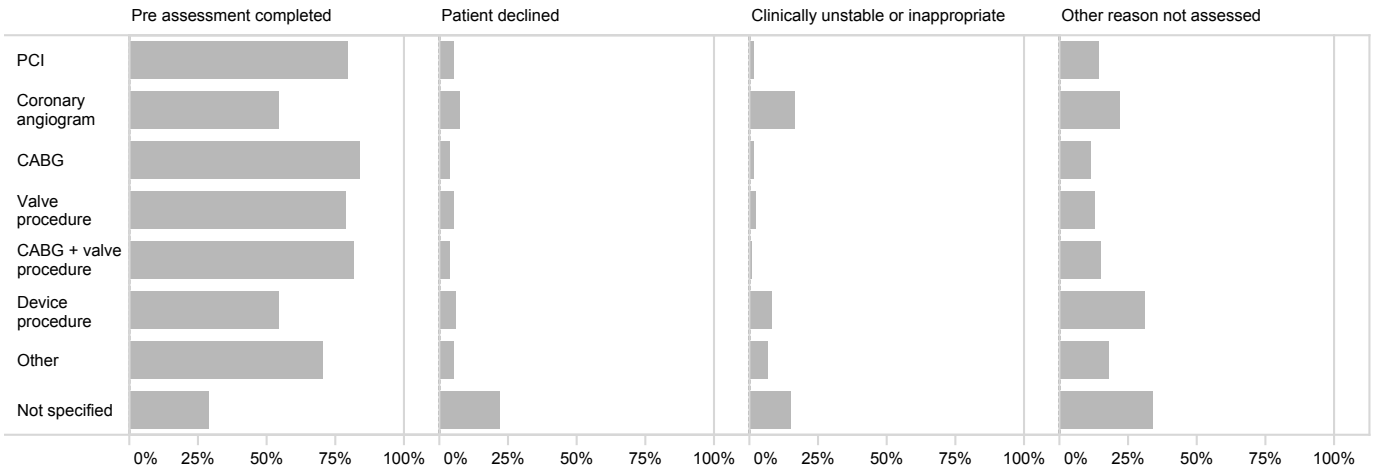


Figure 22: Proportion of referrals by most recent procedure and program participation status

Table 28: 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	3,021 (79.3)	197 (5.2)	53 (1.4)	539 (14.1)
Coronary angiogram	1,064 (54.3)	142 (7.2)	332 (16.9)	422 (21.5)
CABG	1,176 (83.8)	50 (3.6)	16 (1.1)	162 (11.5)
Valve procedure	657 (78.9)	47 (5.6)	22 (2.6)	107 (12.8)
CABG + valve procedure	164 (81.2)	7 (3.5)	1 (0.5)	30 (14.9)
Device procedure	145 (54.5)	16 (6.0)	22 (8.3)	83 (31.2)
Other	249 (70.3)	19 (5.4)	23 (6.5)	63 (17.8)
Not specified	865 (28.7)	663 (22.0)	449 (14.9)	1,033 (34.3)
All	**7,341 (62.0)**	**1,141 (9.6)**	**918 (7.8)**	**2,439 (20.6)**

8.4.4 Place of residence

Compared to patients who had taken up CR, a higher proportion of patients who elected not to participate resided in regional and remote areas of Queensland.

While there are many reasons a patient may wish not to 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 29: 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	4,138 (67.0)	604 (9.8)	300 (4.9)	1,131 (18.3)
Inner regional	1,889 (59.6)	297 (9.4)	191 (6.0)	792 (25.0)
Outer regional	1,058 (52.3)	209 (10.3)	362 (17.9)	394 (19.5)
Remote	78 (47.3)	11 (6.7)	20 (12.1)	56 (33.9)
Very remote	157 (60.4)	15 (5.8)	38 (14.6)	50 (19.2)
All	**7,320 (62.1)**	**1,136 (9.6)**	**911 (7.7)**	**2,423 (20.6)**

Excludes missing data (0.4%)

* Classified by Australian Statistical Geography Standard remoteness area

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 30: 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

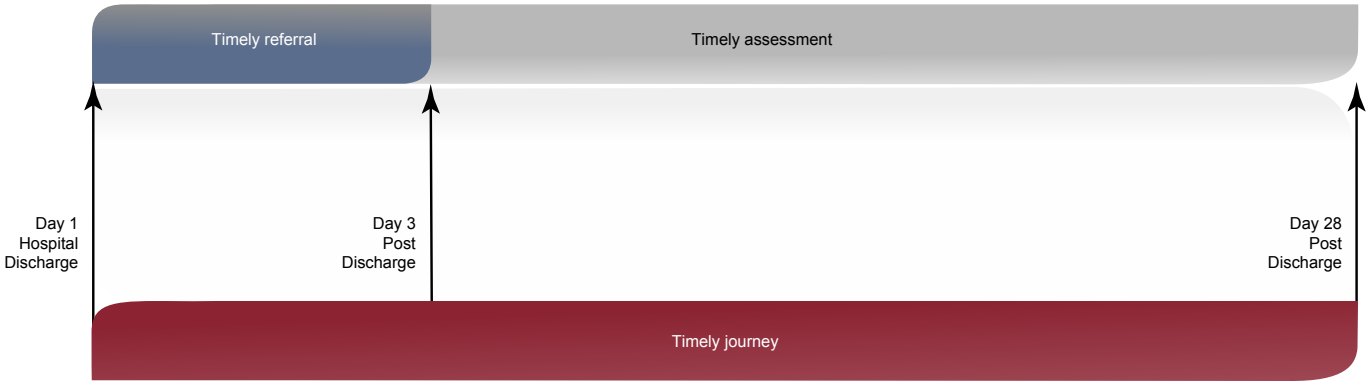


Figure 23: Timely referral, assessment and overall journey for inpatient referrals

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.

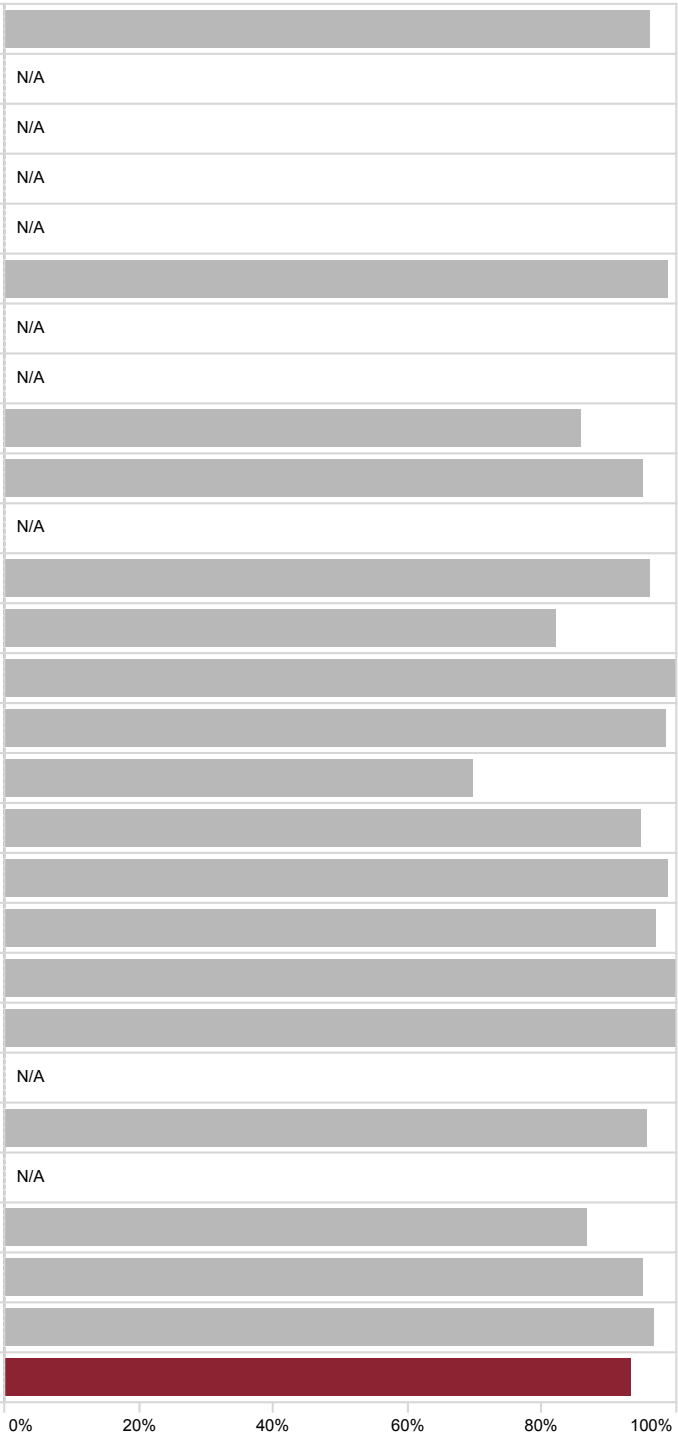
Overall, performance is high with 93% of referrals contributed to QCOR being submitted within three days of discharge.

Table 31: Timely referrals by referring HHS

Referring HHS/organisation	Total inpatient referrals n	Total eligible for analysis n	Target met n (%)
Cairns and Hinterland	542	533	511 (95.9)
Central Queensland	290	243	235 (96.7)
Darling Downs	145	141	121 (85.8)
Gold Coast	1,208	1,195	1,134 (94.9)
Mackay	124	120	115 (95.8)
Mater Health Services	69	67	55 (82.1)
Metro North	2,136	2,115	1,902 (89.9)
Metro South	1,776	1,751	1,702 (97.2)
South West	1	1	N/A
Sunshine Coast	733	708	678 (95.8)
Townsville	637	634	550 (86.8)
West Moreton	123	120	114 (95.0)
Wide Bay	31	30	29 (96.7)
Statewide	**7,815**	**7,658**	**7,147 (93.3)**

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

Referred by HHS	Referred by hospital	Total analysed, n
Cairns and Hinterland	Cairns Hospital	532
	Innisfail Hospital	1
Central Queensland	Capricorn Coast Hospital	10
	Gladstone Hospital	8
	Mount Morgan Hospital	5
	Rockhampton Hospital	219
	Woorabinda Hospital	1
Darling Downs	Kingaroy Hospital	1
	Toowoomba Hospital	140
Gold Coast	Gold Cost University Hospital	1,194
	Robina Hospital	1
Mackay	Mackay Base Hospital	120
Mater Health Services	Mater Hospital Brisbane	67
Metro North	Caboolture Hospital	133
	Redcliffe Hospital	59
	Royal Brisbane & Women's Hospital	446
	The Prince Charles Hospital	1,477
Metro South	Logan Hospital	80
	Princess Alexandra Hospital	1,545
	Queen Elizabeth II Jubilee Hospital	74
	Redland Hospital	52
North West	Mount Isa Base Hospital	1
Sunshine Coast	Sunshine Coast University Hospital	708
Townsville	Ingham Hospital	1
	Townsville University Hospital	633
West Moreton	Ipswich Hospital	120
Wide Bay	Bundaberg Base Hospital	30
Statewide		



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

Figure 24: 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 32. The exclusions are applied where information is available and has been documented in the application.

Overall, more than half of all patients (64%) are being assessed in a timely manner, however there was some variation across health services.

Table 32: Summary of referrals ineligible for timely assessment clinical indicator – inpatients

Summary	n
Not referred within 3 days of discharge	486
Same day admission	156
Clinically unstable/inappropriate	118
Patient readmitted to hospital	88
Referred outside of Queensland Health	70
Patient accepted onto existing program	61
Patient deceased	26
Total ineligible	**1,005**

Table 33: 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	595	523	343 (65.6)
Central Queensland	507	394	247 (62.7)
Central West	18	13	10 (76.9)
Darling Downs	364	321	146 (45.5)
Gold Coast	1,195	1,039	802 (77.2)
Health Contact Centre	899	731	458 (62.7)
Mackay	190	170	60 (35.3)
Metro North	1,066	961	535 (55.7)
Metro South	1,139	1,045	757 (72.4)
North West	36	31	15 (48.4)
South West	35	34	19 (55.9)
Sunshine Coast	853	718	426 (59.3)
Townsville	348	302	139 (46.0)
West Moreton	380	356	267 (75.0)
Wide Bay	190	172	108 (62.8)
Statewide	**7,815**	**6,810**	**4,332 (63.6)**

Outpatient HHS/division	Outpatient program	Total analysed, n
Cairns and Hinterland	Atherton	60
	Cairns	423
	Innisfail	36
	Tully	22
Central Queensland	Capricorn Coast	84
	Gladstone	92
	Rockhampton	256
Darling Downs	Dalby-Tara	32
	Kingaroy	71
	Toowoomba	186
	Warwick	41
Gold Coast	Gold Coast	1,182
Health Contact Centre	SMoCC	879
Mackay	Mackay	152
	Proserpine	21
Metro North	Caboolture	318
	Chermside	312
	North Lakes	303
	Redcliffe	117
Metro South	Bayside	271
	Eight Mile Plains	156
	Inala	89
	Logan-Beaudesert	500
	Princess Alexandra Hospital	101
North West	Mt Isa	36
Sunshine Coast	Caloundra	256
	Gympie	135
	Maroochydore	165
	Nambour	168
	Noosa	108
Townsville	Ayr	27
	Townsville	299
West Moreton	Ipswich	378
Wide Bay	Hervey Bay	123
	Maryborough	53
Statewide		

Sites with <20 referrals for analysis not displayed

Figure 25: 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 (61%) are being assessed in a timely manner, with some notable variation between health services.

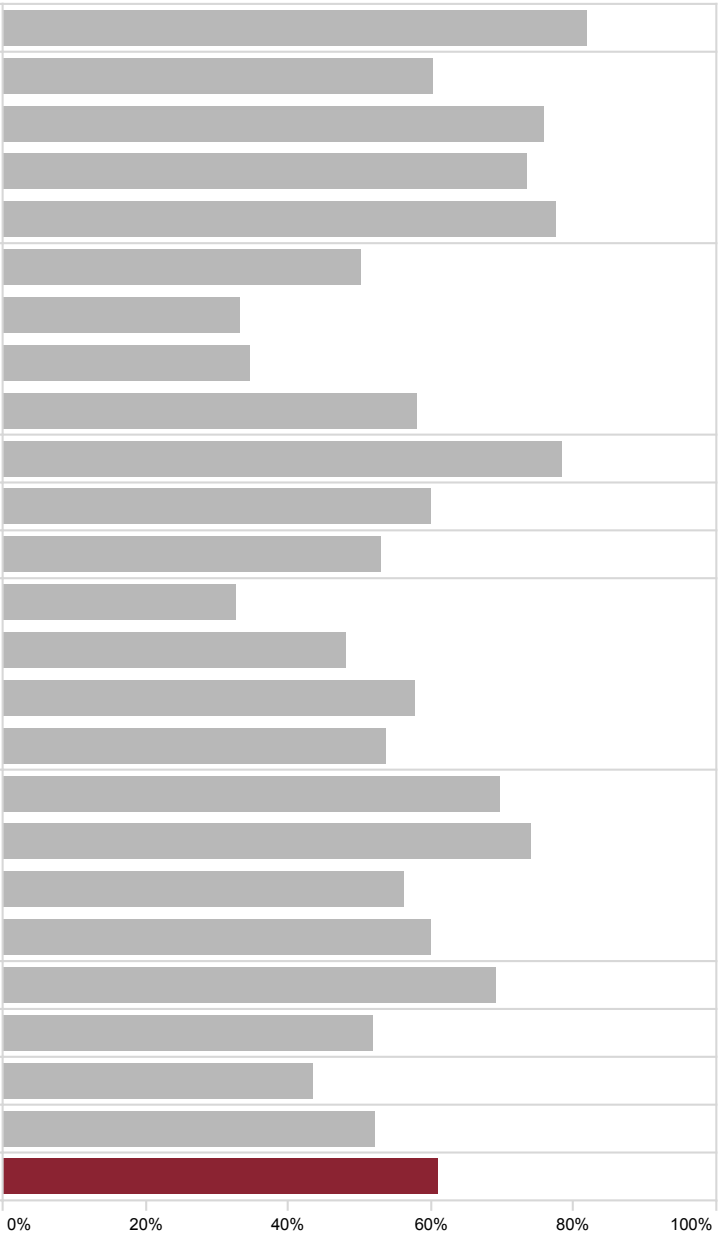
Table 33: Summary of referrals ineligible for timely assessment clinical indicator – non acute patients

Summary	n
Referred outside of Queensland Health	28
Patient accepted onto an existing program	21
Clinically unstable/inappropriate	18
Patient admitted to hospital	15
Patient deceased	2
Total ineligible	**84**

Table 35: 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	90	90	73 (81.1)
Central Queensland	451	438	320 (73.1)
Central West	14	14	11 (78.6)
Darling Downs	206	202	90 (44.6)
Gold Coast	175	166	130 (78.3)
Health Contact Centre	204	195	117 (60.0)
Mackay	116	114	52 (45.6)
Metro North	404	392	187 (47.7)
Metro South	571	558	372 (66.7)
North West	26	26	18 (69.2)
South West	46	46	35 (76.1)
Sunshine Coast	114	99	55 (55.6)
Townsville	73	73	30 (41.1)
West Moreton	301	295	154 (52.2)
Wide Bay	41	40	33 (82.5)
Statewide	**2,832**	**2,748**	**1,677 (61.0)**

Outpatient HHS/division	Outpatient program	Total analysed, n
Cairns and Hinterland	Cairns	44
Central Queensland	Capricorn Coast	91
	Gladstone	70
	Mount Morgan	49
	Rockhampton	222
Darling Downs	Dalby-Tara	26
	Kingaroy	45
	Toowoomba	72
	Warwick	38
Gold Coast	Gold Coast	166
Health Contact Centre	SMoCC	195
Mackay	Mackay	98
Metro North	Caboolture	123
	Chermside	50
	North Lakes	135
	Redcliffe	84
Metro South	Bayside	230
	Eight Mile Plains	92
	Inala	39
	Logan-Beaudesert	183
North West	Mt Isa	26
Sunshine Coast	Caloundra	27
Townsville	Townsville	69
West Moreton	Ipswich	295
Statewide		



Sites with <20 referrals for analysis not displayed

Figure 26: 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 36. 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 36: Summary of referrals ineligible for timely journey clinical indicator – inpatients

Summary	n
Same day admission	156
Clinically unstable/inappropriate	118
Patient readmitted to hospital	88
Referred outside of Queensland Health	70
Patient accepted onto existing program	61
Patient deceased	26
Total ineligible	**519**

Table 37: 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	1137	600	365 (60.8)
Central Queensland	797	441	253 (57.4)
Central West	18	14	N/A
Darling Downs	509	380	161 (42.4)
Gold Coast	2,403	1,170	834 (71.3)
Health Contact Centre	899	848	458 (54.0)
Mackay	314	195	68 (34.9)
Mater Health Services	69	67	41 (61.2)
Metro North	3,202	2,085	1,180 (56.6)
Metro South	2,915	1,868	1,260 (67.5)
North West	37	36	15 (41.7)
South West	35	35	19 (54.3)
Sunshine Coast	1,586	837	478 (57.1)
Townsville	985	634	286 (45.1)
West Moreton	503	382	275 (72.0)
Wide Bay	221	201	118 (58.7)
Statewide	**7,815**	**7,296**	**4,332 (59.4)**

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

* Includes both incoming and outgoing referrals

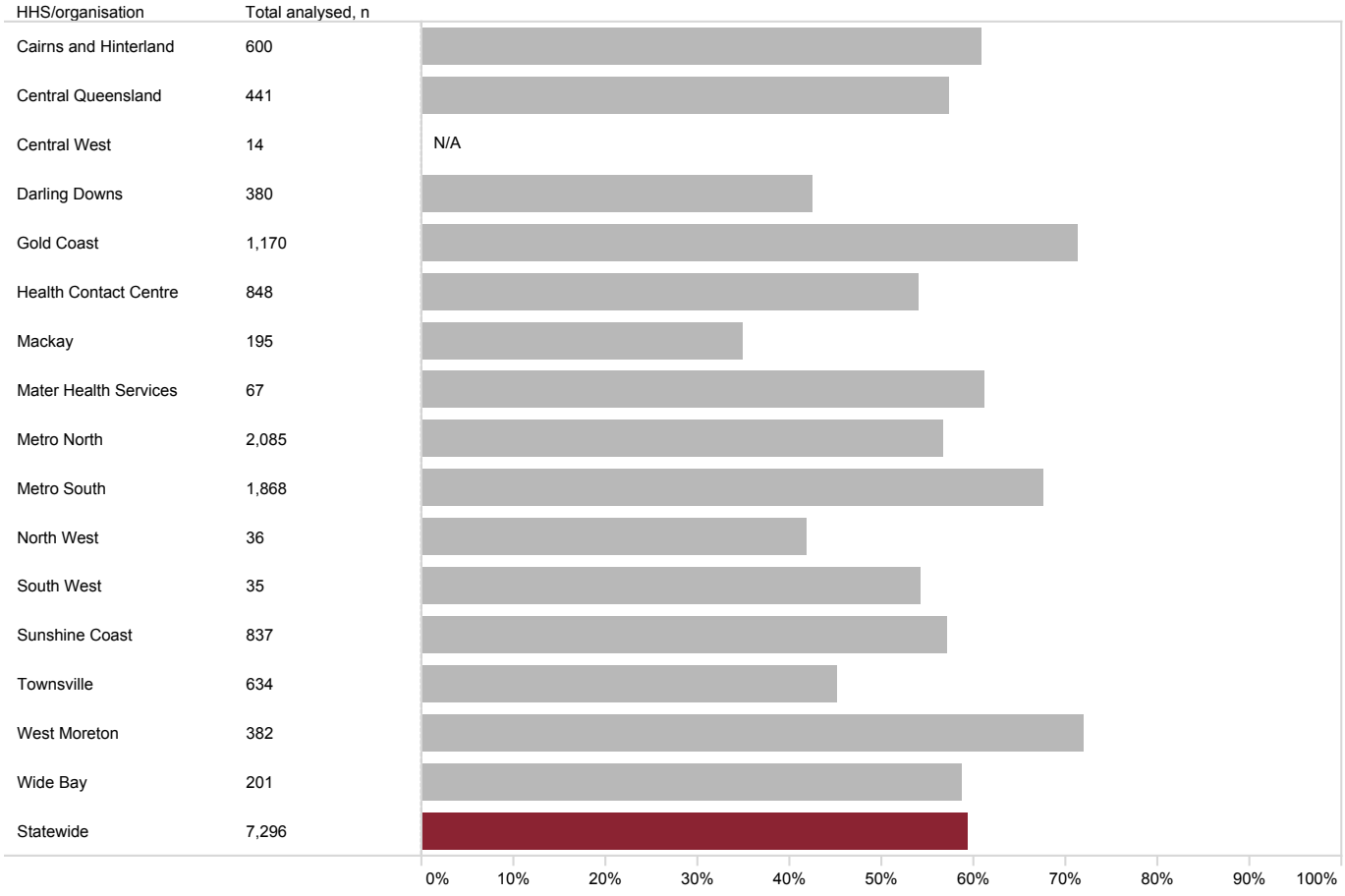


Figure 27: Timely journey indicator by participating HHS – inpatients

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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
AUC	Area Under Curve
ARB	Angiotensin II Receptor Blocker
ARF	Acute Rheumatic Fever
ARNI	Angiotensin Receptor-Neprilysin Inhibitors
ASD	Atrial Septal Defect
AV	Atrioventricular
AVNRT	Atrioventricular Nodal Re-entry Tachycardia
BCIS	British Cardiovascular Intervention Society
BiV	Biventricular
BMI	Body Mass Index
BMS	Bare Metal Stent
BNH	Bundaberg Hospital
BSSLTx	Bilateral Sequential Single Lung Transplant
BVS	Bioresorbable Vascular Scaffold
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
COVID-19	Coronavirus disease 2019
CPB	Cardiopulmonary Bypass
CR	Cardiac Rehabilitation
CRT	Cardiac Resynchronisation Therapy
CS	Cardiac Surgery
CVA	Cerebrovascular Accident
DAOH	Days Alive and Out of Hospital
DES	Drug Eluting Stent
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	Generalized Anxiety Disorder
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
H-L	Hosmer–Lemeshow Test Statistic
HOCM	Hypertrophic Obstructive Cardiomyopathy
HSQ	Health Support Queensland
IC	Interventional Cardiology
ICD	Implantable Cardioverter Defibrillator
IE	Infective Endocarditis
IHT	Inter-hospital Transfer
IPCH	Ipswich Community Health
IVDU	Intravenous Drug Use
LAA	Left Atrial Appendage
LAD	Left Anterior Descending Artery
LCX	Circumflex Artery
LGH	Logan Hospital
LOS	Length Of Stay
LV	Left Ventricle
LVEF	Left Ventricular Ejection Fraction
LVOT	Left Ventricular Outflow Tract
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
NCR	National Cardiac Registry
NCS	Networked Cardiac Services
NP	Nurse Practitioner
NRBC	Non-Red Blood Cells
NSTEMI	Non ST Elevation Myocardial Infarction
OR	Odds Ratio
OOHCA	Out of Hospital Cardiac Arrest
ORIF	Open Reduction Internal Fixation
PAH	Princess Alexandra Hospital
PAPVD	Partial Anomalous Pulmonary Venous Drainage
PCI	Percutaneous Coronary Intervention
PDA	Patent Ductus Arteriosus
PFO	Patent Foramen Ovale
PHQ	Patient Health Questionnaire
PICU	Paediatric intensive care unit
PROMS	Patient Reported Outcome Measures
QAS	Queensland Ambulance Service
QCCN	Queensland Cardiac Clinical Network
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
SCCIU	Statewide Cardiac Clinical Informatics Unit
SCUH	Sunshine Coast University Hospital
SHD	Structural Heart Disease
SMoCC	Self Management of Chronic Conditions
STEMI	ST-Elevation Myocardial Infarction
STS	Society of Thoracic Surgery
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
TXA	Tranexamic Acid
VAD	Ventricular Assist Device
VATS	Video Assisted Thoracic Surgery
VCOR	Victorian Cardiac Outcomes Registry
VF	Ventricular Fibrillation
VSD	Ventricular Septal Defect

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