NATIONAL CARDIAC REGISTRY®

Her Heart

The Cardiac Equity Report: Women & PCI in Australia

A collaborative report developed by Her Heart and the National Cardiac Registry (NCR)

TABLE OF CONTENTS

GLOSSARY

Acute Coronary Syndrome (ACS) refers to a spectrum of conditions caused by reduced blood flow to the heart, including ST-Elevation Myocardial Infarction (STEMI), Non-ST Elevation Myocardial Infarction (NSTEMI) and unstable angina.

Cardiac Rehabilitation is a structured program of exercise, education and support designed to aid recovery and reduce future cardiovascular risk.

Clinical Quality Indicator (CQI) is a measure used to assess the quality, safety and effectiveness of healthcare.

Clinical Quality Registry (CQR) is a system that collects and analyses healthcare data to monitor quality of care and support continuous quality improvement.

Comorbidity refers to the presence of one or more additional medical conditions occurring alongside a primary condition.

Coronary Artery Bypass Grafting (CABG) is a surgical procedure used to bypass blocked coronary arteries.

Femoral Access refers to PCI performed via the femoral artery.

Major Adverse Cardiovascular and Cerebrovascular Events (MACCE) is a composite outcome commonly including death, myocardial infarction, stroke and repeat revascularisation.

National Cardiac Registry (NCR) is a registry that aims to measure, monitor and report on national clinical quality outcomes data on cardiovascular procedures and cardiac devices, with the purpose of improving patient safety and cardiac health care.

Percutaneous Coronary Intervention (PCI) is a minimally invasive procedure used to treat coronary artery disease and restore blood flow to the heart.

Primary PCI refers to urgent PCI performed as the initial reperfusion strategy for patients presenting with acute STEMI.

Radial Access refers to PCI performed via the radial artery and is associated with lower rates of vascular and bleeding complications than femoral access.

Reperfusion refers to the restoration of blood flow to the heart muscle following a blocked coronary artery.

Sex Differences: Differences in disease presentation, treatment and outcomes between women and men related to biological sex.

ST-Elevation Myocardial Infarction (STEMI) is a severe form of heart attack requiring urgent reperfusion therapy.

FOREWORD

Cardiovascular disease remains one of the leading causes of morbidity and mortality among Australian women.

Despite advances in cardiac care, important differences persist in how women present, are treated and experience outcomes following Percutaneous Coronary Intervention (PCI).

Drawing on nationally collected clinical quality registry data, this report provides a contemporary overview of women undergoing PCI in Australia.

The National Cardiac Registry (NCR) is one of Australia's largest clinical quality datasets for PCI, capturing more than 119,000 procedures across participating hospitals and supporting national benchmarking, monitoring of clinical quality indicators and quality improvement.

The findings demonstrate that women undergoing PCI continue to present at an older age and with greater clinical complexity due to comorbidities. They are more likely to experience delays to treatment and major bleeding complications, are less likely to receive radial access, and have higher in-hospital mortality than men.

These findings reinforce that sex differences in cardiovascular care remain clinically important and highlight opportunities to strengthen earlier recognition, equitable access to best-practice care and ongoing quality improvement. They also demonstrate the importance of routinely reporting and monitoring sex-disaggregated data to better understand variation in care and support evidence-informed clinical practice.

As a collaboration between clinicians, health services and consumer organisations, the NCR plays an important role in identifying variation in care and opportunities to improve cardiovascular outcomes for women across Australia.

Prof. Linda Worrall-Carter
Founder and CEO
Her Heart

A/Prof. Jeff Lefkovits OAM
Steering Committee Chair
and Clinical Lead
National Cardiac Registry

ABOUT THE PARTNERSHIP

National Cardiac Registry Limited is an independent not-for-profit organisation governed by the NCR Board and its Committees with an inspiring vision of 'Better cardiac outcomes for all Australians, powered by national data'.

The company is established for the charitable purpose of measuring, monitoring and reporting on cardiac health care outcomes and clinical variance in findings, and identifying areas of improvement for cardiac health care across Australia.

Partnering with Her Heart is in alignment with the new NCR Strategic Directions Improving Cardiac Outcomes Together and the goal to 'Empower stakeholders with NCR Data for quality improvement'.

With a national perspective and robust national footprint of committed people at its core, the NCR is excited to work with Her Heart commencing with the collaboration on the key insights in this Cardiac Equity Report for Women and PCI in Australia as led by A/Prof. Jeff Lefkovits Chair of the NCR Steering Committee.

The NCR works collaboratively with jurisdictional registries, clinicians, hospitals, consumers and key stakeholders to support consistent data collection, national reporting and informed cardiovascular care.

Her Heart is Australia's only not-for-profit organisation dedicated exclusively to supporting the heart health needs of women. The partnership between Her Heart and NCR reflects a shared commitment to improving understanding of women's cardiovascular health and increasing the visibility of sex-specific data within clinical practice, quality improvement and policy discussions.

Through this collaboration, the report aims to strengthen awareness of current national trends relating to women and PCI, while supporting broader conversations regarding equity, quality improvement and improved cardiovascular outcomes for women across Australia.

NCR BACKGROUND

NCR is Australia's national clinical quality registry for PCI. The registry supports benchmarking, quality improvement and national reporting through the collection of standardised clinical data from participating hospitals across Australia.

Clinical quality registries play an important role in improving healthcare by identifying variation in care, monitoring outcomes and supporting evidence-based improvements in clinical practice. Sex-disaggregated reporting is particularly important in cardiovascular disease, where differences in risk factors, presentation, treatment pathways and outcomes between women and men continue to be observed.

The NCR provides one of Australia's largest cardiovascular datasets and offers an important opportunity to better understand differences in cardiovascular care and outcomes between women and men. By making these data visible, the registry supports ongoing quality improvement, informed policy discussions and more equitable cardiovascular care.

The NCR dataset includes contributions from jurisdiction-based registries and participating sites from all states and territories in Australia. Contributing State and Territory registries include;

119,000+
Procedures captured

25,495
PCI procedures in 2024

64
Contributing hospitals

58
Active hospitals (2024)

118
Data elements

11
Clinical quality indicators

- Australian Capital Territory Cardiac Outcomes Registry (ACTCOR)
- New South Wales Cardiac Outcomes Registry (NSWCOR)
- Northern Territory Top End Coronary Database (NTTCD)
- Queensland Cardiac Outcomes Registry (QCOR)
- Coronary Angiogram Database of South Australia (CADOSA)
- Victorian Cardiac Outcomes Registry (VCOR)
- Tasmania participates via VCOR
- Cardiac Registry of Western Australia (CRoWA)

This collaborative model supports broad national representation and contributes to the growing national understanding of PCI practice and outcomes across Australia.

EXECUTIVE SUMMARY

Cardiovascular disease remains one of the leading causes of death for Australian women and a major contributor to illness, disability and healthcare utilisation across Australia.

The NCR provides a national platform to support benchmarking, quality improvement and greater consistency in cardiovascular care. In 2024, the NCR included 25,495 PCI procedures performed across 58 participating hospitals nationally, representing all eight Australian jurisdictions.

Analysis of the 2024 data demonstrates that women continue to experience important differences in presentation characteristics, treatment pathways and outcomes when compared with men undergoing PCI, while women represented 24.9% of all PCI procedures and presented at an older median age than men (70 years vs 66 years).

Women demonstrated a greater burden of clinical complexity, including higher rates of diabetes and severe obesity.

WOMEN UNDERGOING PCI

24.9%
of all PCI procedures nationally

Older age
Women undergoing PCI were older than men

Greater Complexity
Women undergoing PCI were older than men

ACCESS TO CARE

Longer delays
from symptom onset to first medical contact.

Treatment delay
Women experienced slower access to acute cardiac care.

Potential missed opportunities
Delayed recognition may contribute to poorer outcomes.

PROCEDURAL & CLINICAL OUTCOMES

Lower
use of radial artery access compared to men.

Higher major bleeding
Greater rates of major bleeding complications.

Higher in-hospital mortality
Increased in-hospital mortality compared with men.

The findings also demonstrate persistent differences in access to recommended procedural approaches and timeliness of care. Women experienced longer delays from symptom onset to first medical contact and lower rates of radial access utilisation. These factors were associated with higher rates of major bleeding complications and in-hospital mortality.

These findings reinforce the importance of a continued national focus on women's cardiovascular health, timely recognition of cardiac symptoms, equitable procedural practice and the ongoing use of registry data to support quality improvement across the Australian healthcare system.

Lefkovits, J., Poulter, R., Pyyvaara, J., Brennan, A., Dinh, D., Stewart, R., Sivakumaran, T. & Lucas, M. (2025). NCR Annual Status Report 2025. National Cardiac Registry.

BACKGROUND & NATIONAL CONTEXT

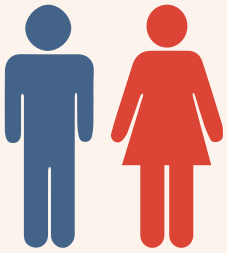
Cardiovascular disease remains a leading cause of illness, disability and death in Australia, accounting for approximately 12% of the total disease burden nationally, and continues to represent a major public health challenge*.

While substantial advances in cardiovascular treatment and secondary prevention have improved outcomes, important differences in presentation, treatment pathways and outcomes between women and men remain.

Women often present with different risk profiles to men, including older age at presentation, differing symptom patterns and a higher prevalence of certain comorbidities. These factors can influence both recognition of symptoms and subsequent treatment. Understanding sex-specific patterns within cardiovascular care is therefore important in supporting equitable and evidence-based practice.

Clinical quality registries play an important role in identifying variation in care, supporting national benchmarking and informing quality improvement initiatives. The NCR provides Australia's most comprehensive dataset relating to PCI practice and offers a valuable opportunity to examine differences between women and men across the patient journey.

The findings presented in this report highlight the importance of ongoing efforts to improve cardiovascular outcomes for women through timely diagnosis, equitable access to care and continued quality improvement.



Sex-specific data helps identify inequities in care and outcomes

National benchmarking helps monitor variation in clinical practice

Registry findings can inform quality improvement, policy and future research.

*Australian Institute of Health and Welfare (2025) Heart, stroke and vascular disease: Australian facts, AIHW, Australian Government, accessed 1 September 2025

METHODOLOGY

Data Collection and Governance

Data submitted to the NCR undergoes established validation and quality assurance processes designed to support data completeness, consistency and reliability.

The registry maintains high standards of data quality through jurisdictional review, ongoing monitoring and data validation activities.

The registry operates within a nationally coordinated governance framework and applies principles aligned with the Five Safes Framework** to support secure data handling, appropriate governance and controlled data access.

The NCR also operates under Human Research Ethics Committee (HREC) approval and relevant governance arrangements across participating jurisdictions and sites.

Contributing Registries
This collaborative model supports broad national representation and provides a robust foundation for understanding PCI practice and outcomes across Australia.

** Australian Institute of Health and Welfare (2025) The Five Safes framework, accessed 15 October 2025 https://www.aihw.gov.au/about-our-data/data-governance/the-five-safes-framework

METHODOLOGY

Variables and Measures
The report examines patient demographic characteristics, clinical presentation (including STEMI, NSTEACS and elective PCI), procedural and outcome variables relevant to current PCI Practice. Measures included age, comorbidities, procedural characteristics, vascular access approach, discharge therapies, referral to cardiac rehabilitation, and in-hospital and 30-day outcomes.

Analyses
Sex-based comparisons were undertaken to examine differences in patient characteristics, clinical presentation, treatment pathways and outcomes between women and men undergoing PCI. Descriptive analyses were used to identify patterns and variation in care and outcomes across the patient journey.

Limitations
As with all observational registry analyses, findings should be interpreted within the context of available data completeness and variation in jurisdictional collection methods. Completeness of some 30-day outcome indicators remains lower than that of in-hospital indicators, as jurisdictions continue to expand data collection. The comparisons presented are descriptive and have not yet been adjusted for differences in baseline characteristics, including age and comorbidities.

The NCR captures patients undergoing PCI and therefore excludes those outside this cohort. These findings should not be considered representative of all women with cardiovascular disease or all women presenting with acute coronary syndromes.

Age

Patient age distribution

Comorbidities

Presence of medical conditions such as diabetes, hypertension, renal disease and prior CVD

Procedural Characteristics

Clinical presentation, lesion complexity, stent use and procedural success.

Vascular Access Approach

Type of vascular access used, radial or femoral.

Discharge Therapies

Medications prescribed at discharge such as antiplatelets, statins, ACE inhibitors and others.

Referral to Cardiac Rehabilitation

Referral to secondary prevention and cardiac rehabilitation programs

In-Hospital Outcomes

Outcomes during hospital admission, including mortality, bleeding,
stroke and other complications

30-Day Outcomes

Outcomes within 30 days post-discharge, including mortality, readmission and unplanned revasularisaion.

ANALYSES

NCR data were analysed to examine differences in patient characteristics, treatment pathways and outcomes between women and men undergoing PCI across Australia.

Dataset Description
The analysis presented in this report is derived from data collected by the NCR between 1 January and 31 December 2024. During this period, 25,495 PCI procedures were recorded across 58 participating hospitals, representing 22,733 individual patients. Collectively, the NCR has now captured more than 119,000 procedures across Australia, with 64 hospitals having contributed data to the registry over time. The NCR currently captures approximately 50% of all PCI procedures performed annually in Australia.

The NCR captures 118 data elements including patient characteristics, clinical presentation, procedural details, and outcomes, supporting national benchmarking and quality improvement activities.

The NCR reports against 11 nationally agreed Clinical Quality Indicators, comprising five performance indicators and six outcome indicators, which support monitoring of care delivery and patient outcomes across the PCI pathway.

Study Population
The study population included adult patients undergoing PCI procedures captured within NCR sites during the reporting period. Patients were included in accordance with NCR data definitions and registry eligibility requirements for PCI procedures. Analysis included comparisons between women and men across demographic, clinical, procedural and outcome measures.

119,000+

PCI procedures captured across Australia

25,495

PCI procedures recorded in 2024

118

Data elements captured

64

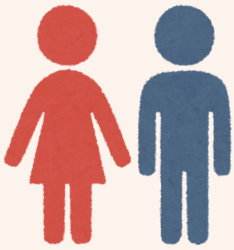
Contributing hospitals

Lefkovits, J., Poulter, R., Pyyvaara, J., Brennan, A., Dinh, D., Stewart, R., Sivakumaran, T. & Lucas, M. (2025). NCR Annual Status Report 2025. National Cardiac Registry.

AGE & CLINICAL COMPLEXITY

Women undergoing PCI in Australia were, on average, older than men, contributing to greater clinical complexity

AGE AT TIME OF PCI
(YEARS)



WOMEN 61-78
MEN 58-75

WOMEN

70

YEARS

(61-78)

MEN

66

YEARS

(58-75)

4

YEARS OLDER

Women were on average 4 years older than men at the time of PCI

Women generally live longer than men, which can result in a higher proportion of older women requiring PCI.

Delayed presentation can lead to later diagnosis and treatment.

Cardiac symptoms may be underestimated, contributing to delays in diagnosis and treatment.

Older women undergoing PCI often have more comorbid conditions, such as hypertension and diabetes, which can complicate and delay treatment

24.9%

Women accounted for 24.9% of all PCI procedures performed in 2024

22.4%

Women accounted for 22.4% of primary PCI procedures performed in 2024

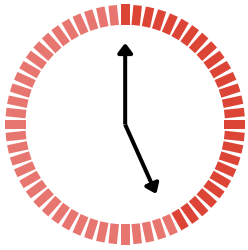
WHY THIS MATTERS

Older age and greater clinical complexity can:

- Increase procedural risk
- Contribute to more challenges in in-hospital management
- Influence recovery and longer-term outcomes

DELAYS IN TREATMENT

Women undergoing primary PCI experienced longer delays across key stages of the treatment pathway compared with men.



27 minutes longer

Procedural timings for women undergoing primary PCI for acute STEMI were approximately **27 minutes longer** than for men.

First Medical Contact - Reperfusion

+12 Minutes

longer for women compared with men

Time from first medical contact to reperfusion

Diagnostic ECG - Reperfusion

+7 Minutes

longer for women compared with men

Time from diagnostic ECG to reperfusion

Timely treatment remains critical.

Delays in receiving treatment can impact the amount of heart muscle damaged and influence recovery following an acute cardiac event.

WHY THIS MATTERS

Increased heart muscle damage

Delays can allow more heart muscle to be affected during a heart attack

Longer recovery times

Delayed treatment may lead to longer hospital stays and recovery periods.

Greater risk of complications

Delays are associated with higher risk of heart failure and other complications.

Timely access saves lives

Faster treatment is essential for the best possible outcomes for all patients.

COMORBIDITIES & CARDIOVASCULAR RISK

Women presenting with acute coronary syndromes in Australia have a higher burden of comorbidities and cardiovascular risk factors compared with men. The findings presented compare women with men undergoing PCI. The NCR captures patients undergoing PCI and therefore does not include patients outside this cohort. These findings should not be considered representative of all women with cardiovascular disease or all women presenting with acute coronary syndromes.

Higher burden

of comorbidities and cardiovascular risk factors in women.

Women with acute coronary syndromes were more likely than men to have multiple comorbid conditions and cardiovascular risk factors

More common in women compared with men

(Unadjusted percentages)

	WOMEN	MEN
DIABETES	31%	28%
SEVERE OBESITY	17.6%	11.7%

Women compared with men

Women carry a greater burden of risk

The higher prevalence of comorbidities and risk factors in women highlights the importance of comprehensive risk assessment and management to improve cardiovascular outcomes.

WHY THIS MATTERS

Higher risk profile

A greater burden of comorbidities and risk factors increases the risk of adverse events.

More complex care needs

Managing multiple conditions can be more challenging and requires coordinated care.

Opportunity for improvement

Early identification and management of risk factors can improve outcomes for women.

Focus on prevention and control

Addressing risk factors is essential to reduce future cardiovascular events.

DIFFERENCES IN CARE

Women were less likely to undergo PCI using radial access compared with men.

Use of radial access for PCI

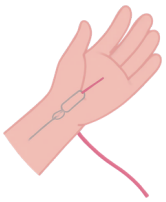
76.8%
WOMEN

vs

82.4%
MEN

Women were significantly less likely to undergo PCI via radial access compared with men.

WHAT IS RADIAL ACCESS?



Radial access involves inserting the guide wire via the wrist rather than the groin.

WHY IS RADIAL ACCESS IMPORTANT?

Lower bleeding risk
Radial access is associated with significantly less bleeding

Fewer complications
Lower risk of access site complications compared with femoral access.

Earlier mobilisation
Patients can sit up and move sooner, leading to faster recovery

Improved patient experience
Less discomfort and greater satisfaction for patients.

A significant gap in care

Women with acute coronary syndromes are less likely to receive radial access for PCI, despite the well-established benefits of this approach.

WHY THIS MATTERS

Bleeding matters

Bleeding complications are associated with worse outcomes and higher mortality

Better outcomes with radial access

Radial access is associated with lower bleeding risk, fewer complications and improved outcomes.

Equitable care for all

Addressing differences in care is essential to ensure the best possible outcomes for women

Opportunity for improvement

Increasing the use of radial access in women represents an important quality improvement opportunity

Given the association between radial access and reduced bleeding risk, this finding highlights an important area for ongoing quality improvement and research.

COMPLICATIONS & MORTALITY

Women experienced higher rates of in-hospital complications compared with men.

Higher rates of complications in women

Women experienced higher rates of in-hospital major bleeding complications compared with men

	WOMEN	MEN
In-hospital major bleeding complications	0.9%	0.5%
In-hospital mortality was higher among women than men	2.0%	1.6%

This report identifies important differences between women and men undergoing PCI in Australia. Women were older, had a higher prevalence of diabetes and severe obesity, were less likely to receive radial access and, within the primary PCI cohort for STEMI, experienced longer treatment delays. Women also experienced higher rates of in-hospital major bleeding compared with men.

WHY THIS MATTERS

Higher in-hospital complications

Women experienced higher rates of in-hospital major bleeding complications following PCI compared with men

More complications, more impact

Complications can lead to longer hospital stays, greater suffering and higher healthcare costs.

Differences in care pathways

Differences in treatment patterns were observed between women and men undergoing PCI. Risk-adjusted analyses are currently being implemented.

Opportunity to improve

Identifying and addressing gaps in care can help reduce harm and save lives for women.

Targeted strategies to reduce complications in women are essential to achieve equitable, high-quality care for all patients.

DISCUSSIONS & IMPLICATIONS

The findings presented in this report highlight important differences in patient characteristics, treatment pathways and outcomes between women and men undergoing PCI in Australia.
While no single factor explains these differences, the results demonstrate the interactions between clinical complexity, delays in treatment, procedural practice and broader health system influences.

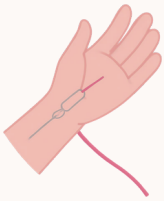
Clinical Complexity

Women undergoing PCI were generally older and presented with higher rates of diabetes and severe obesity, contributing to greater clinical complexity and procedural risk

Delays in Care

Women experienced longer delays across key stages of the treatment pathway, reinforcing the importance of timely symptom recognition and rapid access to treatment

Differences in Care



Lower utilisation of radial access highlights opportunities to further examine procedural variation and support equitable access to best-practice care.

Outcomes

Higher rates of bleeding complications and in-hospital mortality demonstrate the importance of ongoing monitoring, benchmarking and quality improvement initiatives.

Key Message

The findings presented in this report are consistent with international reports describing the differences between women and men in the recognition, presentation, treatment and outcomes of cardiovascular disease.
The findings summarised in this report are based on the NCR Annual Status Report 2025 and highlight where differences exist between women and men undergoing PCI. The report does not explore the relative contribution of individual patient, clinical or health system factors to these observed differences.

System Implications

- **Continued national benchmarking**
- **Ongoing sex-specific reporting**
- **Data-driven quality improvement**
- **Improved recognition of women's cardiovascular risk**
- **Collaboration across the cardiovascular sector**

CONCLUSION & STRATEGIC PRIORITIES

The findings presented in this report provide an important national perspective on women undergoing PCI in Australia. While cardiovascular care continues to evolve, important differences in presentation, treatment pathways and outcomes between women and men remain.

The report highlights the value of nationally coordinated clinical quality registry data in identifying variation in care, informing practice and supporting quality improvement initiatives. Continued use of sex-disaggregated data will remain important in strengthening understanding of women's cardiovascular health and supporting evidence-informed decision-making.

Improving outcomes for women will require ongoing collaboration between clinicians, health services, registries, researchers, policymakers and consumer organisations. The following strategic priorities represent key areas for continued focus.

1 Improve Early Recognition

Support initiatives aimed at improving awareness and recognition of cardiovascular symptoms in women to reduce delays in presentation and treatment.

2 Increase Equitable Treatment

Promote equitable utilisation of best-practice procedural approaches, including radial access where clinically appropriate.

3 Target High-risk Women

Strengthen clinical pathways and service models that support patients presenting with greater clinical complexity.

4 Strengthen Data Use

Continue to utilise sex-disaggregated registry data to support benchmarking, monitoring and national quality improvement initiatives.

5 Support Ongoing Collaboration

Encourage continued collaboration between registries, clinicians, consumer organisations and health services to strengthen understanding of women's cardiovascular health nationally.

Clinical quality registries provide a powerful mechanism to support quality improvement, inform practice and improve cardiovascular outcomes for women.

Her Heart acknowledges Traditional Owners of Country throughout Australia and recognises the continuing connection to lands, waters and communities. We pay our respects to Aboriginal and Torres Strait Islander cultures, and to Elders past and present of all communities who also work and live on this land.

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