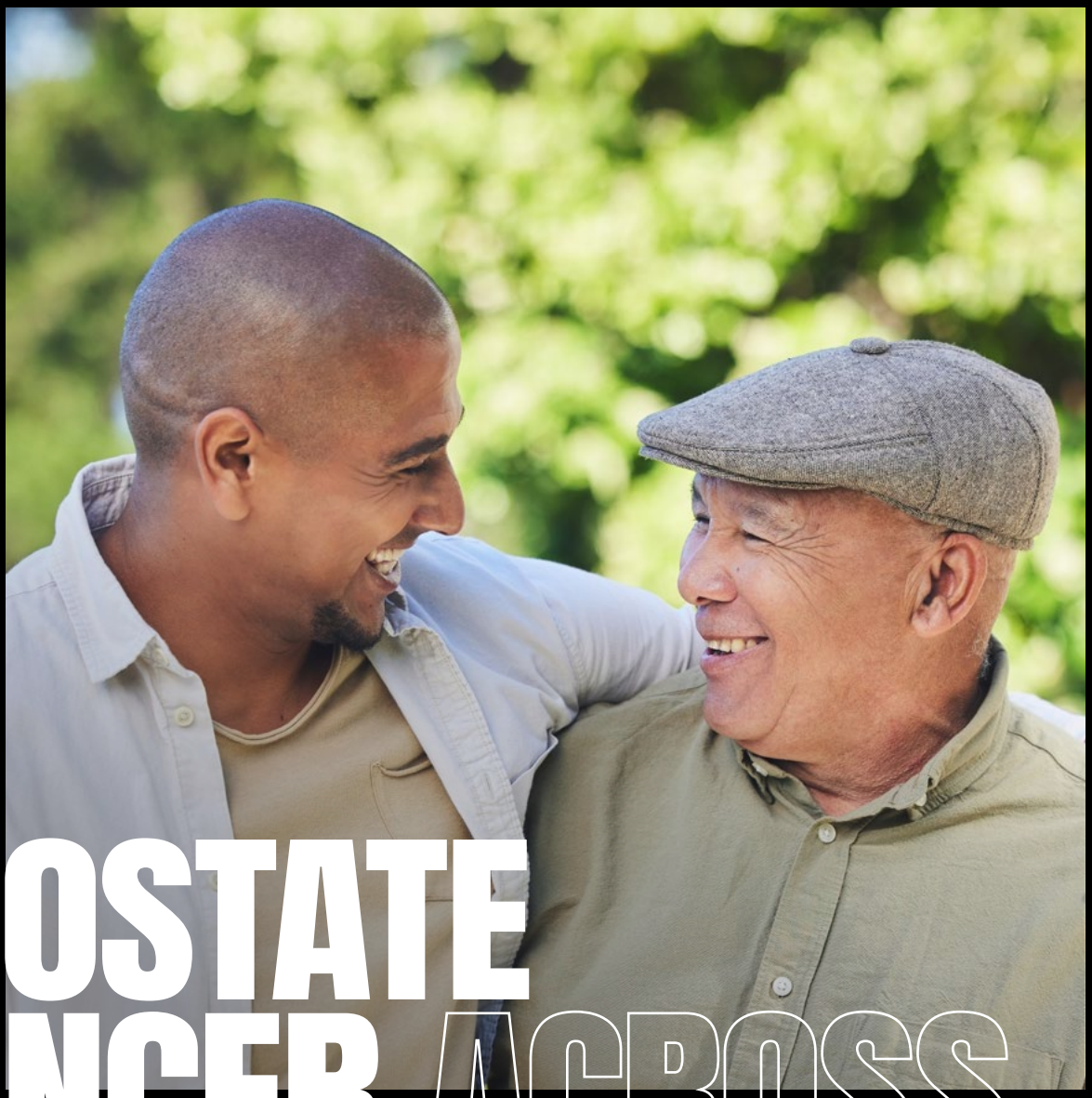
PROSTATE CANCER OUTCOMES | REGISTRY AUSTRALIA AND NEW ZEALAND



PROSTATE CANCER ACROSS AUSTRALIA AND NEW ZEALAND

ANNUAL REPORT 2024

PCOR-ANZ 2020–2022
Patterns of care and patient-reported outcomes.

MOVEMBER® | MONASH University

THE PCOR-ANZ ANNUAL REPORT 2024

This report was produced on behalf of the Australia and New Zealand Prostate Cancer Outcomes Registry (PCOR-ANZ) and approved by the PCOR-ANZ Governance Committee.

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ACKNOWLEDGEMENTS

We extend our sincere gratitude to everyone who has contributed to the PCOR-ANZ registry. Your participation is invaluable in helping us better understand and address the challenges faced by individuals affected by prostate cancer. By sharing your data and experiences, you are playing a vital role in advancing best-practice care and driving meaningful improvements, and ultimately enhancing outcomes for others facing a similar journey.

The success of the registry is made possible by the dedication of the clinical community, who generously contribute their time and expertise to support PCOR-ANZ's continued impact. In particular, Movember extends its gratitude to the members of the PCOR-ANZ Governance Committee, chaired by Professor Frank Frizelle, the Data Advisory Committee, led by Professor Sue Evans, and the Advisory Committee, chaired by Associate Professor David Smith. Their unwavering commitment and guidance have been instrumental in shaping this initiative.

We also acknowledge the invaluable contributions of our Jurisdiction Coordinators, data collectors, and the Data Coordination Centre team at Monash University, whose tireless efforts keep PCOR-ANZ running smoothly.

Lastly, we deeply appreciate the continued support of our endorsing societies, including the Urological Society of Australia and New Zealand (USANZ), the Medical Oncology Group of Australia (MOGA), the Royal Australian and New Zealand College of Radiologists (RANZCR), the Royal College of Pathologists of Australia (RCPA), and the Société Internationale d'Urologie (SIU). Their endorsement strengthens our mission and reinforces the importance of this initiative.

Any enquiries about this report should be directed to:

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MOVEMBER®

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ACT Government | ACT Health

ACT Government | Canberra Health Services

University of Tasmania | Menzies Institute for Medical Research

Cancer Institute NSW
cancer.nsw.gov.au

APCRC-Q Australian Prostate Cancer Research Centre Queensland

CHOMNZ | centre for health outcome measures new zealand

QUT ihbi Institute of Health and Biomedical Innovation

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Monash University

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SA Health

SA-PCCOC
South Australian Prostate Cancer Clinical Outcomes Collaborative

PCOR-ANZ is endorsed by:

Urological Society of Australia and New Zealand

The Royal Australian and New Zealand College of Radiologists
The Faculty of Radiation Oncology

Société Internationale d'Urologie SIU

RCPA
The Royal College of Pathologists of Australasia

MOGA

Please refer to each jurisdiction's website for a full list of contributing organisations.

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MESSAGE FROM THE CHAIR

This 2024 Annual Report outlines the key findings and trends, and points to the future direction of the bi-national prostate cancer registry. The aim of cancer registries such as PCOR-ANZ is to improve patient care and survival. As is often said *"If you don't measure something it is hard to manage it"*. The registry puts numbers to ideas and concepts and allows those involved to better manage the issues around diagnosis, treatment and follow up as well as providing insight to patients about what various treatment choices could mean to them.

At the present time, the registry has data on almost 175,000 men, making it one of the largest prostate cancer registries in the world. This report emphasises the results of the 3 years 2020–2022, describing various aspects of patient care relating to issues of healthcare service delivery, patient outcomes, and systemic challenges, with a particular emphasis on variations in treatment and disparities in patient outcomes.

The annual number of men registered in PCOR-ANZ increased from 17,247 in 2020 to 20,550 in 2022, this is despite the impact that the COVID pandemic had on healthcare access and provision. There has been a substantial increase in older registrants, with those over 75 years increasing from 22% of new registrations in 2020, to 25% in 2022. It is not just the quantity of the data that is excellent, but also the quality; with the data completeness for most sections of the report being over 97%.

The report demonstrates an increase in use of pre-biopsy MRI from 5.6% in 2015 to 73% in 2022, especially in the Australian Capital Territory (ACT; 91%), followed by Queensland (QLD; 87%) and Victoria (VIC; 83%).

This report also raises several differences that are not easy to explain. Such as why do patients with a T2 or T3/4 prostate cancer have such variation in positive margins (for each technique; open, laparoscopic or robotic) related to whether the surgery is undertaken in the public or private sector? For example, a robotic prostatectomy for a T2 tumour in the private sector has a 12.6% risk of positive margins. However, the same case in the public sector has a 50% higher positive margin rate, at just under 17.6%. Such variation is similar in most techniques for most stages. It is this sort of variation in treatment that the registry is able to highlight; and as such, allows clinicians, health-funders, -policy-makers, and -service-providers, to consider this and to adapt.

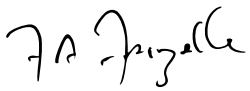
Understanding healthcare through the eyes of the patient is crucial for improving overall service delivery. When patients feel heard and understood, they are more likely to adopt treatment plans, attend follow-ups, and engage in preventive care. From a patient's perspective, disparities in outcomes can lead to feelings of helplessness and anxiety. Many patients express concerns about the fairness of the system and whether they are receiving the best possible care. As such, the patients' lived experience data that we collect as patient-reported outcome measures (PROMs) can provide real insight into the actual experiences of men with prostate cancer and the impact of treatment on their quality of life.

Across 2020–2022, 17% of men with a low-risk prostate cancer who had surgery leaked urine once per day, and 27% needed to wear a pad one-year after treatment In general, men with low-risk prostate cancer also had considerably impaired sexual function, with moderate-to-big bother being reported in 1 in 4 men (27%) regardless of management strategy. Furthermore, in the low-risk group who had surgery, a substantial impact on sexual function was reported post operatively; with only 33% of patients reporting a fair-to-good erection – meaning that 2-in-3 patients experienced significant difficulties with sexual function after surgery. This sort of information on patients' lived experience allows those with prostate cancer to understand what to expect after treatment and helps guide their treatment choices. This also highlights the need for healthcare providers to engage with patients effectively, ensuring that treatment plans are personalised, explained thoroughly, and understood.

The data collection that forms the basis of this report is only possible because of the support of the patients, doctors and staff involved in running the registry. It is important to acknowledge the financial support of Movember, without which the quality registry as we know it, could not exist.

Conclusion

The 2024 Annual Report highlights both progress and ongoing challenges in the management of prostate cancer. While advancements in treatment and diagnosis are improving patient care, significant disparities remain. Addressing these variations through management protocols, decision-making algorithms and increased education, as well as appropriate investment in healthcare infrastructure and policy choices, will help achieve better health outcomes for all patients. Most importantly, integrating the patient perspective into healthcare decision-making ensures that care is not only effective, but also compassionate, accessible, and patient centred.



PROFESSOR FRANK A. FRIZELLE ONZM
MBChB, MMedSc, FRACS, FACS, FASCRS,
FNZMA, FAMA (hon) FRCSI (hon), FRCSEd (hon)
Chair PCOR-ANZ Governance Committee

MESSAGE FROM MOVEMBER

Movember is proud to have invested over $28 million in the Prostate Cancer Outcomes Registry of Australia and New Zealand (PCOR-ANZ) since 2015, supporting the growth and maturity of this unique national dataset that drives improved quality of care and outcomes. With PCOR-ANZ now having an overall population coverage of 72% and almost 175,000 men enrolled, we can be confident in its ability to identify variations and disparities in care, and to improve outcomes for men living with prostate cancer across Australia and New Zealand. We could not have achieved this without the participation of all the patients and clinicians over the past decade, and we are very thankful for your continued engagement.

Over the past year, PCOR-ANZ data has informed multiple scientific publications, produced benchmarked reports for clinicians and hospitals, a new annual PCOR-ANZ companion report, as well as contributing to The Real Face of Men's Health Aotearoa New Zealand report and the Clinical Practice Guidelines for the Early Detection of Prostate Cancer in Australia. This work demonstrates how real-world data, like PCOR-ANZ, is a valuable quality improvement and research tool that can improve care delivery standards, clinical guidelines, and optimise outcomes for men living with prostate cancer.

This year we are excited to welcome Western Australia to PCOR-ANZ for the first time. While data from these patients does not appear in this report, we look forward to future reports where data is presented from all Australian Jurisdictions and New Zealand, making PCOR-ANZ a wholly bi-national registry.

Patterns of care

The data in the PCOR-ANZ reports show positive changes in patterns of care over time and adoption of best-practice pathways. Over the past seven years we have seen an increase in men with low-risk disease being managed by Active Surveillance, up from 66% in 2015 to 85% in 2022. This highlights the clinical practice improvements that have occurred, helping to ensure that men with prostate cancer are not over- or under-treated, and receive the right treatment at the right time. Appropriate and personalised treatment pathways are critical, especially with the growing incidence of prostate cancer expected over the next decade, and remain a core focus area for Movember.

Patient-reported Outcomes

The collection of patient-reported outcomes is central to PCOR-ANZ and imperative to understand the impact on the men who are living with prostate cancer. Similar to previous years, in this report we see high levels of sexual bother, poor sexual function, urinary incontinence, and feelings of depression associated with prostate cancer treatments, which mostly vary by disease stage and management. Ensuring widespread adoption of patient-reported measures across the cancer pathway is key to understanding the needs and impacts on each person navigating prostate cancer and to enable a more personalised approach to treatment and support. PCOR-ANZ continues to model how patient-reported outcomes can be collected and used to deepen our understanding and knowledge, as well as improve outcomes for men with prostate cancer.

Health Equity

In addition to this annual report, in 2025 we will see the delivery of the first PCOR-ANZ inequities and disparities report, which will focus on disparities in clinical management and outcomes. With this knowledge, Movember and other organisations will be able to advocate on behalf of patients and clinicians to ensure that no matter who you are, where you live, or where you are treated, that access to best-practice care is provided. The PCOR-ANZ data will highlight where more efforts are needed to improve outcomes for all.

The future

The PCOR-ANZ registry is a valuable asset for Australia and New Zealand and strengthens our understanding of clinical and patient-reported outcomes of men with prostate cancer. Working alongside the PCOR-ANZ Governance Committee, clinicians and other organisations, we aim to support increased recognition of this unique dataset to support research and quality improvement. Our aim is to continue to drive improvements in outcomes for men with prostate cancer, so that men can live well during and beyond their prostate cancer.

SARAH WELLER
MSc, BAppSci(ExSci)
Global Director, Prostate Cancer
Movember

CONTENTS

ABBREVIATIONS

ABS
Australian Bureau of Statistics

ADT
Androgen-deprivation therapy

AIHW
Australian Institute of Health and Welfare

AS
Active surveillance

EPIC-26
Extended Prostate Cancer Index Composite-26 questions

EQD2
Equivalent dose in 2-Gy fractions

IRSAD
Index of relative socio-economic advantage and disadvantage

ISUP
International Society of Urological Pathologists

MRI
Magnetic Resonance Imaging

MMM
Modified Monash Model

NCCN
National Comprehensive Cancer Network

OCCP
Optimal Cancer Care Pathway

PSMA PET-CT
Prostate-specific membrane antigen positron emission tomography and computer tomography

PCOR-ANZ
Australia and New Zealand Prostate Cancer Outcomes Registry

PLEx
People with Lived Experience

PROMs
Patient-reported outcome measures

PSA
Prostate-specific antigen

RT
Radiation therapy

SA
South Australia

SEIFA
Socio-economic indexes for area

SES
Socio-Economic Status

TNM
'Tumour/node/metastasis' staging system

TP
Transperineal biopsy

TR/TRUS
Transrectal biopsy / transrectal ultrasound guided biopsy

TURP
Transurethral resection of the prostate

Tx
Treatment

WW
Watchful waiting

EXECUTIVE SUMMARY

Since its inception in 2015, the Australia and New Zealand Prostate Cancer Outcomes Registry (PCOR-ANZ) has continued to expand its data collection and has accumulated data on a total of 114,716 men diagnosed up until the end of 2022. In 2022 specifically, the estimated PCOR-ANZ population coverage was 72%* overall, comprised of 70% and 83% for Australia and New Zealand respectively (**Table S6**). While across the period 2020–2022, 25,875 registrants completed a PROMs instrument at 12 months. In 2024, 258 clinical sites and 411 clinicians participated in the registry. The total number of new registrants entered every year now continues at approximately 20,000 men or more annually; and we will commence collection for PCOR-WA in 2025.

This report focusses on data collected on men with newly diagnosed prostate cancer from Australia and New Zealand for the period January 2020 up until December 2022. Registrants were followed for outcomes data until September 2024. The majority of analysis in this report is restricted to 3 years, rather than for all years covered by the PCOR-ANZ database (which began in 2015) for two reasons. Firstly, diagnostic and treatment modalities have changed significantly over the last decade, and comparing data across more recent years gives a clearer picture of what is happening now. Secondly, more complete coverage of jurisdictions has been a recent achievement; and therefore, comparing data over the later years enables robust comparisons across groups managed in a consistent way in a shorter timeframe. We have included earlier timeframes for comparison where we felt it made a relevant point. Longer-term trends can be seen by comparing the three-year cross section in this report with the longitudinal trends in previous reports.[1]

*The estimated population coverage of PCOR-ANZ is based on current estimated prostate cancer incidence figures from the AIHW[2] and the New Zealand Ministry of Health.[3] Due to recent changes in AIHW calculation methods, the coverage data included for Australia in this report should not be compared with previous population-coverage calculations for PCOR-ANZ. These are rough estimates only and are not suitable for decision making.

KEY FINDINGS

PCOR-ANZ registrations continue to increase over time

56,677
men were registered across 2020-2022
17,247 in 2020 **20,550** in 2022

There is a shift towards older age at diagnosis

Diagnoses in men aged >75 increased from **22%** to **25%** (2020-2022)

In 2022

29% came from rural areas

71% came from metropolitan areas

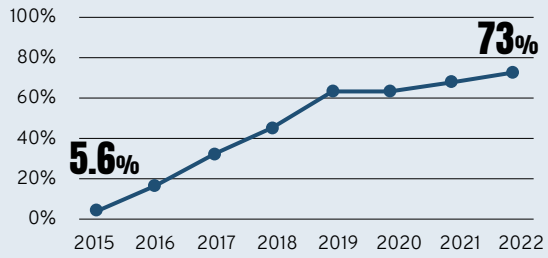
When it comes to diagnosis...

Transperineal (TP) biopsy was the most common method used overall

22% TP Biopsy **64%** TRUS Biopsy

But some jurisdictions are still catching up, NZ (30%) and the NT (17%) had the lowest rates of TP biopsy

Pre-biopsy MRI use is on the rise



85% **of men with low-risk cancer were managed with active surveillance (AS) in 2022 (up from 81% in 2020)**

Most men who start AS are still being managed with AS at 12 months

- Low-risk **95%**
- Intermediate-risk **93%**

69% **of men with high-risk cancer received surgery within 90 days of diagnosis**

Timeliness of surgery differs by disease risk and institution

Tx within 90 days

- **58%** intermediate-risk disease
- **35%** low-risk disease
- **74%** in private setting
- **26%** in public settings

93% **of men treated with EBRT received a 'curative dose' (at least 74 Gy equivalent does in 2 Gy fractions)**

Timeliness of radiation-based therapy by disease risk and institution

Tx within 90 days

- **RT alone** high-risk **32%**
- **RT+ADT** high-risk **82%**
- **RT+ADT** regional disease **87%**
- **RT+ADT** metastatic disease **93%**

Information for transgender and non-binary people

If you are a transgender person or non-binary person who was assigned male at birth, or are intersex, it is important to know you can get prostate cancer. If you feel uncomfortable or distressed at the thought of prostate cancer treatment, it may help to find a doctor in your situation and speak to them for advice. You can contact QLife. Call 1800 184 527 or chat online www.qlife.org.au

46%

Overall PROMs completion 2021–2022 (25,875/56,677)

PROMs responses at 1 year, key findings

Low Risk	Use of one or more incontinence pads per day occurred in…	**27%** of men receiving surgery	**3%** of men on AS
Intermediate Risk	Leaking urine at least once a day occurred in…	**19%** of men receiving surgery	**8%** of men on AS
Intermediate Risk	Sexual bother was reported by…	**26%** of men receiving ADT +/- chemotherapy	**46%** of men who had surgery
High Risk	Fair-to-very-good ability to have an erection was reported by…	**43%** of men on AS **13%** of men receiving surgery	**20%** of men on RT alone **7%** of men on RT+ADT
Regional	Use of one or more incontinence pads per day occurred in…	**17%** of men receiving ADT +/- chemotherapy	**43%** of men who had surgery
Metastatic	Use of sexual aids was reported by…	**43%** of men receiving ADT +/- chemotherapy	**12%** of men who had surgery

For more information, see **Figure 22** and **Table S47** (low-risk); **Table S48** (intermediate risk); **Table S49** (high risk); **Table S50** (regional disease); and **Table S51** (metastatic disease).

ABOUT THIS REPORT

WHAT DATA IS INCLUDED IN THE REGISTRY?

Jurisdictional PCOR collect a minimum clinical dataset relating to the diagnosis, treatment of prostate cancer as well as patient-reported outcomes.

DIAGNOSIS

- Transrectal ultrasound guided biopsy
- Transperineal biopsy
- Transurethral resection of the prostate

CANCER INFORMATION

- Cancer stage
- Gleason score
- Cancer risk category
- Prostate-specific antigen (PSA) levels

TREATMENT

- Treatments provided (e.g. surgery, radiotherapy, chemotherapy, androgen-deprivation therapy)
- Whether active surveillance or watchful waiting protocols were followed
- Disease progression

PATIENT-REPORTED OUTCOME MEASURES (PROMs)

Functional outcomes using the symptom questionnaire (EPIC-26) and questions on libido and use of sexual aids:

- Twelve months following diagnosis for active surveillance or watchful waiting; or
- Twelve months after start of active treatment

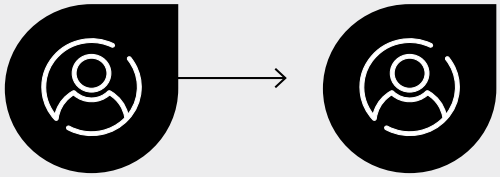
WHEN DO WE COLLECT INFORMATION?

PATIENT MILESTONES

ACTIVE SURVEILLANCE OR WATCHFUL WAITING

12 MONTHS

PROMs collection for patients managed by active surveillance or watchful waiting



DIAGNOSIS MANAGEMENT

ACTIVE TREATMENT

12 MONTHS

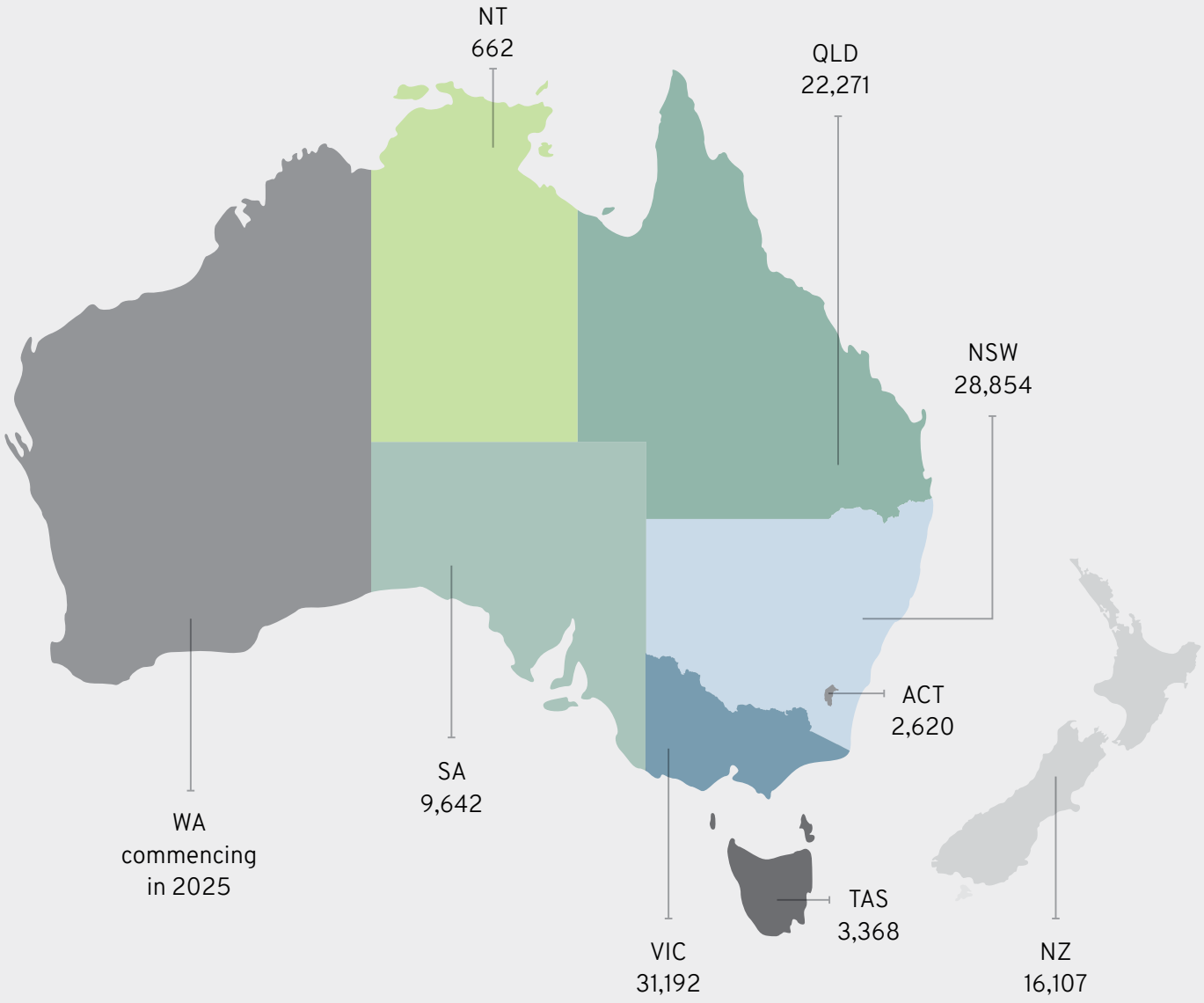
PROMs collection for patients who received active treatment is initiated twelve months after the last component of active treatment.

18 MONTHS

It takes about 18 months to collect the data for people diagnosed in one calendar year

HOW MANY PEOPLE ARE INVOLVED IN PCOR-ANZ?

Men included in the registry and diagnosed between 1st January 2015, and 31st December 2022



411

DOCTORS (2024)

258

HOSPITALS AND CLINICS (2024)

55,815

MEN WHO HAVE COMPLETED A PROM (2015-2022)

114,716

MEN INCLUDED IN THE REGISTRY (2015-2022)

METHODS

PCOR-ANZ DATASET

The Australia and New Zealand Prostate Cancer Outcomes Registry (PCOR-ANZ) is a federated, bi-national registry, incorporating data from State, Territory and National Prostate Cancer Outcomes Registries (PCOR). Detailed recruitment and data collection methodology for the PCOR-ANZ model has been previously reported.[4]

SCOPE OF DATA INCLUDED IN THIS REPORT

For the majority of this report, we have included men who were residents of Australia and New Zealand (NZ) and were diagnosed with prostate cancer between 1 January 2020 to 31 December 2022. Diagnosis, treatment and patient-reported outcome measures (PROMs) data were collected in these men up to 28 September 2024. Assessing a shorter timeframe allows a more up-to-date state-of-the-nations report on the experience of men with prostate cancer now. Given there has been a period of rapid development in diagnostics and treatments since 2015, including earlier data may skew outcomes in a way that does not reflect up-to-date practise. Where relevant, we have included results that incorporate men who lived in Australia and NZ and were diagnosed with prostate cancer between 1 January 2015 to 31 December 2022. Information on data availability for this population (number and proportion)[1] is noted as appropriate. Further information about men who were diagnosed prior to 2020, and insights into the trends and outcomes observed in that population, can be found in previous reports.[1]

REGISTRY ELIGIBILITY

Eligibility to be registered in the PCOR-ANZ database is determined by several inclusion criteria, which are that patients:

1. over 18 years old,
2. live in Australia or NZ, never chosen to opt out.[†]

PROMS

PROMs are captured using the standardised, validated and patient-completed Expanded Prostate Cancer Index Composite (EPIC-26) questionnaire,[5] the Utilisation of Sexual Devices Questionnaire[6] and the libido question assessing interest in sex from the EORTC-QLQ-PR25,[7] as outlined by the International Consortium for Health Outcomes Management (ICHOM).[8]

Baseline PROMs are collected in South Australia (SA), Tasmania (TAS), Northern Territory (NT) and NZ. These are collected up to 90 days after the diagnosis date but prior to the commencement of any active treatment. Baseline PROMs cannot be completed after active treatment has commenced.[8]

Twelve-month PROMs are collected at:

- 12 months after the start date of the most recent radical treatment modality,
- or 12 months after palliative treatment if treated with non-curative modalities,
- or 12 months after diagnosis in those on active surveillance (AS) or watchful waiting (WW).

[†]Patients can indicate whether they wish to remove all or only some of their information as well as whether they do or do not wish to participate in PROMs questionnaires.

PROMs 'completion' was defined as completion of at least one question of the PCOR-ANZ PROMs. Only selected PROMs questions have been focused on in this report. Single questions from the PCOR-ANZ PROMs were defined and dichotomised according to **Table 1**.

TABLE 1: **DESCRIPTION OF PROMS QUESTIONS**

Variable	Definition
Urinary Domain	
Moderate-to-big urinary bother	'Urinary function' reported on EPIC-26 as a 'moderate-to-big problem'*
Use of one or more pads per day	Used one or more pads per day
Leaking urine once or more per day	Leaked urine more than once per day
Bowel Domain	
Moderate-to-big bother	Reported on EPIC-26 as a 'moderate-to-big problem'*
Moderate-to-big problem with loss of bowel control	Reported on EPIC-26 as a 'moderate-to-big problem'*
Sexual Domain	
Moderate-to-big sexual bother	'Sexual function or lack of sexual function' reported on EPIC-26 as a 'moderate-to-big problem'*
Fair-to-very-good ability to function sexually	'Ability to function sexually' is reported as fair/good/very good on EPIC-26 (on a scale of very poor, poor, fair, good, very good)
Erections are firm enough for intercourse	Reported as a 4 on a scale of 1 (none at all) to 4 (firm enough for intercourse) on EPIC-26
Fair-to-very-good ability to have an erection	'Ability to have an erection' reported on EPIC-26 as fair/good/ very good
Sexual aid use	Answered yes to any of: • Question 2 (Have you used any medications or devices to aid or improve erections?) • And/or questions 3A to 3E (specific medications or devices)
Hormonal Domain	
Moderate-to-big problem with lack of energy	Reported on EPIC-26 as a 'moderate-to-big problem'*
Moderate-to-big problem with feeling depressed	Reported on EPIC-26 as a 'moderate-to-big problem'*

Note: *Overall, a moderate-big problem is represented by a score of 3–4 on a scale of 0 to 4; and fair-very good is represented by a score of 3–5 on a scale of 1 to 5.

POPULATION COVERAGE

Estimated population coverage of the PCOR-ANZ dataset is based on the estimated prostate cancer incidence from the Australian Institute of Health and Welfare (AIHW) – Cancer data in Australia – updated (9 December 2024) and the New Zealand Ministry of Health (updated 10 February 2025).[2,3] The prostate cancer incidence estimation method used by AIHW was changed in 2022 to better predict and reflect the aging nature of Australia's population. As a result, the population coverage data included for Australia in this report differs from previous versions of the PCOR-ANZ annual report. At the time of writing this report, reporting of prostate cancer estimated incidence by individual Australian States and Territories was not available for 2021 and 2022. Therefore, for 2021 and 2022, the coverage estimate is for all of Australia (including Western Australia [WA]). The 2021 and 2022 values for NZ are correct at the time of writing. These are only estimates and are not suitable for decision making. For some smaller jurisdictions (ACT and NT), the apparent coverage rate will be >100% and reflects men seeking care in jurisdictions other than where they ordinarily reside.

In this report we refer to all PCOR-ANZ registrants as 'men', but it is important to acknowledge that the data in this analysis encompasses all people who have a prostate and were registered in our database, including members of the LGBTIQA+ community who may use different pronouns and also be affected by prostate cancer, such as transgender women, male-assigned non-binary people or intersex people.

DATA AGGREGATIONS AND ANALYSIS OVERVIEW

For this annual report we have stratified and grouped data according to the following categories:

- age group at diagnosis,
- diagnostic biopsy type,
- management strategy,
- NCCN risk group at diagnosis,
- diagnosing or treating institution type,
- remoteness of residency,
- inferred socioeconomic status,
- timeliness of treatment (receipt of treatment within 90 days of diagnosis).

NATIONAL COMPREHENSIVE CANCER NETWORK (NCCN) RISK CLASSIFICATION

Each prostate cancer diagnosis was categorised based on the National Comprehensive Cancer Network (NCCN) risk classification into the larger categories of low-risk, intermediate-risk, high-risk, regional disease (i.e. spread of cancer to lymph nodes), and metastatic disease, considering TNM-stage, Gleason score of the prostate biopsy, and serum prostate-specific antigen (PSA) level at the time of diagnosis (**Table 2**).[9] We do not sub-divide these categories further in this report, because this grouping is widely used to categorise patients to provide prognostic predictions, guide treatment, and for designing clinical trials. Therefore, in this report, the available NCCN risk categories are collated as follows:

- very-low-risk and low-risk are collectively referred to as 'low-risk',
- favourable-intermediate risk and unfavourable-intermediate risk are collectively referred to as 'intermediate risk',
- high risk and very-high risk are collectively referred to as 'high risk'.

BIOPSY

Methods of prostate cancer diagnosis were categorised as:

- transperineal biopsy (TP)
- transrectal ultrasound biopsy (TRUS)
- other, includes all men who received any of the following at diagnosis:
  - transurethral resection of the prostate (TURP),
  - transurethral resection of bladder tumour,
  - clinical investigation (imaging, PSA),
  - histology of metastatic sites, prostatectomy (radical prostatectomy specimen),
  - cystoprostatectomy (combined bladder and prostate removal),
  - other diagnostic procedures and biopsy taken, but unknown approach (biopsy results were available, but details on the method were insufficient)
- unknown or missing, includes men for whom it is unknown whether a biopsy occurred or data was not collected.

TABLE 2: **NATIONAL COMPREHENSIVE CANCER NETWORK (NCCN) RISK CLASSIFICATION**

NCCN risk category*	Low	Intermediate	High	Regional	Metastatic
Gleason score (ISUP Grade Group)	6 (GG1)	Not grouped into either high or low-risk categories.	8–10 (GG4-5)	Any	N/A
PSA level	*And* <10ng/mL		*Or* >20 ng/mL	Any	N/A
Clinical T Category	*And* ≤cT2a	cT2b/T2c	*Or* cT3a/T3b/T4	Any	Any
Clinical N Category	*And* N0	*And* N0	*And* N0	N1	Any
Clinical M Category	*And* M0	*And* M0	*And* M0	*And* M0	M1

*There is insufficient information (e.g., prostate volume, number or percentage of positive biopsy cores) to differentiate very-low-risk vs low-risk, favourable vs unfavourable intermediate risk, and high vs very-high risk. The granular NCCN risk groups were collated as low-risk, intermediate risk, high risk, regional, and metastatic.

MANAGEMENT STRATEGIES

This report focuses on broad categories of different initial treatment modalities after first diagnosis: surgery, radiation therapy (with or without androgen-deprivation therapy), ADT (with or without chemotherapy), AS and WW.

REMOTENESS (AUSTRALIA ONLY)

The measure of remoteness was derived from Australian residential postcodes based on the Modified Monash Model (MMM) and then aggregated into two broader groups: 'Metropolitan and Regional Centres' and 'Rural Towns and Remote Areas'.[4] 'Metropolitan and Regional Centres' comprises metropolitan areas (MM1) and regional centres (MM2), and 'Rural towns and remote areas comprises large rural towns (MM3), medium rural towns (MM4), small rural towns (MM5), remote communities (MM6) and very remote communities (MM7).

INFERRED SOCIOECONOMIC STATUS (AUSTRALIA ONLY)

Socioeconomic status (SES) was derived from Australian residential postcodes using the Australian Bureau of Statistics (ABS) Socio-Economic Indexes for Area (SEIFA) Index of Relative Socio-economic Advantage and Disadvantage (IRSAD).[10] This was subdivided into quintiles based on the Australian data, with quintile 1 (SES1) being the most socio-economically disadvantaged and quintile 5 (SES5) being the most socio-economically advantaged.

TIMELINESS OF TREATMENT

Timeliness of treatment was assessed using the Australian National Optimal Care Pathway for Prostate Cancer (a similar framework in NZ – the Optimal Cancer Care Pathway [OCCP] – aligns with the Australian version)[11,12] which defines treatment within 90 days of diagnosis as the optimum standard of care. For surgery, timeliness was assessed using the number of days between diagnosis and the surgery date. For radiation therapy, timeliness was assessed using the number of days from diagnosis to the first radiation session. For radiation plus ADT, timeliness was assessed using the number of days from diagnosis to either ADT start or radiation start, whichever came first. Timeliness was then categorised as 90 days or less, or 91 days or more.

PREDICTED RATE OF POSITIVE SURGICAL MARGINS

The predicted rates of positive surgical margins were generated using a multivariate logistic regression model. Surgical margins were entered as either positive or negative (unknown, uncertain, abutting, or other were excluded from the analysis). Surgical approach was entered as robot-assisted, open or laparoscopic. Surgeries where there was a conversion to open from laparoscopic or robotic, unknown, or uncertain surgical approaches were excluded from the analysis. The surgical institute type was classified as either public or private. Cases where this information was unknown or uncertain were excluded from analysis. Jurisdiction was entered as a variable to correct for differences in practices across Australia and NZ. The PSA level at the time of surgery was stratified into the following categories: 0 to ≤5, >5 to ≤10, >10 to ≤20, >20 to ≤50, and >50. Pathologic T stage was dichotomised as pT2 and pT3/4 and these categories were analysed separately. The multivariable model produced a risk-adjusted measure of the rate of positive surgical margins after adjustment for the three different surgical methods (robotic, open, laparoscopic) and surgical institute type (public, private). Analysis was performed using StataNow 18.5 (StataCorp, College Station, Texas, USA).

CHAPTER 1

POPULATION CHARACTERISTICS

Between 2015 and 2022 there were 114,716 men with newly diagnosed prostate cancer included in the PCOR-ANZ registry from across Australia and NZ. The annual number of men registered in PCOR-ANZ increased from 17,247 in 2020 to 20,550 in 2022, indicating continuing improvement in the capability of the database to capture prostate cancer cases across Australia and NZ over time **(Figure 1)**.

In 2022, the median age at prostate cancer diagnosis for PCOR-ANZ registrants increased to 69 years, compared with 68.5 years in 2020 (**Table S2**). This is in line with a gradually increasing trend in age at diagnosis since the database began in 2015, when the median age was reported as 67.5 (among 6,676 men registered at that time).[1] Across 2020–2022, the age at diagnosis of included registrants shifted towards older age groups, with the proportions of those diagnosed at <60 years of age decreasing from 17% (2,876/17,247) in 2020 to 15% (3,113/20,550) in 2022, and those aged ≥75 years increasing from 22% (3,723/17,247) in 2020 to 25% (5,036/20,550) in 2022 **(Figure 2, Table S3)**.

The majority of Australian registrants in PCOR-ANZ (71% [11,950/16,893] in 2022) reside in metropolitan or regional centres (MM1 and MM2; **Table S4**). There was a small increase in the proportion of registrants from rural towns and remote areas (MM3–7) from 2020 (28%; 3,890/14,059) to 2022 (29%; 4,943/16,893; **Table S4)**.

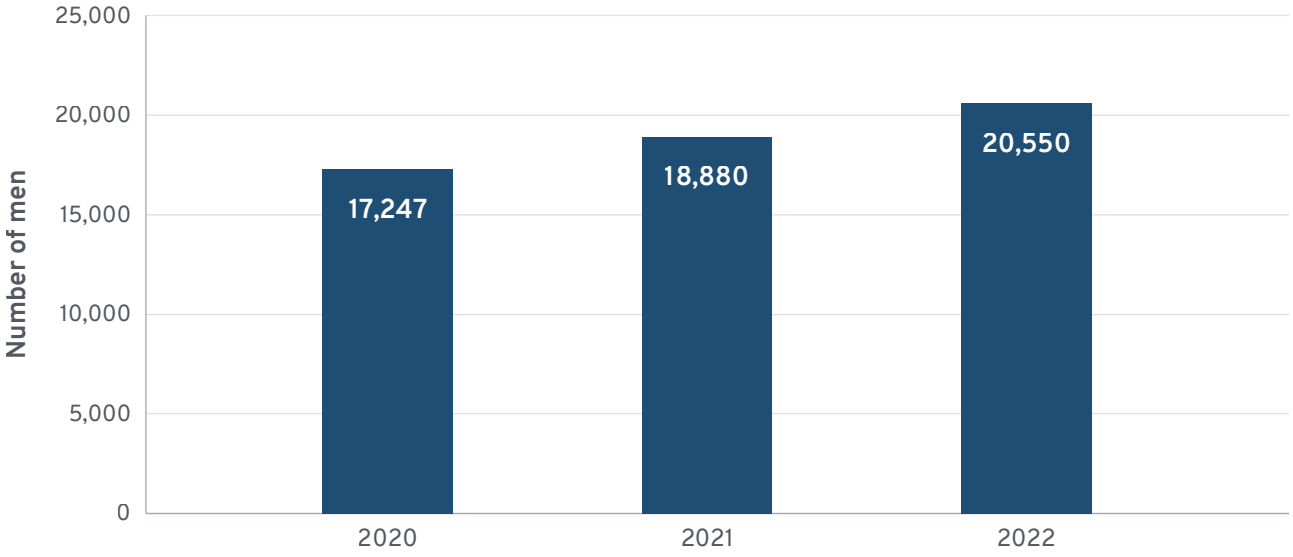
In 2022, 29% (4,953/16,868) of the Australian registrants included in PCOR-ANZ were classified as being in the most socio-economically advantaged group (SES5), and this has been relatively stable over time. In fact, proportions across the groups have remained relatively stable over the 2020 to 2022 reporting period (**Table S5**), which aligns with previous findings.[13]

POPULATION COVERAGE

The estimated bi-national population coverage for PCOR-ANZ in 2022 was 72% (20,550/28,551); and for PCOR-NZ alone in 2022 it was 83% (3,599/4,334). The estimated population coverage for participating Australian States and Territories in 2022 was 70% (16,951/24,217)*.

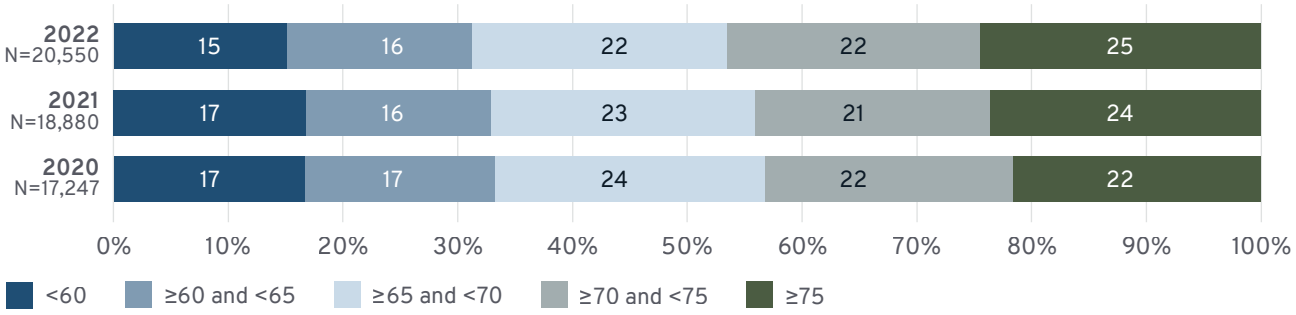
*This estimate was calculated using the national total number of cases, which includes cases recorded in WA; but as PCOR was not operational over 2020–2022 in WA, this may be an underestimate of the true PCOR population coverage in the areas of Australia in which PCOR-ANZ is operational (see Methods for further details). Please refer to Table S6 for more details about estimated annual population coverage.

FIGURE 1: NUMBER OF MEN DIAGNOSED WITH PROSTATE CANCER AND REGISTERED IN PCOR-ANZ PER YEAR (2020–2022)



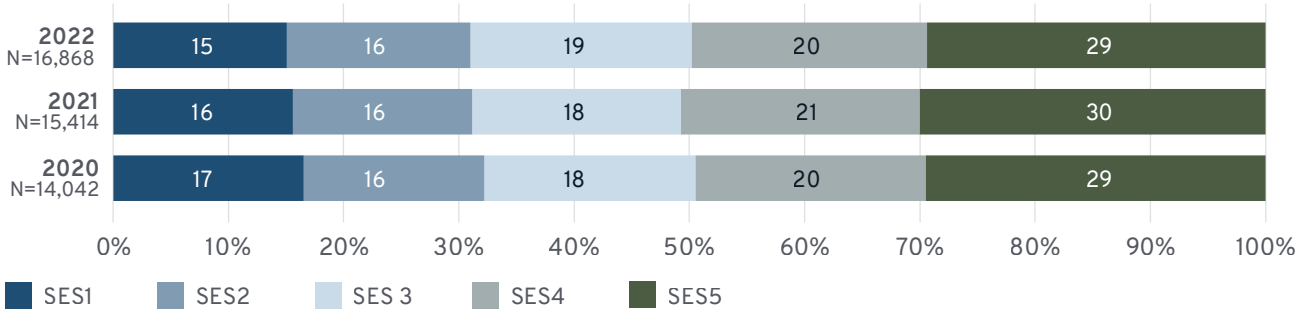
- Diagnosis date was available for 100% (56,677/56,677) of the men in the database.
- For the full data table, refer to Table S1.

FIGURE 2: AGE GROUP AT DIAGNOSIS BY YEAR AS A PERCENTAGE OF TOTAL MEN REGISTERED IN EACH YEAR (2020–2022)



- Proportions per age group at diagnosis are calculated as a percentage of total PCOR-ANZ registrants with available age-group data (from all jurisdictions combined) in each diagnosis year.
- Data on birth date was available for 100% (56,677/56,677) of the men in the database.
- For the full data table, refer to Table S3; percentages are rounded and may not add up to 100%.

FIGURE 3: SOCIOECONOMIC STATUS (SES) QUINTILE DISTRIBUTION FOR AUSTRALIAN RESIDENTS REGISTERED IN PCOR-ANZ, BY DIAGNOSIS YEAR (AUSTRALIA ONLY, 2020–2022)



- Proportions per SES group are calculated as a percentage of all PCOR-ANZ registrants (Australia only) with available SES data for each diagnosis year.
- Data on postcode was available for ~100% (46,324/46,505) of the Australian residents in the database.
- For the full data table, refer to Table S5; percentages are rounded and may not add up to 100%.

CHAPTER 2

DIAGNOSIS OF PROSTATE CANCER

PRE-BIOPSY MAGNETIC RESONANCE IMAGING

Magnetic resonance imaging (MRI) before patients undergo a prostate biopsy has been demonstrated to improve risk prediction and assist in identifying clinically significant cancers.[14] This can help patients with otherwise equivocal diagnostic tests or low-risk cancers avoid unnecessary biopsy procedures. MRI is now recommended by clinical guidelines and professional bodies for various indications including initial assessment of the prostate, reassessment after primary therapy and follow up during AS.[15] The Australian Medicare Benefits Schedule introduced funding for multi-parametric MRI as part of the prostate cancer diagnostic workup in July 2018.[16] We therefore decided to examine how this shift in practice was reflected in PCOR-ANZ data **(Figure 4)**.

Overall, across 2015–2022, there were 99,055/105,074 men registered in PCOR-ANZ with data available on the pre-biopsy MRI of their prostate cancer (94% of all registrants; **Table 14**); while over the 2020–2022 period, this information was available for 47,750/56,677 men (84% of 2020–2022 registrants; **Table 14**). Analysis confirms that use of pre-biopsy MRI increased from 5.6% (318/5,647) in 2015 to 73% (12,230/16,784) in 2022 **(Figure 4)**.

Trends in pre-biopsy MRI uptake across localised and non-localised disease

Across jurisdictions, the highest use of pre-biopsy MRI in localised disease (2020–2022) was in the ACT (91% [986/1,088]), followed by Queensland (QLD; 87% [6,539/7,502]) and VIC (83% [7,044/8,525]). The lowest use among localised cases was in TAS (67% [867/1,288]) and NZ (45% [3,638/8,166]). See **Table S8** and below for more information.

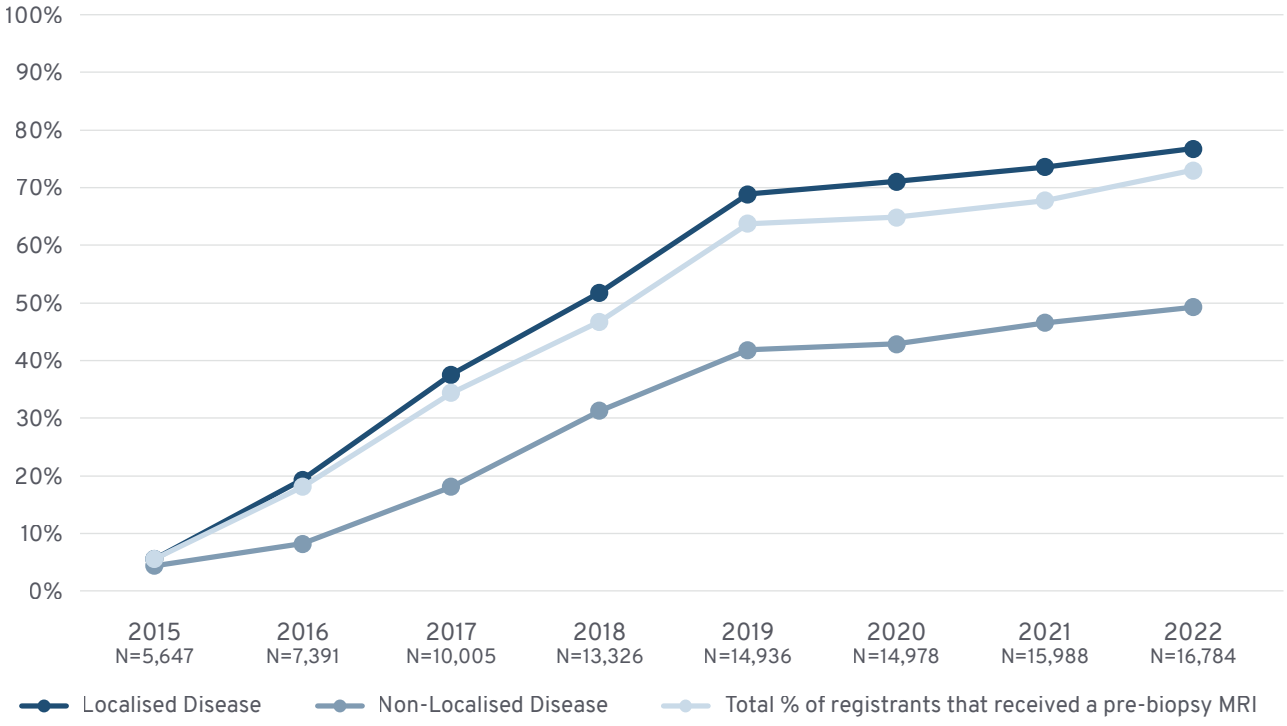
Patients with non-localised disease (regional or metastatic disease) consistently had lower proportions of pre-biopsy MRI, ranging from 37% in TAS (82/221) to 67% in ACT (124/184) over 2020-2022 as a whole (**Table S8**), suggesting that advanced cases follow a different diagnostic pathway, potentially bypassing MRI in favour of alternative staging methods.

Regional disparities in pre-biopsy MRI use

Higher uptake of prebiopsy MRI was observed in ACT, New South Wales (NSW), NT, VIC and QLD, while TAS had moderate use, and NZ had the lowest uptake overall **(Figure 5)**. This variation may reflect differences in healthcare access, clinician preferences, or policy implementation across regions.

Across both localised and non-localised disease, NZ shows the largest shift in MRI uptake between 2020 and 2022 **(Figure 5)**. Over this period, the proportion of patients with localised disease who underwent pre-biopsy MRI increased by a third, while the proportion of patients with non-localised disease using pre-biopsy MRI saw a doubling. This represents the most notable change in MRI adoption across all the PCOR-ANZ jurisdictions, suggesting evolving diagnostic practices in NZ.

FIGURE 4: **PROPORTION OF REGISTRANTS WHO RECEIVED A PRE-BIOPSY MRI BY LOCALISED OR NON-LOCALISED DISEASE (2015–2022)**



- Percentage of pre-biopsy MRI per year was calculated as the percentage of PCOR-ANZ registrants who had any data regarding MRI status at diagnosis. Pre-biopsy MRI was then calculated as MRI dates that were prior to, or on, the date of diagnosis.
- Data on the pre-biopsy MRI of their prostate cancer was available for 94% (99,055/105,074) of men registered in the database between 2015 and 2022 (excluding SA).
- For the full data table, refer to Table S7; data was not available for SA for this analysis.

FIGURE 5: **PROPORTION OF REGISTRANTS WHO RECEIVED A PRE-BIOPSY MRI BY LOCALISED OR NON-LOCALISED DISEASE AND JURISDICTION OR COUNTRY (2020–2022)**

- Percentage of pre-biopsy MRI per year was calculated as the percentage of PCOR-ANZ registrants who had any data regarding MRI status at diagnosis. Pre-biopsy MRI was then calculated as MRI dates that were prior to, or on, the date of diagnosis. Data on the pre-biopsy MRI of their prostate cancer was available for 84% (47,750/56,677) of men registered in the database between 2020 and 2022 (excluding SA).
- For the full data table, refer to Table S8; data was not available for SA for this analysis.

METHOD OF DIAGNOSIS

Transperineal (TP) biopsy is endorsed as the preferred method of diagnosis by The European Association of Urology Guidelines.[17] Targeted TP biopsies demonstrated higher clinically significant prostate cancer detection rates compared with transrectal biopsies, especially for anterior and apical lesions.[18] The TP approach provides a superior safety profile versus the transrectal approach, significantly lowering the risk of infection and rectal bleeding.[19] TP biopsy is also considered to provide greater accuracy when targeting lesions seen on MRI, which in turn supports fewer diagnoses of low-risk disease and improves accuracy in the diagnosis of clinically significant/higher-risk disease.[20]

What are the most common methods of diagnosing prostate cancer overall?

Across the 2020–2022 period, there were 53,812/56,677 men in PCOR-ANZ with data available on the method of diagnosis of their prostate cancer (95% of all registrants; **Table 14**). The data shows that TP biopsy is the most common method of diagnosis overall (**Table 3**) with 73% of diagnoses in Australia and 64% across ANZ being made via TP biopsy. However, this preference was not reflected across all jurisdictions. The highest adoption of TP biopsy occurred in SA (89%), VIC (83%), QLD (73%), and TAS (75%); but was much lower in NZ (27%) and the NT (15%), where transrectal ultrasound-guided biopsy (TRUS biopsy) is more common.

While other methods of diagnosis are available, TRUS biopsy remains the most common alternative to TP biopsy overall; 22% of ANZ diagnoses and 13% of Australian diagnoses used TRUS biopsy across 2020–2022 (**Table 3**). While TP biopsy is the dominant diagnostic method across most Australian states, TRUS biopsy was relied on more heavily in NZ (62%), NT (73%), and ACT (62%). Other diagnosis methods (e.g., TURP or histology from metastatic sites) accounted for 13% of ANZ diagnoses, and was highest, at 19%, in NSW (**Table 3**). These variations likely reflect differences in healthcare resources, clinical practice, and data collection methods.

Choice of biopsy method – TP or TRUS?

TP biopsy is the overall most common method of diagnosis of prostate cancer across PCOR-ANZ (**Table 3**). But TRUS biopsy is still heavily relied on in some areas, despite the support for TP biopsy in current guidelines.[17] So, it is pertinent to consider these two methods of diagnosis alone (excluding 'Other' methods), to understand how the patterns of use of TRUS versus TP biopsy differ across jurisdictions and how these may have changed over time (**Figure 6**; **Table S10**).

Over the three years (2020–2022), 74% (33,576/45,305) of prostate cancer diagnoses in ANZ were made via TP biopsy overall (as opposed to TRUS biopsy). Adoption of TP biopsy was much higher in Australia (85%, 30,809/36,212) compared with NZ (30%, 2,767/9,093) (**Figure 6**; **Table S10**). Over 2020–2022, TP biopsy has steadily increased across all jurisdictions, becoming the dominant method in all Australian states and the ACT by 2022. In 2022, usage exceeded 85% in several jurisdictions, including SA (100%; 989/994), NSW (86%; 4,595/5,330), VIC (97%; 3,015/3,121), QLD (90%; 2,818/3,123), and TAS (88%; 579/660). Lower uptake remains in the NT (23%; 23/98), ACT (66%; 304/461), and NZ (38%; 1,190/3,165), though all jurisdictions have shown increases over time.

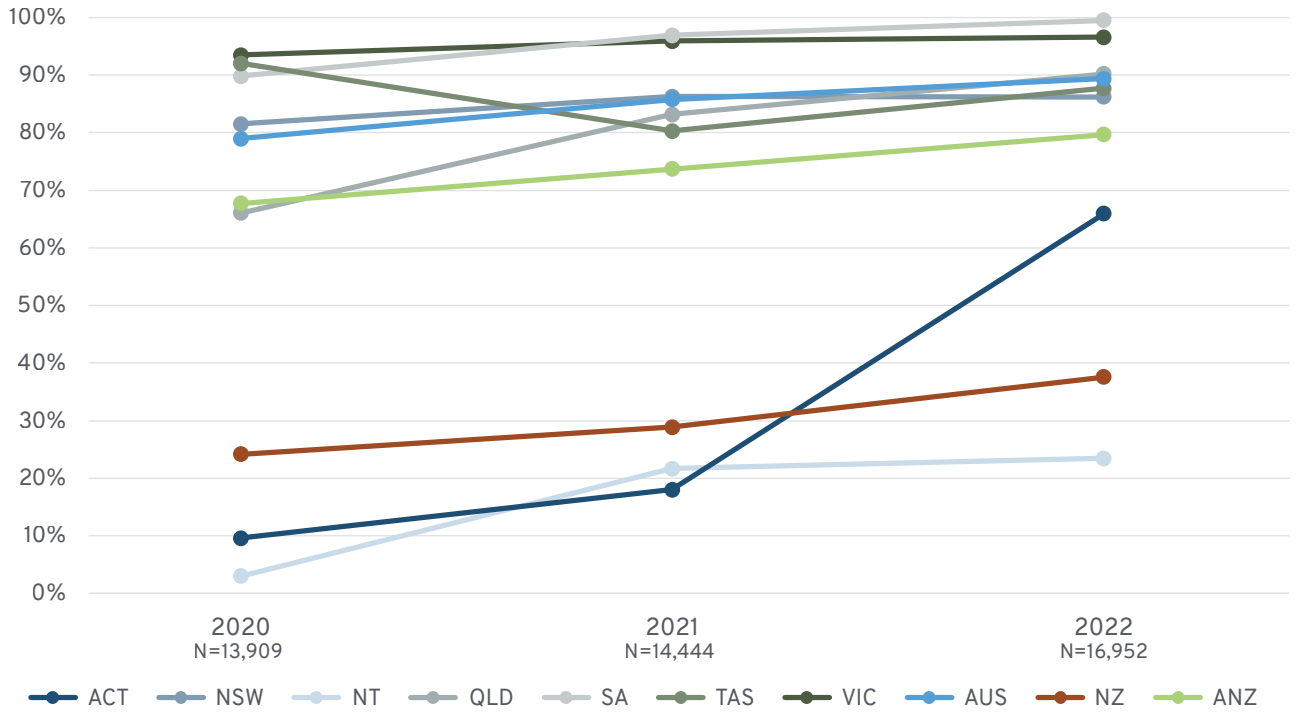
ACT demonstrated a particularly large increase, possibly linked to discussions and advocacy building from the 2020 urological oncology community of practice activity, which utilised PCOR-ANZ data.[21] Comparative levels of adoption of TP biopsy may be influenced by access to private healthcare and health system factors, including availability of appropriate expertise and resources.

TABLE 3: **PROPORTION OF REGISTRANTS RECEIVING A BIOPSY AT DIAGNOSIS, BY METHOD AND JURISDICTION OR COUNTRY (2020–2022)**

	TRUS	TP	Other	Biopsy method unknown or missing
NSW N=15,732	1,891/15,679 12%	10,735/15,679 68%	3,053/15,679 19%	53/15,732 (0.3%)
VIC N=13,881	475/11,611 4%	9,666/11,611 83%	1,470/11,611 13%	2,271/13,882 (16%)
QLD N=9,733	1,703/9,179 19%	6,716/9,179 73%	760/9,179 8%	554/9,733 (6%)
SA N=3,879	93/2,268 4%	2,013/2,268 89%	162/2,268 7%	1,611/3,879 (42%)
TAS N=1,630	194/1,630 12%	1,291/1,630 75%	2,171,630 13%	0/1,630 (0%)
NT N=291	205/282 73%	43/282 15%	34/282 12%	9 /291 (3%)
ACT N=1,359	842/1,358 62%	417/1,358 31%	99/1,358 7%	0/1,359 (0%)
NZ N=10,172	6,326/10,167 62%	2,767/10,167 27%	1,074/10,167 11%	5/10,172 (0.1%)
Aus N=46,505	5,403/42,007 13%	30,809/42,007 73%	5,795/42,007 14%	4,498/46,505 (9.7%)
ANZ N=56,677	11,729/52,174 22%	33,576/52,174 64%	6,869/52,174 13%	4,503/56,677 (8%)

Notes: Percentages are calculated based on known diagnosis method, missing/unknown data is excluded from the calculations for known biopsy methods. Other includes: TURP TURBT, Clinical investigation, histology of metastatic site, cystoprostatectomy, prostatectomy, other, 'Biopsy taken but unknown approach/not stated'. Missing includes registrants with no method of diagnosis recorded or where "unknown diagnosis" was selected.

FIGURE 6: **PROPORTION OF REGISTRANTS DIAGNOSED BY TRANSPERINEAL VERSUS TRANSRECTAL BIOPSY, BY JURISDICTION OR COUNTRY, OVER TIME (2020–2022)**



- Percentage TP biopsy per year was calculated as a percentage of PCOR-ANZ registrants diagnosed by either transrectal biopsy or TP biopsy. Men diagnosed by other methods were excluded.
- Information on method of diagnosis was available for 92% (52,174/56,677) of men registered in PCOR-ANZ, of whom 86% (45,305/52,174) were diagnosed by either TP or transrectal biopsy.
- For the full data table, refer to Table S10.

DIAGNOSTIC PSA

Data on PSA within six months of prostate cancer diagnosis was available on 46,030/56,677 men (81% of all registrants; **Table 14**). Median PSA levels at diagnosis show regional variation across Australia and NZ. The overall median PSA is 7.15 ng/mL in Australia, 8.00 ng/mL in NZ and 7.30 ng/mL in ANZ as a whole (**Table 4**; **Table S11**). The highest median PSA levels were found in the NT (9.00 ng/mL), TAS (8.40 ng/mL), and NZ (8.00 ng/mL), while lower levels were seen in QLD (6.50 ng/mL) and NSW (7.03 ng/mL). The small differences may relate to disease aggression, screening practices or population differences (**Table 4**). However, when making comparisons between jurisdictions, it should be noted that the levels of missing data vary widely for this parameter (TAS 6.4% and NZ 8.2%, versus VIC 30% and NSW 20%; **Table S11**).

It is important to note that the current NZ prostate cancer referral guidelines (from 2015) define abnormal PSA as ≥4.0 ng/L,[22] whereas Australia uses a lower threshold of 3.0 ng/L.[23]

The majority of registrants across the diagnostic years 2020 to 2022 have a diagnostic PSA between 3–10 ng/mL (63% [29,176/46,030]; **Table 5**).

TABLE 4: **MEDIAN PSA WITHIN 6 MONTHS OF DIAGNOSIS, ANALYSED BY JURISDICTION OR COUNTRY (2020–2022)**

Jurisdiction	Median (IQR) PSA ng/mL)
NSW N=12,631	7.03 (5.00–10.80)
VIC N=9,708	7.40 (5.16–11.82)
QLD N=8,127	6.50 (4.60–9.50)
SA N=3,236	7.90 (5.43–12.04)
TAS N=1,526	8.40 (5.90–12.50)
NT N=220	9.00 (5.93–16.00)
ACT N=1,242	7.40 (5.30–11.18)
NZ N=9,340	8.00 (5.50–14.20)
Aus N=36,690	7.15 (5.00–11.00)
ANZ N=46,030	7.30 (5.10–11.40)

Note: For the full data table, refer to Table S11.

TABLE 5: **PROPORTION OF REGISTRANTS PER PSA LEVEL MEASURED WITHIN 6 MONTHS OF DIAGNOSIS (2020–2022)**

	≤3 ng/mL	>3 ng/mL to <10 ng/mL	≥10 ng/mL to <20 ng/mL	≥20 ng/mL to <50 ng/mL	≥50ng/mL
2020 N=14,426	6.0%	63%	19%	7.2%	5.3%
2021 N=15,468	5.8%	63%	18%	7.2%	5.3%
2022 N=16,163	5.4%	64%	19%	7.0%	4.8%
Total N=46,030	5.7%	63%	19%	7.2%	5.1%

Note: For the full data table, refer to Table S12.

ISUP GRADE GROUP

International Society of Urological Pathology (ISUP) uses Gleason scores to define prostate cancer 'grade groups' ('groups') ranging from 1 to 5, which designates how aggressive the cancer appears on histology.[24] The ISUP is an interesting analysis due to its high overall level of data completeness (86%, 48,815/56,677; **Table 14**)

ISUP Group 2 was the most common grade group at diagnosis across 2020–2022, representing 31–33% of cases; while the second most common grade group – ISUP Group 1 – has declined slightly, from 24% in 2020 (3,750/15,558) to 21% in 2022 (3,645/17,156; **Table 6**), with corresponding 1% increases over time in ISUP Groups 3 and 5.

Across the PCOR-ANZ jurisdictions, ISUP Group 2 remains the most common, but there is regional variability in the distribution of grade groups. For example, NZ and TAS have higher rates of low ISUP groups (30% in NZ [2,904/9,751] and 36% in TAS [577/1,598]), possibly due to less frequent use of pre-biopsy MRI, and targeted TP biopsy (**Table 7**).[25] However, the missing ISUP group data varies significantly across jurisdictions. SA and VIC have the highest rates of missing data (60% [2,345/3,879] and 26% [3,575/13,881], respectively), raising concerns about the completeness and comparability of the data. By contrast, NSW, TAS, and NZ have relatively low rates of missing data (1.2% [181/15,732], 1.96% [32/1,630], and 4.1% [421/10,172], respectively), contributing to more reliable grading distributions (**Table S14**).

Overall, the decreasing proportion of ISUP Group 1 disease seen at diagnosis over time may be associated with the increasing use of pre-biopsy MRI and targeted biopsy techniques, which are associated with a higher detection rate of clinically significant prostate cancer.[25]

CLINICAL TNM STAGE

TNM staging for prostate cancer refers to a system used to describe how far prostate cancer has spread, where 'T' stands for the tumour size and extent, 'N' indicates whether the cancer has spread to nearby lymph nodes, and 'M' denotes whether the cancer has metastasised (spread) to distant organs in the body.[26]

There were 32,082/56,677 men with data available on all clinical TNM categories for their prostate cancer (57% of all registrants; **Table 14**). Advancements in imaging technologies, particularly multiparametric MRI, and prostate-specific membrane antigen positron emission tomography and computer tomography (PSMA PET-CT), have enhanced staging and diagnostic accuracy, potentially diminishing the role of traditional clinical T staging practices (i.e. digital rectal examination).[27,28] This may explain why there are high proportions of missing data for the 'TNM' category within PCOR-ANZ. ACT (60% [809/1,359]) and SA (68% [2,651/3,879]) have the highest proportion of missing TNM data. TAS (22% [357/1,626]) and NZ (24% [2,447/10,172]) report the lowest levels of missing data, suggesting more complete TNM documentation. Higher documentation of clinical T category may also reflect lower access to advanced imaging technology (**Table S16**).

Since missing data is more likely in T categorisation, the percentage of node-positive (TxN1M0) and metastatic (TxNxM1) cases may be overestimated, because cases are included irrespective of whether the T is specified or not (for full data tables, see Tables S15 and S16). Understanding the coverage of the TNM data category and how it is changing, is an important step towards making continuing decisions about data collection and analysis for the registry.

TABLE 6: **PROPORTION OF REGISTRANTS PER ISUP GROUP AT DIAGNOSIS (2020–2022)**

	ISUP GROUP 1	ISUP GROUP 2	ISUP GROUP 3	ISUP GROUP 4	ISUP GROUP 5
2020 N=15,558	3,750/15,558 24%	4,786/15,558 31%	2,622/15,558 17%	1,709/15,558 11%	2,691/15,558 17%
2021 N=16,101	3,633/16,101 23%	5,166/16,101 32%	2,841/16,101 18%	1,579/16,101 10%	2,882/16,101 18%
2022 N=17,156	3,645/17,156 21%	5,583/17,156 33%	3,065/17,156 18%	1,823/17,156 11%	3,040/17,156 18%
Total N=48,815	11,028/48,815 23%	15,535/48,815 32%	8,528/48,815 18%	5,111/48,815 11%	8,613/48,815 18%

Note: For the full data table refer to Table S13.

TABLE 7: **PROPORTION OF REGISTRANTS PER ISUP GROUP AT DIAGNOSIS, ANALYSED BY JURISDICTION (2020–2022)**

	ISUP GROUP 1	ISUP GROUP 2	ISUP GROUP 3	ISUP GROUP 4	ISUP GROUP 5
NSW N=15,551	2,854/15,551 18%	5,073/15,551 33%	2,901/15,551 19%	1,731/15,551 11%	2,992/15,551 19%
VIC N=10,306	2,481/10,306 24%	3,512/10,306 34%	1,730/10,306 17%	856/10,306 8%	1,727/10,306 17%
QLD N=8,473	1,388/8,473 16%	2,767/8,473 33%	1,651/8,473 19%	795/8,473 9%	1,872/8,473 22%
SA N=1,534	442/1,534 29%	421/1,534 27%	246/1,534 16%	174/1,534 11%	251/1,534 16%
TAS N=1,598	577/1,598 36%	461/1,598 29%	213/1,598 13%	164/1,598 10%	183/1,598 11%
NT N=270	68/270 25%	50/270 19%	61/270 23%	45/270 17%	46/270 17%
ACT N=1,332	314/1,332 24%	443/1,332 33%	216/1,332 16%	177/1,332 13%	182/1,332 14%
NZ N=9,751	2,904/9,751 30%	2,808/9,751 29%	1,510/9,751 15%	1,169/9,751 12%	1,360/9,751 14%
AUS N=39,064	8,124/39,064 21%	12,727/39,064 33%	7,018/39,064 18%	3,942/39,064 10%	7,253/39,064 19%
ANZ N=48,815	11,028/48,815 23%	15,535/48,815 32%	8,528/48,815 17%	5,111/48,815 10%	8,613/48,815 18%

Note: For the full data table, refer to Table S14.

NCCN CLASSIFICATION

The American National Collaborative Cancer Network (NCCN) classification uses PSA level, Gleason grade and TNM staging to separate patients into well-defined risk groups. These risk groups guide management options such as the choice between active treatment or surveillance, or the need for further diagnostic workup; and provide guidance on prognosis.[9]

There were 45,671/56,677 men with data available on the NCCN risk classification of their prostate cancer (81% of all registrants; **Table 14**). Among the registrants where NCCN risk classification was available, low-risk cases made up 17% (7,727/45,671) of the total known cases, showing a slight decline from 18% (2,613/14,524) in 2020 to 16% (2,554/16,076) in 2022 (**Figure 7**).

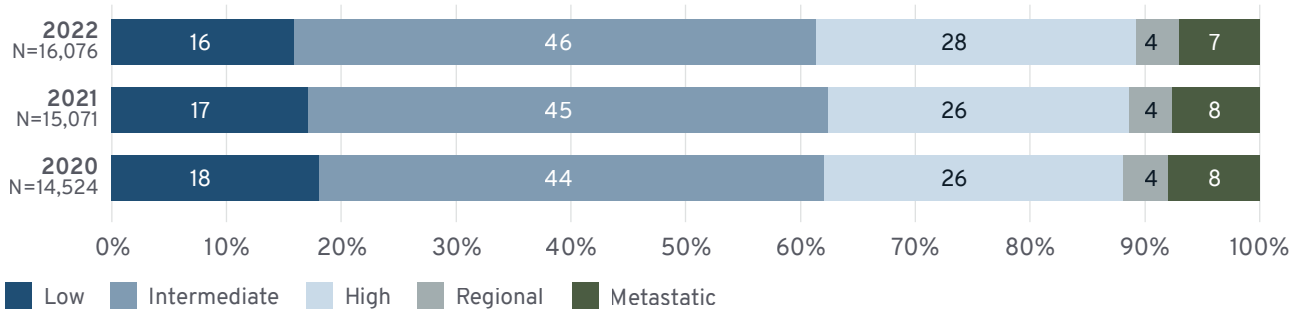
Intermediate-risk cases constituted the most common group, comprising 45% (20,548/45,671) of total known cases (**Table S17**). This proportion remained relatively stable over the three years (44% in 2020 [6,361/14,524], 45% in 2021 [6,837/15,071], and 46% in 2022 [7,350/16,076]; **Figure 7**). High-risk cancer made up 27% (12,231/45,671) of total known cases, with a slight increase from 26% (3,825/14,524) in 2020 to 28% (12,231/16,076) in 2022 (**Figure 7**). There was little change in the proportions classified with regional or metastatic disease, which remained in the range of ~4% and ~8% respectively (**Figure 7**).

NCCN risk groups across jurisdictions and countries, and SES quintiles

Intermediate-risk cases predominate across all regions analysed, ranging from 34% (531/1,576) in SA to 51% (4,147/8,165) in QLD (**Figure 8**). However, high-risk cases show a large variability across regions, ranging from 20% (300/1,536) in TAS to 44% (698/1,576) in SA. At diagnosis, regional and metastatic NCCN risk groups are consistently found at low proportions (<6% and <10% respectively across all regions), with metastatic disease at diagnosis reported at the highest rate in VIC (10%; 1,021/9,925) and NZ (10%; 991/9,521) and lowest in SA (2%; 28/1,576).

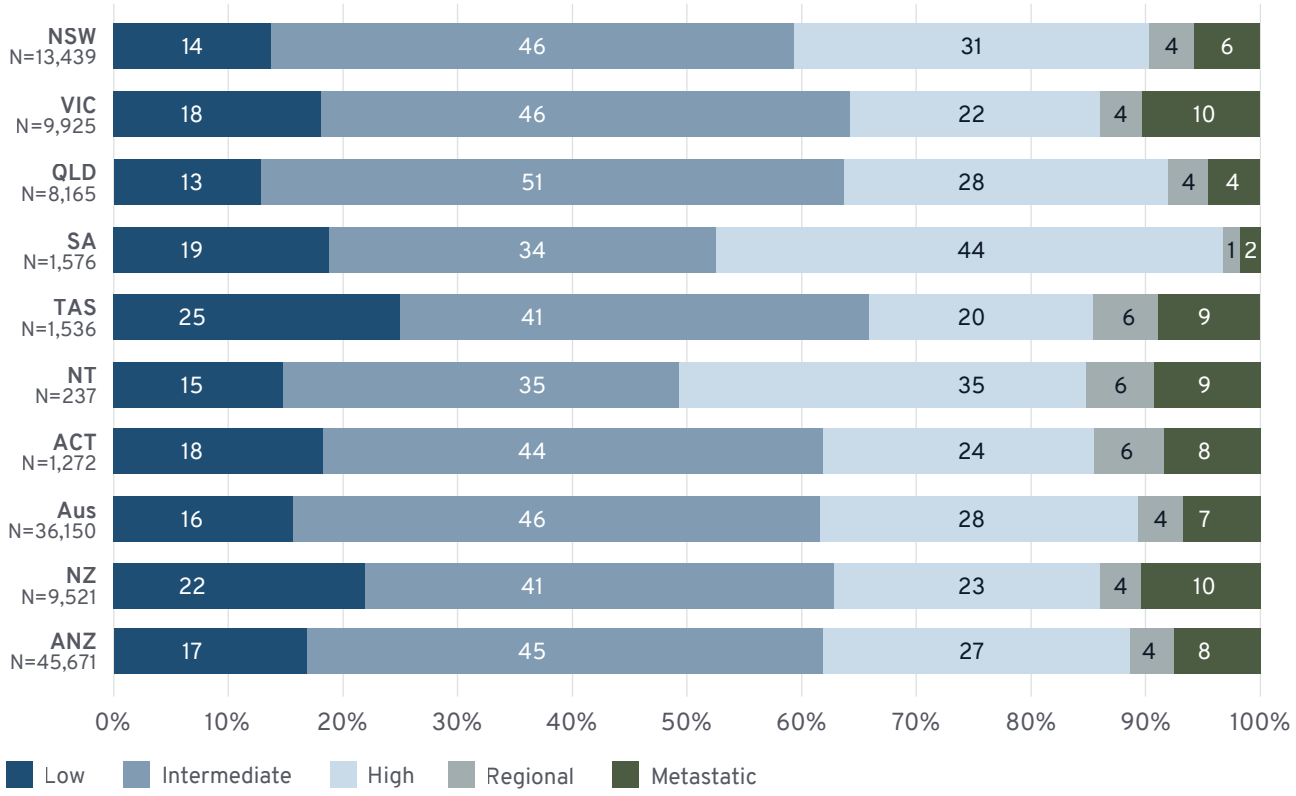
Data on SES is currently only available for Australian residents, and this analysis found that the proportion of men diagnosed with low-risk prostate cancer was relatively consistent across SES groups at 15–16% (**Figure 9**). Intermediate-risk prostate cancer is the most common across all SES groups and shows a slight trend towards more intermediate-risk cases in higher SES groups; with SES5 having the highest proportion (48%; 5,174/10,838) and SES1 the lowest (43%; 2,401/5,568). Furthermore, the proportion of high-risk disease was somewhat higher in SES1 (30%; 1,697/5,568) compared with SES5 (26%; 2,850/10,838), indicating a potential trend in which lower SES groups might be more likely to be diagnosed with higher-risk disease.

FIGURE 7: **PROPORTION OF REGISTRANTS PER NCCN RISK GROUP AT DIAGNOSIS, BY YEAR (2020–2022)**



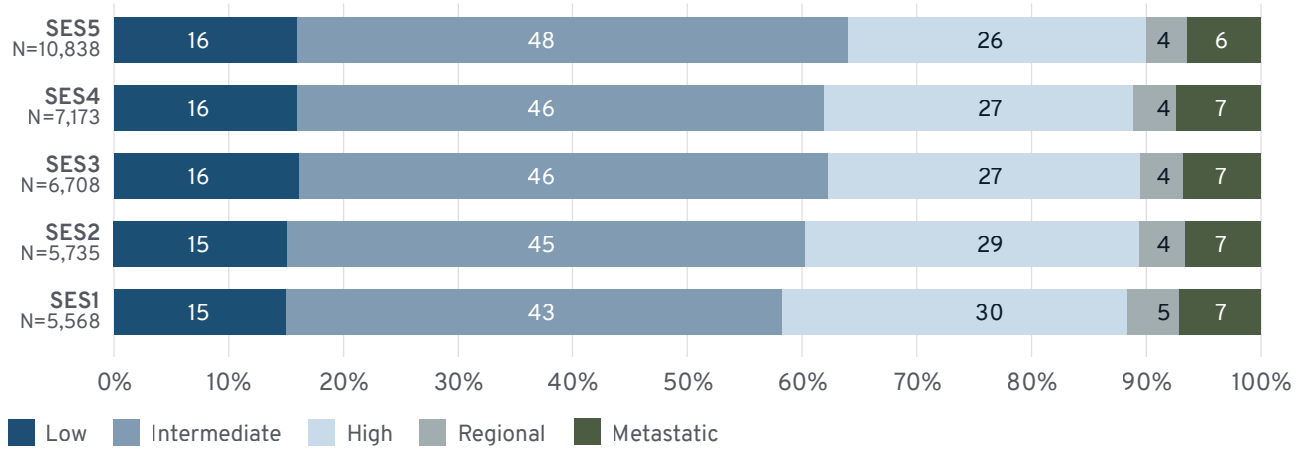
- Percentages per NCCN risk group per year were calculated as a percentage of total PCOR-ANZ registrants in each year who had NCCN data available.
- Information on NCCN risk group was available for 81% (45,671/56,677) of men in the database.
- For the full data table refer to Table S17; percentages are rounded and may not add up to 100%.

FIGURE 8: **PROPORTION OF REGISTRANTS WITH A NCCN RISK GROUP AT DIAGNOSIS BY JURISDICTION OR COUNTRY (2020–2022)**



- Proportions per NCCN risk group are calculated as a percentage of total PCOR-ANZ registrants with available NCCN risk group data in each jurisdiction (from 2020–2022 combined).
- Information on NCCN risk group was available for 81% (45,671/56,677) of men in the database.
- For the full data table, refer to Table S18; percentages are rounded and may not add up to 100%.

FIGURE 9: **PROPORTION OF REGISTRANTS PER NCCN RISK GROUP AT DIAGNOSIS, BY SES GROUP (AUSTRALIA ONLY; 2020–2022)**



- Percentages per NCCN risk group were calculated as a percentage of Australian PCOR-ANZ registrants in each SES group who had postcode data available.
- Information on NCCN risk group was available for 81% (45,671/56,677) of men in the database and information on SES group was available for ~100% (46,324/46,505) of Australian residents in the database.
- For the full data table refer to Table S19; percentages are rounded and may not add up to 100%.

CHAPTER 3

MANAGEMENT OF PROSTATE CANCER

Following a prostate cancer diagnosis, not all men need immediate active treatment. In those who do require active treatment, the treatment options will also depend on their risk group, age, general health and life expectancy, and specific urinary symptoms.[9,29,30] The attitude of the patient towards the potential side effects and convenience of the treatment, and the local availability of options in terms of expertise, technology, and cost are also crucial determinants of the treatment pathway of any given individual. Across 2020–2022, 42,943/56,677 men had data available on both their management strategy and NCCN risk group for their prostate cancer (76% of all registrants).

INITIAL MANAGEMENT PROVIDED BY NCCN RISK GROUP

Low-risk

The proportion of men with low-risk disease who received AS continues to increase from 81% (2,044/2,530) in 2020 to 85% (2,040/2,391) in 2022 (**Figure 10**). There has been an equivalent drop in the number of men receiving surgery for low-risk disease, from 13% (341/2,530) in 2020 to 9% (211/2,391) in 2022. The proportion of men receiving WW has remained the same across 2020–2022 (≤3%; see **Table S20**).

Intermediate risk

The proportion of men with intermediate-risk disease receiving surgery has slightly decreased from 59% (3,594/6,112) in 2020 to 56% (3,782/6,801) in 2022 (**Figure 10**). The proportion of men with intermediate-risk disease receiving radiation therapy alone has concomitantly increased (from 14% in 2020 [848/6,112] to 18% in 2022 [1,206/6,801]), while the proportion of men receiving RT with ADT has remained stable (9% across 2020–2022). The proportions of men receiving either AS (13–15%), ADT +/– chemotherapy (1–2%) and WW (~2%) has remained consistent across these analysis years.

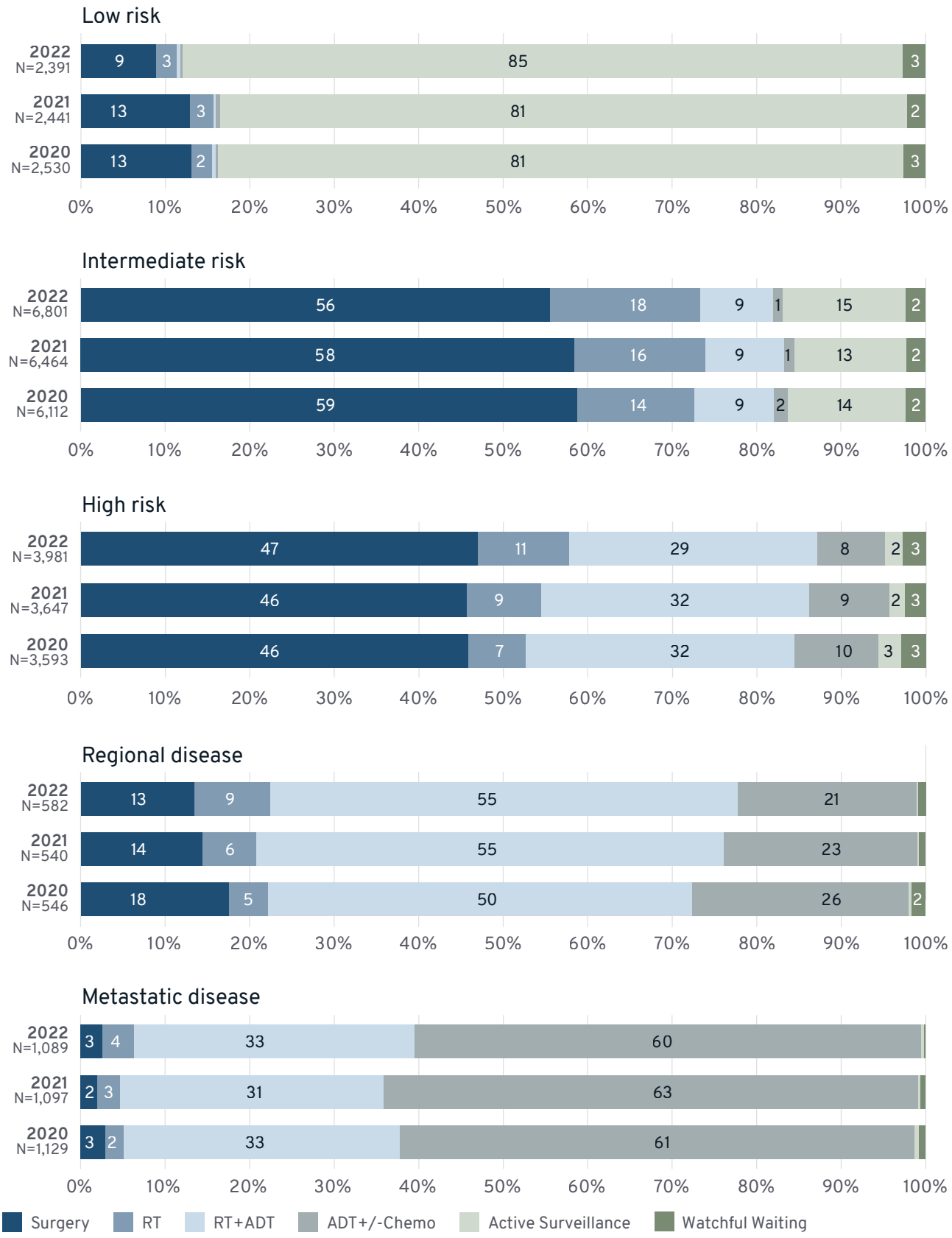
High risk

The proportion of men with high-risk disease receiving surgery (46–47%) has remained relatively consistent over 2020–2022. Multiple randomised trials have shown that, in men with high-risk prostate cancer, the addition of ADT to RT for at least a year improves overall survival.[13,31,32] However, over the reporting period, the proportion of men with high-risk disease who were treated with RT+ADT decreased from 32% (1,145/3,593) in 2020 to 29% (1,165/3,981) in 2022, whereas the proportion of men with high-risk disease who were treated with RT alone increased from 7% (243/3,593) in 2020 to 11% (428/3,981) in 2022 (**Figure 10**).

Regional and metastatic disease

The proportion of men with regional disease receiving RT (+/–ADT) increased from 55% (299/546) in 2020 to 64% (373/582) in 2022 (**Figure 10**). The proportion of men with regional disease receiving ADT +/–chemotherapy decreased slightly from 26% (140/546) in 2020 to 21% (125/582) in 2022. In men with metastatic disease (**Figure 10**), 2–3% received surgery; 35–37% received RT +/–ADT; and 60–63% received ADT +/–chemotherapy with no clear trend over time.

FIGURE 10: **INITIAL MANAGEMENT PROVIDED, BY NCCN RISK GROUP AND YEAR (2020–2022)**



- Proportions per management group per year are calculated as a percentage of PCOR-ANZ registrants from that year and NCCN risk group who had available management data (from all jurisdictions combined).
- Information on NCCN risk group designation was available for 81% (45,671/56,677) men in the database; 43,454 of whom had management data available (95.2% of men with NCCN risk group data available).
- For the full data table, refer to Table S20; percentages are rounded and may not add up to 100%; values <1.0% are not annotated.

ACTIVE SURVEILLANCE

Multiple evidence-based national prostate cancer management guidelines recommend AS as the preferred option for patients with low-risk prostate cancer,[11,33] and this is also recognised as one of the quality indicators adopted by PCOR-ANZ.[34]

There were 10,704/56,677 men with data available on receipt of AS for their prostate cancer (22% of all registrants); and 9,032/10,704 men with data available on both AS and NCCN risk group for their prostate cancer (84% of registrants on AS).

Higher proportions of men with low-risk disease are managed with AS (81–85%), compared with men with intermediate-risk disease (<17%); and this is consistent across all age groups (**Table 8**).

In men with intermediate-risk disease, there is an increasing proportion of men who are being managed with AS as their age group increases (**Table 8 and Table S21**) from 9% (333/3,573) of men aged <60; to 16% (676/4,150) of men aged ≥70 to <75.

ISUP Group and AS management over time

Over the reporting period, there was an increasing proportion of men with ISUP Group 1 cancer who were being managed with AS over time, changing from 79% (2,354/2,986) in 2020 to 84% (2,362/2,825) in 2022 (**Table 9**). The proportions of men with a diagnosis of ISUP Group 2 who are managed with AS remained stable over the reporting period at about 14%.

Switching from active surveillance to active treatment

Considering the 2020–2022 PCOR-ANZ data, at 12 months after diagnosis, the vast majority of men with low- or intermediate-risk disease who commenced AS, remained on AS (93–95%; **Table 10**). Leaving only a small proportion of men with low-risk (4.6%; 291/6,358) or intermediate-risk disease (6.7%; 194/2,897) who 'switched' to an active treatment (i.e. surgery, RT or ADT).

Among men with low-risk disease, 4% (256/6,358) of men switched to an active treatment between 6 and 12 months after starting AS; and the cumulative switching rate at 1 year remains low (4.6%; **Table S23**). Across earlier time points (<6 months from diagnosis), very few men switch treatments (<1%). Among men with intermediate-risk disease, slightly more switching occurs at earlier timepoints, with 3.4% (98/2,897) of men switching to an active treatment between 3 and 9 months after starting AS (**Table S23**). The cumulative switching rate at 12 months is lower in men with low-risk disease (4.6%; 291/6,358) compared with men with intermediate-risk disease (6.7%; 194/2,897).

TABLE 8: **PROPORTION OF REGISTRANTS RECEIVING ACTIVE SURVEILLANCE BY NCCN GROUP AND AGE GROUP (2020–2022)**

	<60	≤60 to <65	≤65 to <70	≥70 to <75	Total
Low	1,644/2,031 80.95%	1,364/1,640 83.17%	1,643/1,940 84.69%	949/1,139 83.32%	6,067/7,362 82.41%
Intermediate	333/3,573 9.32%	397/3,591 11.06%	619/4,931 12.55%	676/4,150 16.29%	2,702/19,377 13.94%

Note: For the full data table, refer to Table S21.

TABLE 9: **PROPORTION OF REGISTRANTS WITH LOW-, INTERMEDIATE- OR HIGH-RISK PROSTATE CANCER WHO RECEIVED AS BY ISUP GROUP (2020–2022)**

	ISUP GROUP 1	ISUP GROUP 2
2020	79% (2,354/2,986)	14% (551/4,042)
2021	80% (2,280/2,863)	13% (541/4,278)
2022	84% (2,362/2,825)	14% (638/4,505)

Note: Only patients classified to low-/intermediate-/high-risk disease, who received AS, and who had an ISUP Group of 1 or 2 appear here.

TABLE 10: **PROPORTION OF REGISTRANTS WHO INITIALLY RECEIVED ACTIVE SURVEILLANCE AND DIDN'T SWITCH TO ACTIVE TREATMENT WITHIN 12 MONTHS OF DIAGNOSIS (N=9,255)**

	12 months
% Registrants with low-risk disease on AS (N=6,358)	95% (6,067/6,358)
% Registrants with intermediate-risk disease on AS (N=2,897)	93% (2,703/2,897)

Note: For the full data table, refer to Table S23. Active treatment is defined as receipt of surgery, RT or ADT.

TIMELINESS OF INITIAL ACTIVE TREATMENT

When considering the type of treatment that should be received, surgery (or radical prostatectomy) is recognised in consensus guidelines as one of the treatment options for localised stages of prostate cancer (among low to high NCCN risk groups).[9,11] RT is recognised as being just as effective, but side-effects differ.[35]

The Australian Optimum Care Pathway for prostate cancer states that surgery should be conducted, or RT should begin, within three months (or 90 days) of diagnosis.[11]

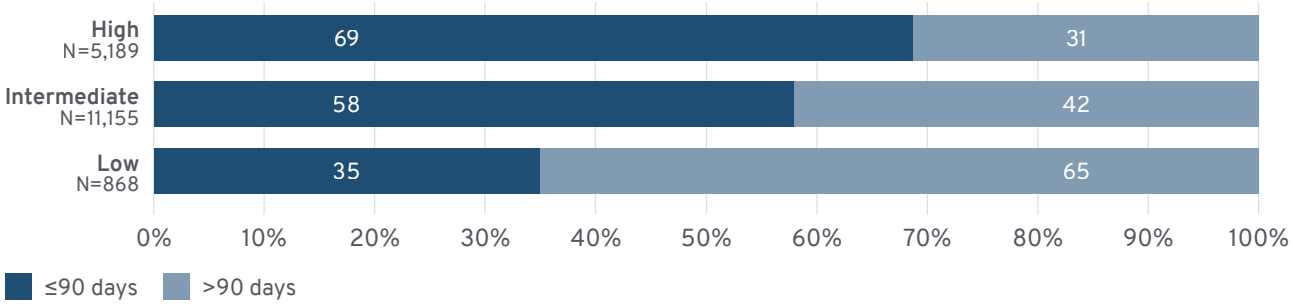
In NZ, the Optimal Cancer Care Pathway also states a 90-day metric for surgery, which will allow comparisons with Australian patterns of care.[12] Since the 90-day timeframe is a 'target' in Australia and NZ, it may be prioritised as a management metric. NZ OCCP also has a 4-week metric for high-risk disease, indicating timeliness is important in this risk category.

TIMELINESS OF SURGERY

There were 19,167/56,677 men with data available on receipt of surgery for their prostate cancer (34% of all registrants); of these men, 92% (17,550/19,167) had an assigned NCCN risk group.

Assessment of timeliness of treatment by NCCN group showed that in men with high-risk disease, almost 70% (3,565/5,189) received surgery within 90 days; leaving one third of men (31%; 1,624/5,189) who received surgery >90 days post diagnosis (**Figure 11**). Overall, as might be expected, men with high-risk disease are having comparatively more timely treatment.[36,37] Among men with intermediate-risk disease, 42% (4,690/11,155) did not receive guideline-concordant care, having had surgery >90 days post diagnosis. In low-risk groups, the rates of men having treatment within 90 days is lower than in other risk groups: 35% (303/868) of men with low-risk disease who were undergoing surgery received it within 90 days of diagnosis, while 65% (565/868) of men in whom surgery was received, had it >90 days post diagnosis.

FIGURE 11: **PROPORTION OF REGISTRANTS RECEIVING SURGERY WITHIN 90 DAYS OF DIAGNOSIS, BY NCCN GROUP (2020–2022)**



- PCOR-ANZ registrants who had an NCCN risk group, received surgery as initial therapy, and for whom timeliness could be calculated were dichotomised into groups receiving surgery ≤90 days and >90 days post diagnosis.
- 40.4% (17,550/43,454) of registrants had an NCCN risk group and received surgery; and of these men, 98.1% (17,212/17,550) had low-, intermediate-, or high-risk disease and had data on timeliness available.
- For the full data table, refer to Table S24; percentages are rounded and may not add up to 100%.

Timeliness of surgery by treating institute (ANZ, Australia and NZ)

There were 18,976/19,167 men with data available on receipt of surgery and type of treating surgical institute for their prostate cancer (99% of men who received surgery) and 93% (17,505/18,796) also had an NCCN risk group available.

Across PCOR-ANZ, 74% (13,846/18,810) of men who received surgery were treated in private institutes and 26% (4,964/18,810) were treated in public institutes (**Table S25**). Considering only localised prostate cancer risk groups, across PCOR-ANZ, private institutes have consistently higher proportions (45–81%) of surgeries performed within 90 days of diagnosis, compared with public institutes (14%–34%; **Figure 12** and **Table S26**).

On average, across all the localised prostate cancer risk groups, only 27% (1,177/4,420) of men had surgery in a 'timely manner' in public hospitals, compared with 72% (9,055/12,607) who were treated in private institutes (**Table S26**). But these proportions differ markedly when examining the risk groups separately. Men with high-risk disease treated in private institutes consistently received surgery within 90 days at higher proportions (from 75–82%) compared with men who had intermediate- (62–70%) or low-risk disease (43–45%; see **Figure 12** and **Table S26**).

When considering the countries separately, similar overall patterns for timeliness of surgery in localised disease were seen in Australia and NZ (**Figure 12**, **Table S27**, **Table S28**). Among men with high-risk disease, for whom surgery might be considered more urgent, in Australia, 82% (2,848/3,484) of those treated in private institutes received surgery within 90 days, versus 34% (311/911) for public institutes. In NZ, 75% (210/280) of men who had surgery for high-risk disease and were treated privately received surgery within 90 days, versus 34% (154/457) of men who were treated publicly.

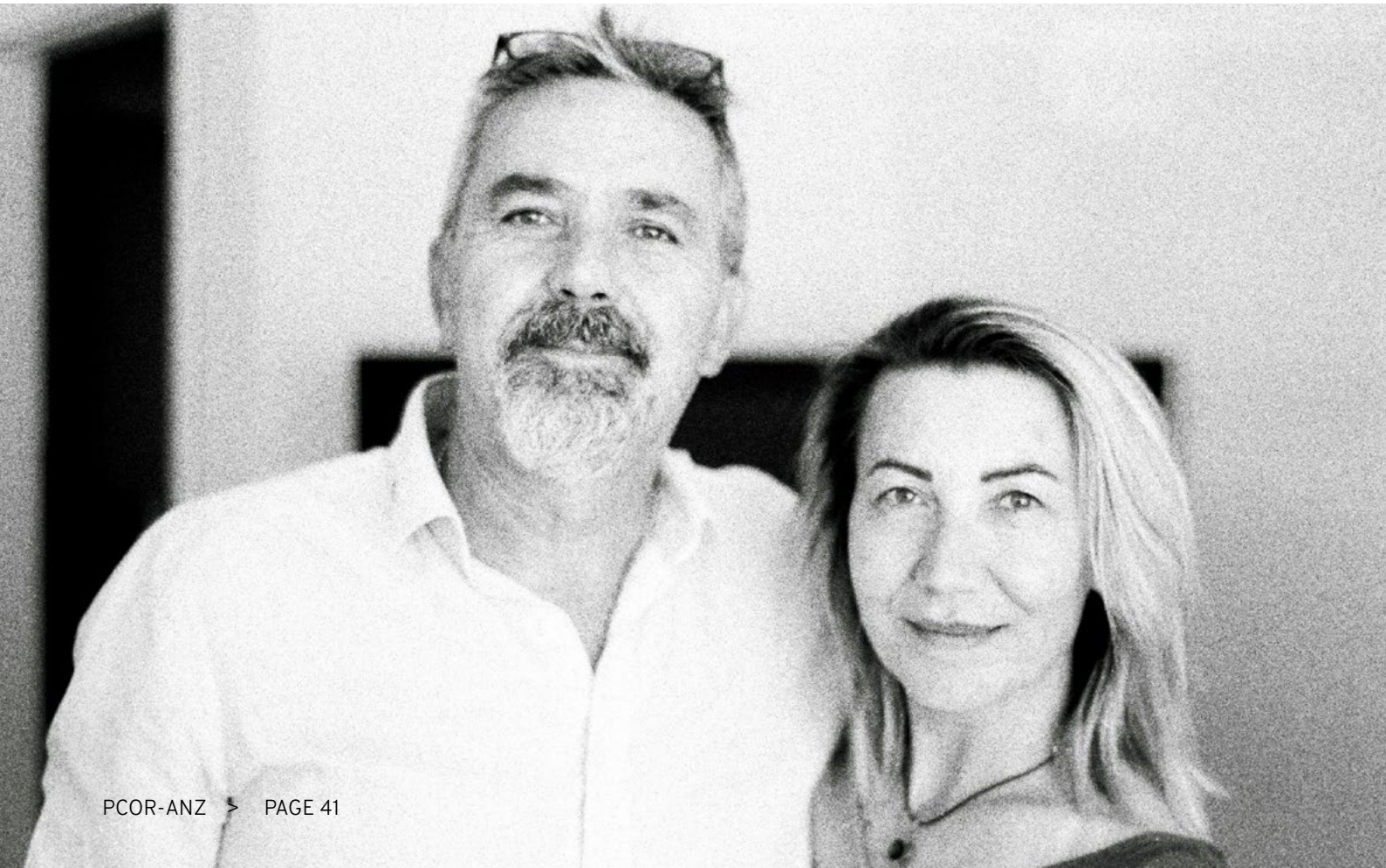
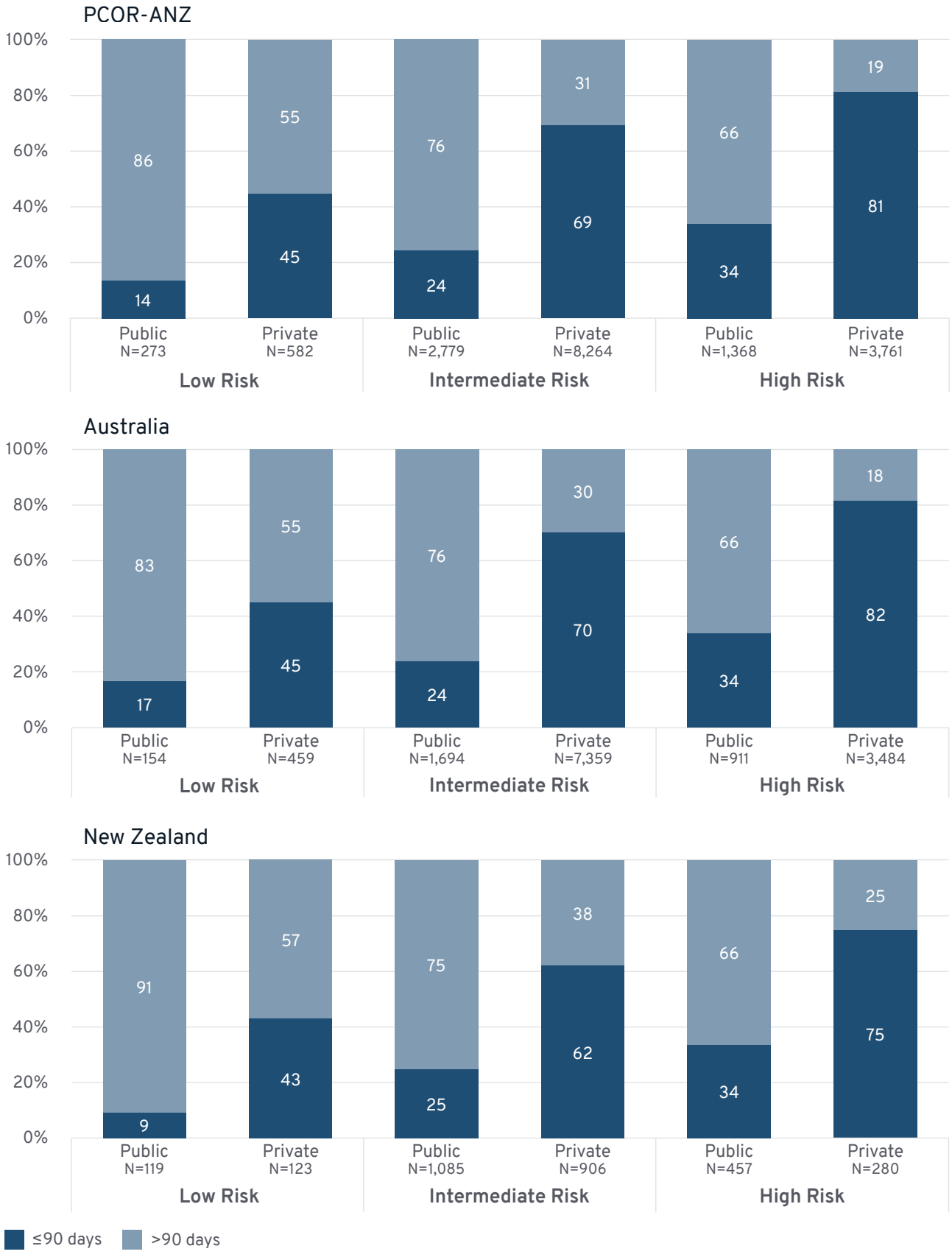


FIGURE 12: **PROPORTION OF REGISTRANTS RECEIVING SURGERY WITHIN 90 DAYS OF DIAGNOSIS, BY NCCN GROUP AND SURGICAL INSTITUTE TYPE ACROSS PCOR-ANZ (2020–2022)**



- Proportions per institute type are calculated as a percentage of PCOR-ANZ registrants from that NCCN risk group who had available management data (from all jurisdictions combined, Australia only, or NZ only).
- PCOR-ANZ registrants who had an NCCN risk group, received surgery as initial therapy, and for whom timeliness could be calculated were dichotomised into groups receiving surgery ≤90 days and >90 days post diagnosis.
- Of the men with appropriate data available (per Figure 10), 98.9% (17,027/17,212) were able to be assigned to a public or private surgical institute. These were then separated into PCOR-ANZ, PCOR-Australia and PCOR-NZ.
- For the full data tables, refer to Table S26 (PCOR-ANZ), Table S27 (Australia) and Table S28 (NZ); percentages are rounded and may not add up to 100%.

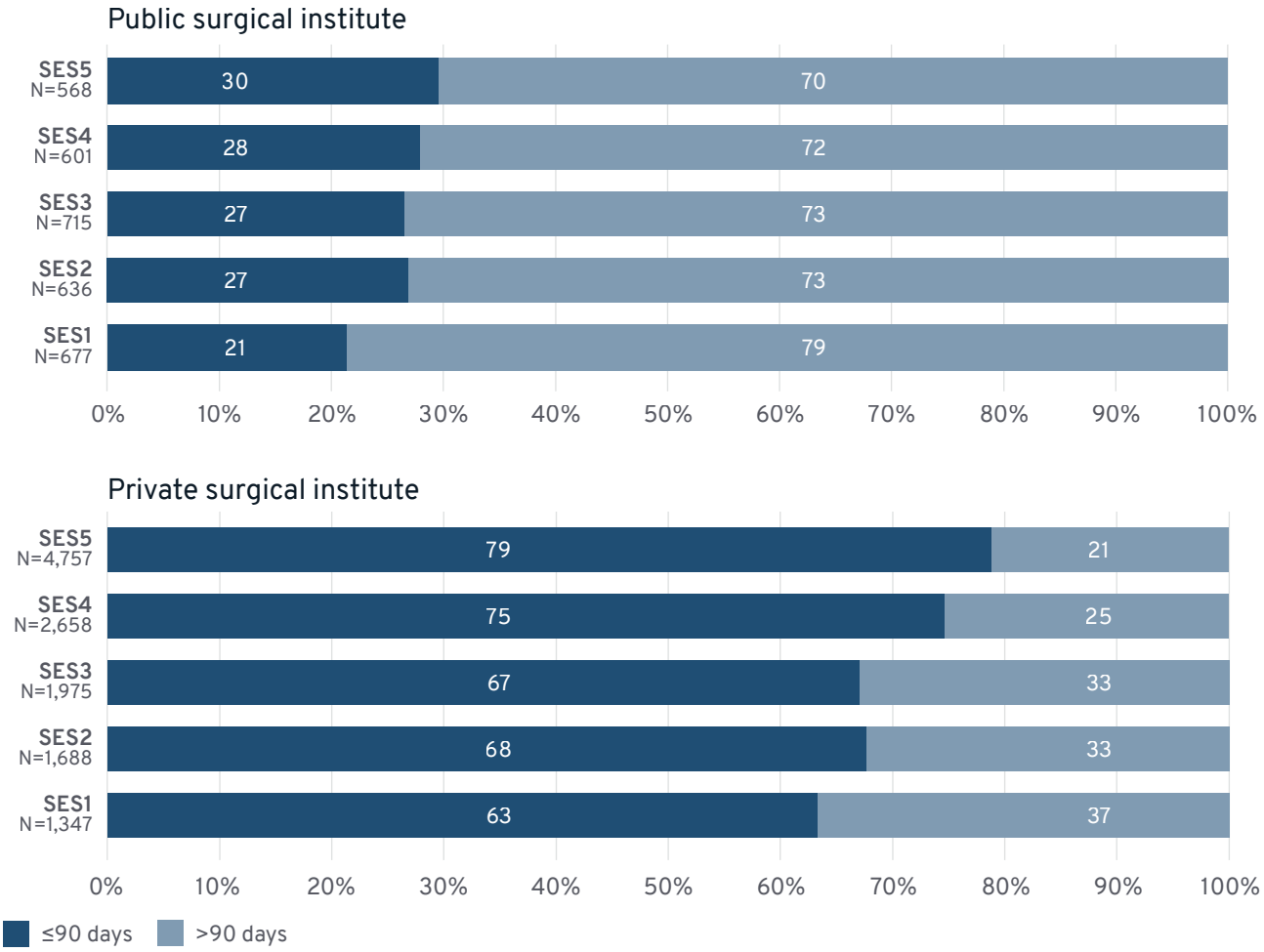
Timeliness of surgery by SES and treating institute

There were 15,784/46,505 Australians with data available on SES (postcode), type of treating institute, and receipt of surgery for their prostate cancer (34% of all Australian registrants).

Higher proportions of men from more-advantaged SES groups received surgery within 90 days of diagnosis compared with those from less-advantaged SES groups, regardless of whether treatment was public or private (**Figure 13**).

Institution type had the greatest impact on receiving surgery within 90 days of diagnosis. In men who were treated in private institutes (**Figure 13**), 79% (3,752/4,757) from the most advantaged SES group received surgery within 90 days; and 63% (853/1,347) from the least advantaged SES group received surgery within 90 days. In men who were treated in public institutes (**Figure 13**) 30% (168/568) from the most advantaged SES group and 21% (145/677) from the least advantaged SES group received surgery within 90 days.

FIGURE 13: **PROPORTION OF REGISTRANTS RECEIVING SURGERY WITHIN 90 DAYS OF DIAGNOSIS BY SES GROUP AND INSTITUTE TYPE (AUSTRALIA ONLY; 2020–2022)**



- Proportions per SES group are calculated as a percentage of Australian residents who had surgery, and had data available on their postcode and the date of their surgery. From this, the time between diagnosis and surgery was dichotomised to ≤90 days and >90 days.
- Information on date of surgery was available for ~100% (19,160/19,167) men who had surgery across PCOR-ANZ as a whole; 15,622 of whom were Australian residents with data available on both their postcode and institute type (99% of Australian residents with a known surgical date and postcode [15,622/15,784]).
- For the full data table, refer to Table S29; percentages are rounded and may not add up to 100%.

TIMELINESS OF RADIATION THERAPY

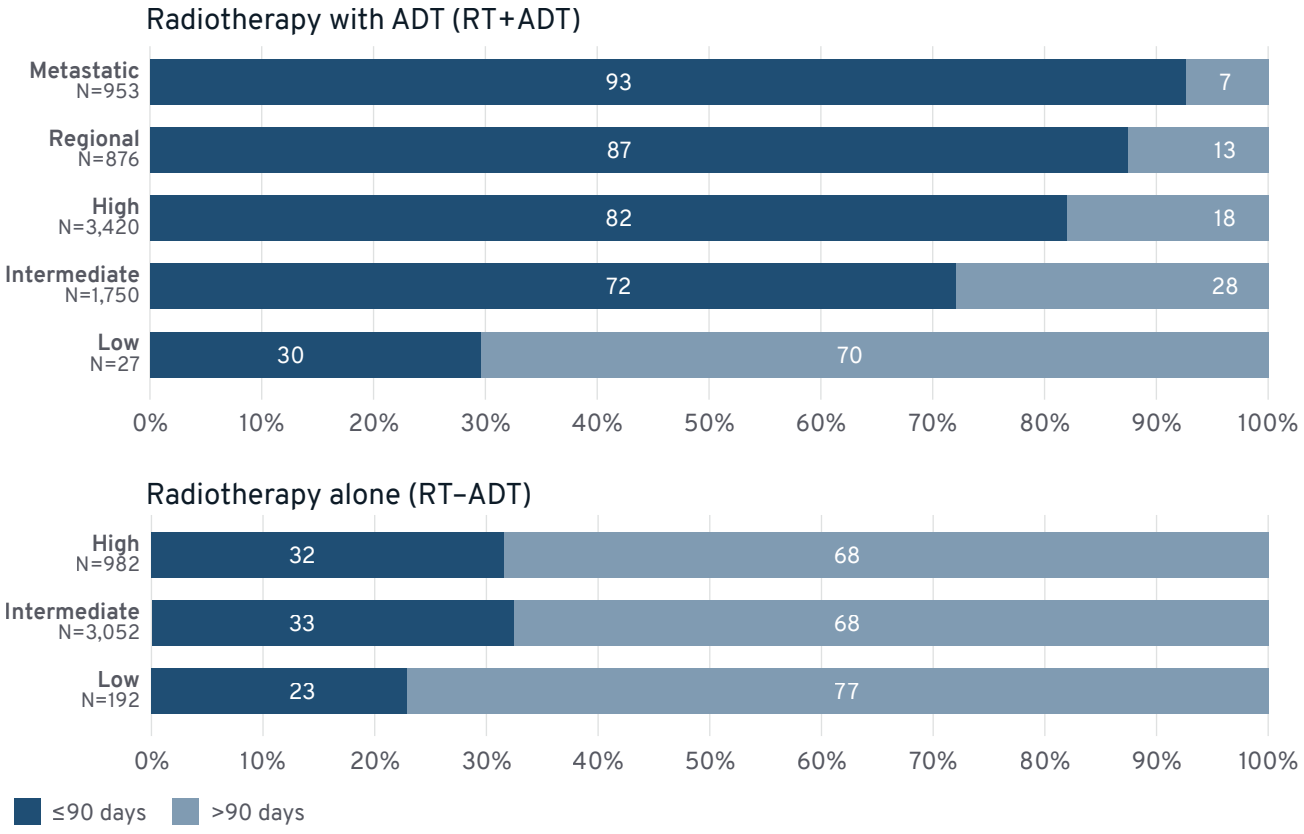
There were 12,681/56,677 men who had data available on RT (with or without ADT) for their prostate cancer (22% of all registrants).

Timeliness of radiation therapy by NCCN group

There were 11,677/12,681 men who had data available on receipt of RT +/–ADT and NCCN risk group for their prostate cancer (92% of all registrants receiving RT +/–ADT). In men with low-risk disease the lowest proportions (23%–30%) of receiving any RT within 90 days of diagnosis compared with the other NCCN risk groups (**Figure 14**). This is consistent with Clinical Practice Guidelines that recommend men with low-risk disease should be managed with AS or WW.[11,12] In intermediate-risk disease, only 33% (992/3,052) of men who received RT alone were treated within 90 days of diagnosis, whereas 72% (1,262/1,750) of men who received RT+ADT received it within 90 days. In men with high-risk disease, rates of treatment within 90 days were 32% (310/982) for RT alone and 82% (2,805/3,420) for RT+ADT. The highest proportions of men receiving RT+ADT within 90 days of diagnosis were men with metastatic (93%; 883/953) or regional disease (87%; 776/876).

This means that most men who receive RT alone (68–77% across low-to-high risk groups) are being treated outside of the advised timeframe. For men receiving RT+ADT this proportion is far smaller (7% [70/953] in metastatic disease to 28% [488/1,750] in intermediate-risk disease); except for men with low-risk disease in whom 70% receive RT+ADT more than 90 days after diagnosis.

FIGURE 14: **PROPORTION OF REGISTRANTS RECEIVING RADIOTHERAPY (ALONE OR WITH ADT) WITHIN 90 DAYS OF DIAGNOSIS, BY NCCN GROUP (2020–2022)**



- Proportions per NCCN risk group are calculated as a percentage of PCOR-ANZ registrants from that NCCN risk group who had RT with or without ADT. For patients receiving RT alone, the time between diagnosis and RT was dichotomised to ≤90 days and >90 days. For patients receiving RT+ADT, the time between diagnosis and RT or ADT commencement (whichever occurred first) was dichotomised to ≤90 days and >90 days.
- 7,026/7,420 (94.7%) of registrants who received RT+ADT, had an NCCN risk group and relevant treatment dates available; and 4,226/5,261 (80.3%) of registrants who received RT alone, also had an NCCN risk group of low to high, and relevant treatment dates available.
- For the full data tables, refer to Table S30 (RT–ADT) and Table S31 (RT+ADT); percentages are rounded and may not add up to 100%.

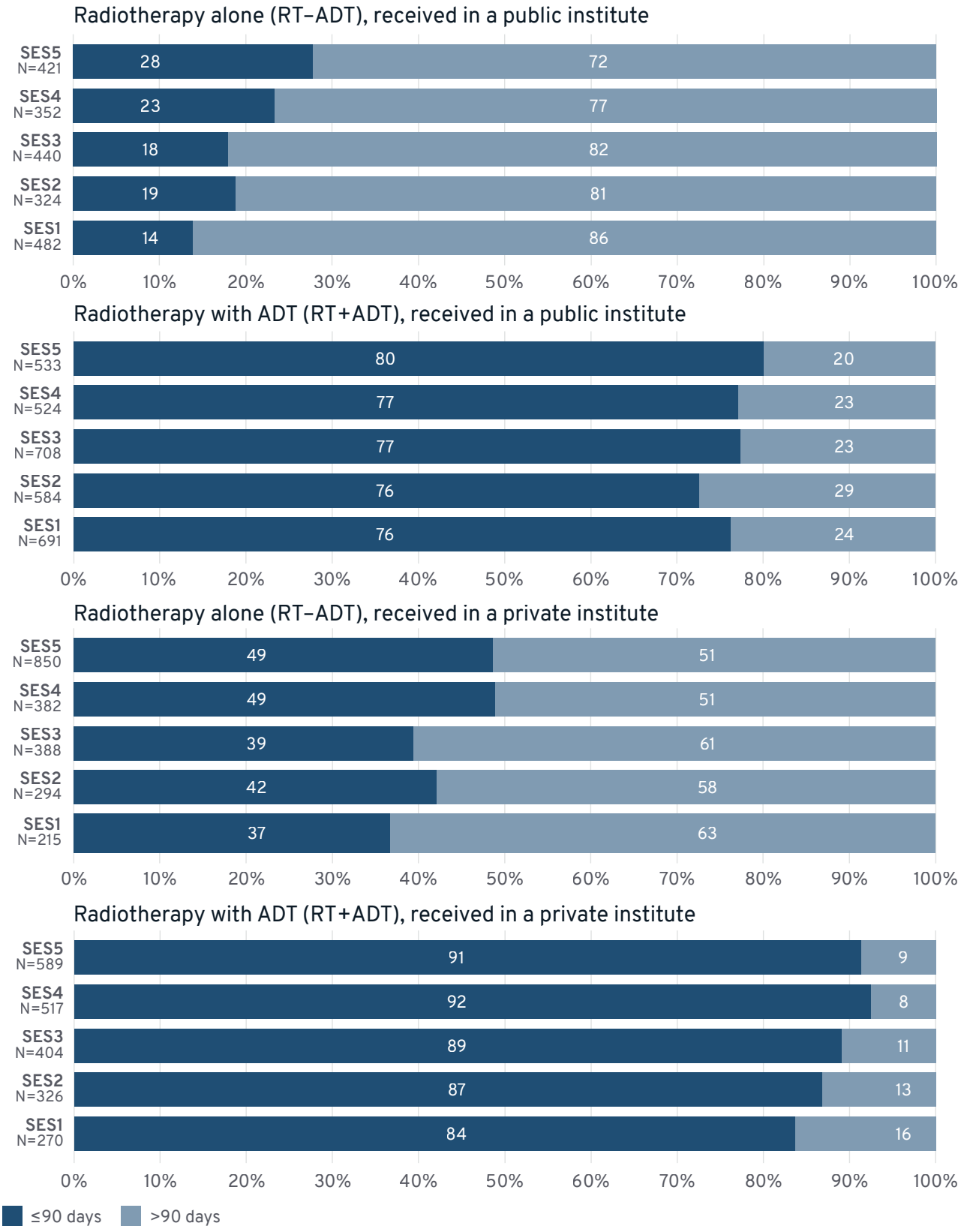
Timeliness of radiation therapy analysed by SES and treating institute type

There were 9,788/46,505 men with data available on postcode (to derive SES), receipt of radiation therapy, and treating institute for their prostate cancer (21% of Australian registrants). When analysing receipt of RT by SES and treating institute (**Figure 15 and Table S32**), the overall trend was consistent with the patterns observed in the surgery analysis. That is, men were more likely to have timely treatment if they were managed in private institutes and if they had a higher SES (**Figure 15**).

In men from the least advantaged SES group (SES1) 76% (527/691) received RT+ADT within 90 days, compared with 14% (67/482) of men who received RT alone; and 80% (427/533) of men from the most advantaged SES group (SES5) received RT+ADT within 90 days compared with 28% (117/421) of men who received RT alone.

The group who received RT+ADT in a private institute contained the highest proportion (90%; 1,885/2,106) of men receiving treatment within 90 days of diagnosis. Among those who were treated in private institutes (**Figure 23 and Figure 24**), 91% (538/589) of men from the most advantaged SES group (SES5) received RT+ADT within 90 days compared with 49% (414/850) of men who received RT alone. Further, 84% (226/270) of men from the least advantaged SES group (SES1) received RT+ADT within 90 days in a private institute compared with 37% (79/215) of men who received RT alone.

FIGURE 15: **PROPORTIONS OF REGISTRANTS RECEIVING RADIOTHERAPY (ALONE OR WITH ADT) WITHIN 90 DAYS OF DIAGNOSIS, BY SES GROUP AND INSTITUTE TYPE (AUSTRALIA ONLY; 2020–2022)**



- Proportions per SES group are calculated as a percentage of Australian residents who had management and postcode data available (Australia only).
- Of the 5,576 Australian registrants who received RT+ADT, 5,558/5,576 (99.7%) had SES data available, and of these, 5,405/5,558 (97.2%) had a treatment start date (RT or ADT, whichever occurred first); and 5,146/5,405 (95.2%) had data available on institute type.
- Of the 4,442 Australian registrants who received RT without ADT, 4,427/4,442 (99.7%) had SES data available, and of these 4,383/4,427 (99%) had treatment start data available; and 4,148/4,383 (94.6%) had data available on institute type.
- For the full data tables, refer to Table S32 (RT–ADT) and Table S33 (RT+ADT); percentages are rounded and may not add up to 100%.

SURGERY

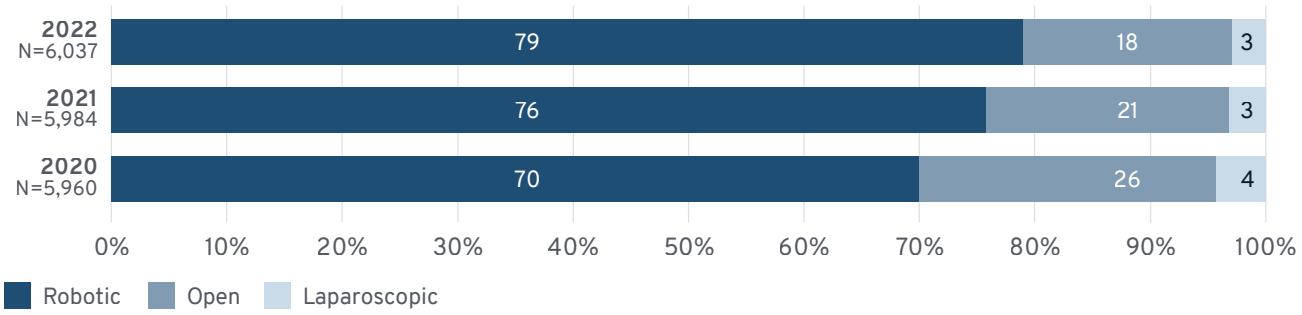
Surgical approach

There were 19,167/56,677 men with data available on receipt of surgery of their prostate cancer (34% of all registrants). Robotic surgery continues to increase in prevalence, from 70% (4,169/5,960) in 2020 to 79% (4,772/6,037) in 2022. There is a concomitant decrease in the proportion of both open (26% [1,536/5,960] in 2020 to 18% [1,089/6,037] in 2022) and laparoscopic prostatectomy (4% [255/5,960] in 2020 to 3% [176/6,037] in 2022; **Figure 16 and Table S34**).

The majority of robotic surgeries are performed in private institutes (87%; 11,720/13,475). Comparatively, 69% (2,683/3,884) of open surgeries are performed in public institutes (**Figure 17** and **Table S35**).

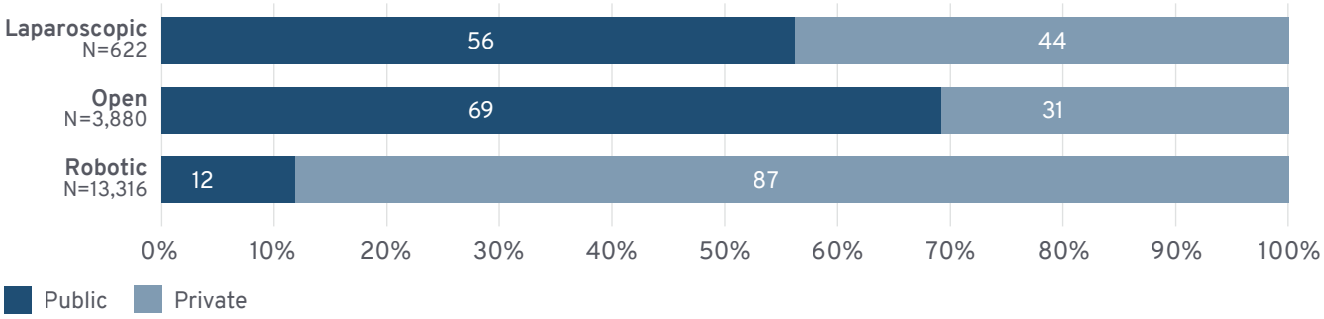
When analysing the surgical approach by SES (Australia only; **Figure 18 and Table S36**), 91% (4,541/4,995) of men from most advantaged SES group (SES5) received robotic surgery compared with 73% (1,389/1,893) for men from the least advantaged SES group (SES1).

FIGURE 16: **PROPORTION OF REGISTRANTS RECEIVING SURGERY, BY SURGICAL APPROACH AND DIAGNOSIS YEAR (2020–2022)**



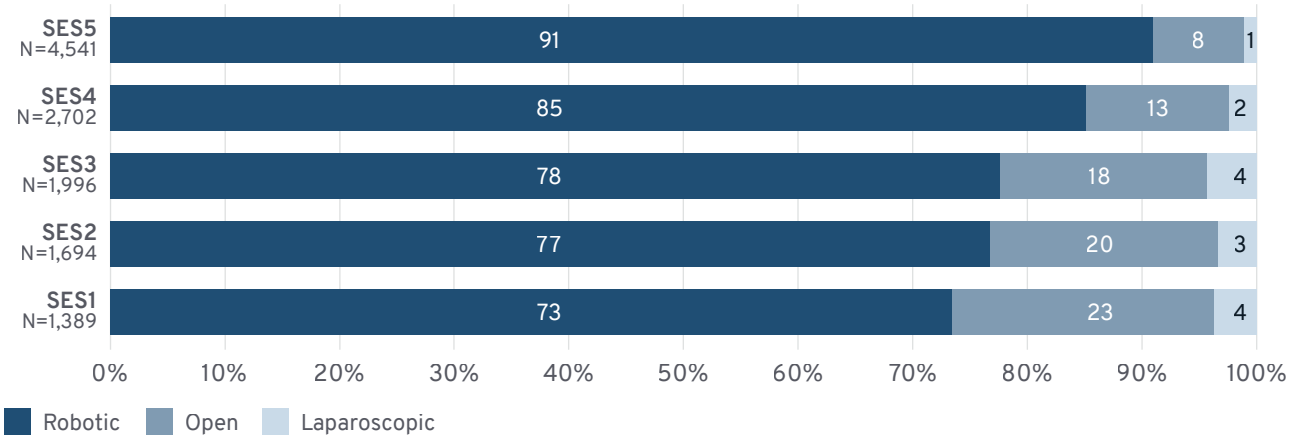
- Proportions per year are calculated as a percentage of PCOR-ANZ registrants who had data available on surgical approach per year.
- Information on surgical approach (laparoscopic, open, or robotic only) was available for 97.6% (17,981/18,429) of PCOR-ANZ registrants who had available data on surgery.
- For the full data table, refer to Table S34; percentages are rounded and may not add up to 100%.

FIGURE 17: **PROPORTION OF REGISTRANTS RECEIVING SURGERY, BY SURGICAL APPROACH AND TREATING INSTITUTE (2020–2022)**



- Proportions per surgical approach are calculated as a percentage of PCOR-ANZ registrants who had data available on surgical approach and treating institute.
- Information on surgical approach (laparoscopic, open, or robotic only) was available for 97.6% (17,981/18,429) of PCOR-ANZ registrants who had available data on surgery and treating institute.
- For the full data table, refer to Table S35; percentages are rounded and may not add up to 100%.

FIGURE 18: **PROPORTION OF REGISTRANTS RECEIVING SURGERY, BY SURGICAL APPROACH AND SES GROUP (AUSTRALIA ONLY; 2020–2022)**



- Proportions per SES group are calculated as a percentage of PCOR-Australia registrants who had data available on postcode and surgical approach.
- Information on surgical approach (laparoscopic, open, or robotic only) and SES group was available for 92.6% (14,839/16,021) of PCOR-Australia registrants who had surgery.
- For the full data table, refer to Table S36; percentages are rounded and may not add up to 100%.

Crossing between public and private institutes for surgical treatment

Thirty-two percent of men (17,932/56,677) had surgical data that included information on diagnosing and treating institute (**Figure 19**). This allows us to visualise the proportions of men who moved between public and private institutes during their treatment.

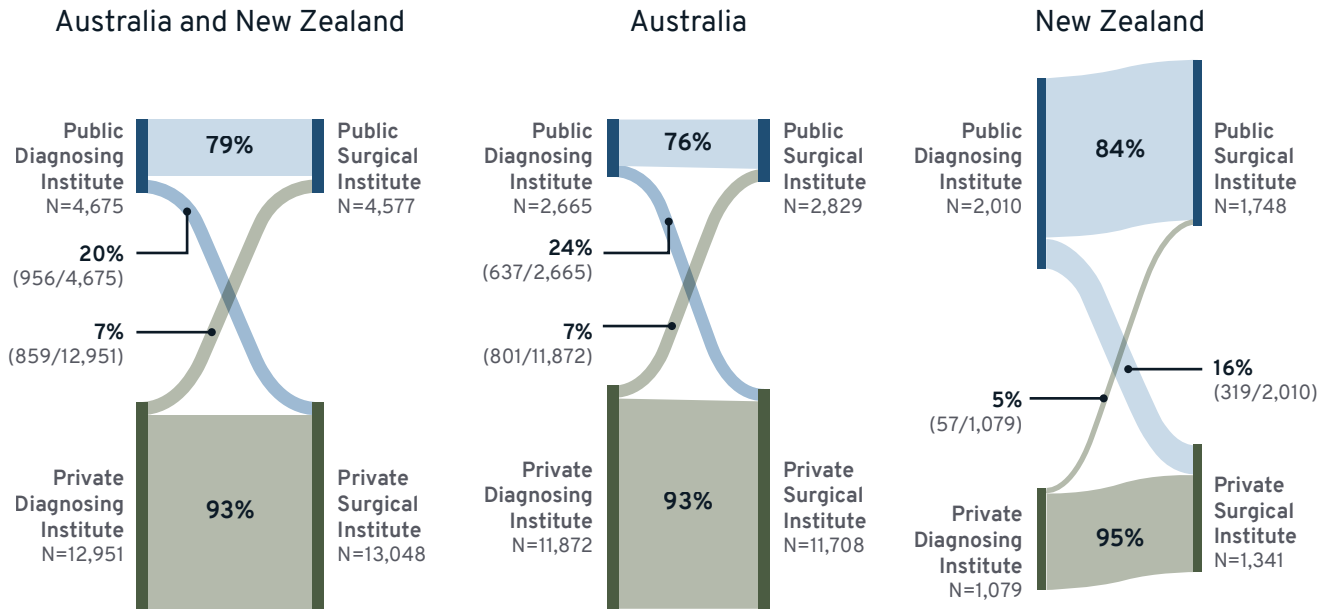
Across 2020–2022 in the full PCOR-ANZ data set (**Figure 19** and **Table S37**) 79% (3,719/4,675) of men who were diagnosed in a public institute were treated in a public institute, and 20% (956/4,675) of men switched to a private treating institute. However, 93% (12,093/12,951) of men who were diagnosed in a private institute continued to be treated in a private institute, with only 7% (858/12,951) of men switching to a public treating institute. Overall though, the flow of patients between the two settings nets out and nearly the same number of men move from diagnosis in private to public and vice versa (n=858 private to public vs n=956 public to private).

In Australia, the volume of diagnosis and management for prostate cancer is predominantly undertaken in the private system. (**Figure 19** and **Table S38**). A notable proportion of men diagnosed publicly (24%) had treatment in the private setting, whereas only 6.7% of those diagnosed in private switched to a public treating institute. Because the numbers treated in private overall were much larger, even a relatively small proportion of them moving to public made up about the same absolute number as those moving in the other direction.

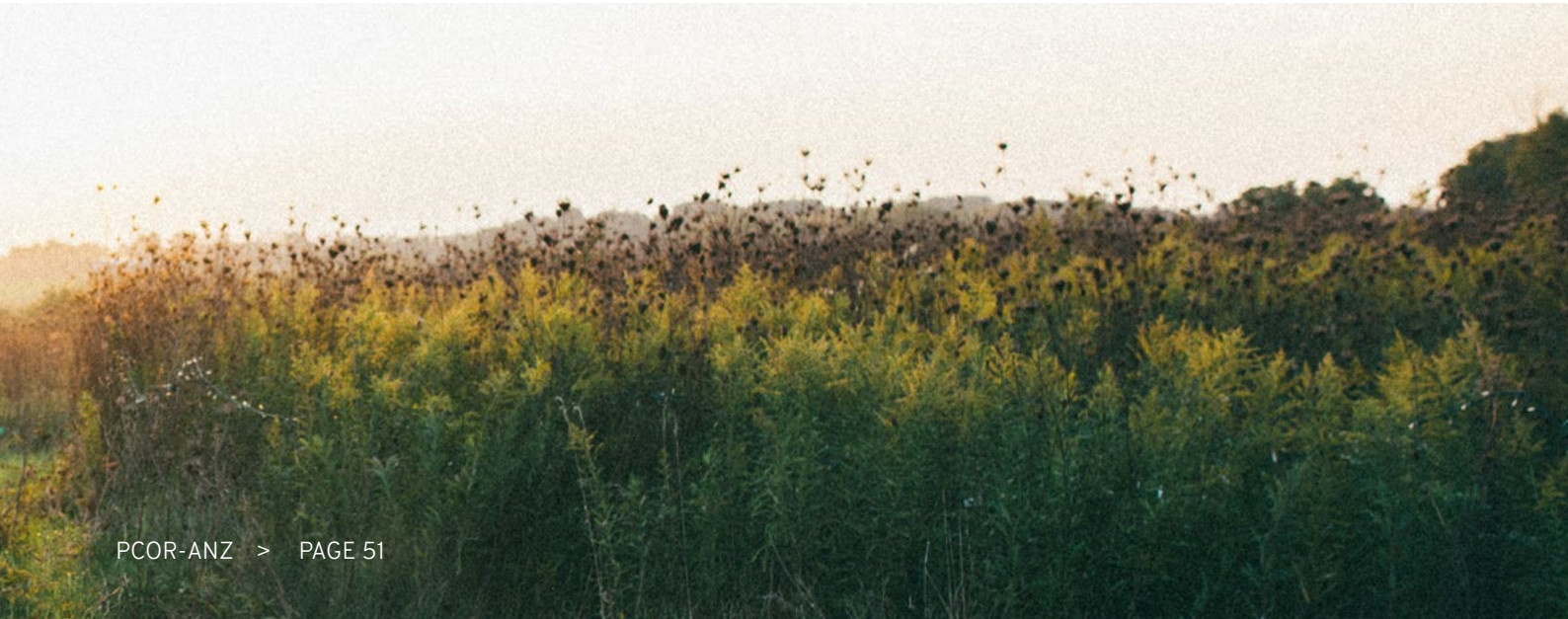
The situation in NZ is different with a dominance of the public system for diagnosis and treatment (**Figure 19** and **Table S39**). A higher proportion of men (84%) who were diagnosed in a public institute were also treated in a public institute compared with Australia; with a smaller proportion (16%) of men switching to a private institute for treatment. Whereas 95% of men who were diagnosed in a private institute continued treatment in a private institute and 5.2% of men switched to a public surgical institute.

In summary, in Australia, the rate of crossover between public and private treatment institutes is comparatively low, but very much favours public diagnosis and private treatment. In NZ, the picture is more complicated, but many men do switch from public diagnosis to private treatment. Overall, surgery is completed more frequently in the public system in NZ.

FIGURE 19: **PROPORTION OF REGISTRANTS RECEIVING SURGERY BY DIAGNOSING AND TREATING INSTITUTE ACROSS PCOR-ANZ (2020–2022)**



- Demonstrates the flow between diagnosing and surgical institutes in PCOR-ANZ, PCOR-Australia, and PCOR-NZ:
  - 17,786/19,167 (93%) of PCOR-ANZ registrants who had surgery as initial treatment were able to be classified into public/private diagnosing/treating institutions.
  - 14,697/16,021 of Australian registrants who had surgery as initial treatment were able to be classified into public/private diagnosing/treating institutions.
  - 3,089/3,146 of NZ registrants who had surgery as initial treatment were able to be classified into public/private diagnosing/treating institutions.
- For the full data tables, refer to Table S37 (PCOR-ANZ), Table S38 (Australia) and Table S39 (NZ).



Surgical margin

Positive surgical margins after surgery for prostate cancer are a risk factor for biochemical failure and cancer recurrence. Positive surgical margins are determined by a pathologist after surgery; and there is considerable debate as to whether surgical type (Open, Robotic or Laparoscopic prostatectomy) has an effect on margin positivity.[38] A positive margin in organ-confined disease (pT2) has been described as a surrogate marker of surgical skill.[39] Having a low rate of margin positivity remains an important clinical quality metric.[40]

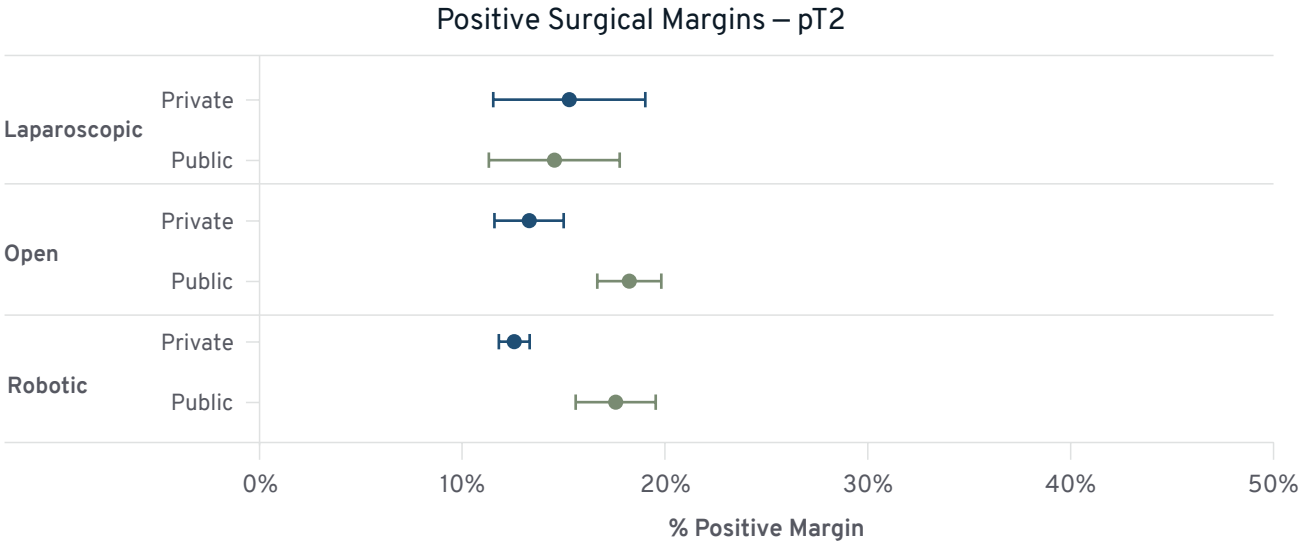
Surgical approach and positive surgical margin

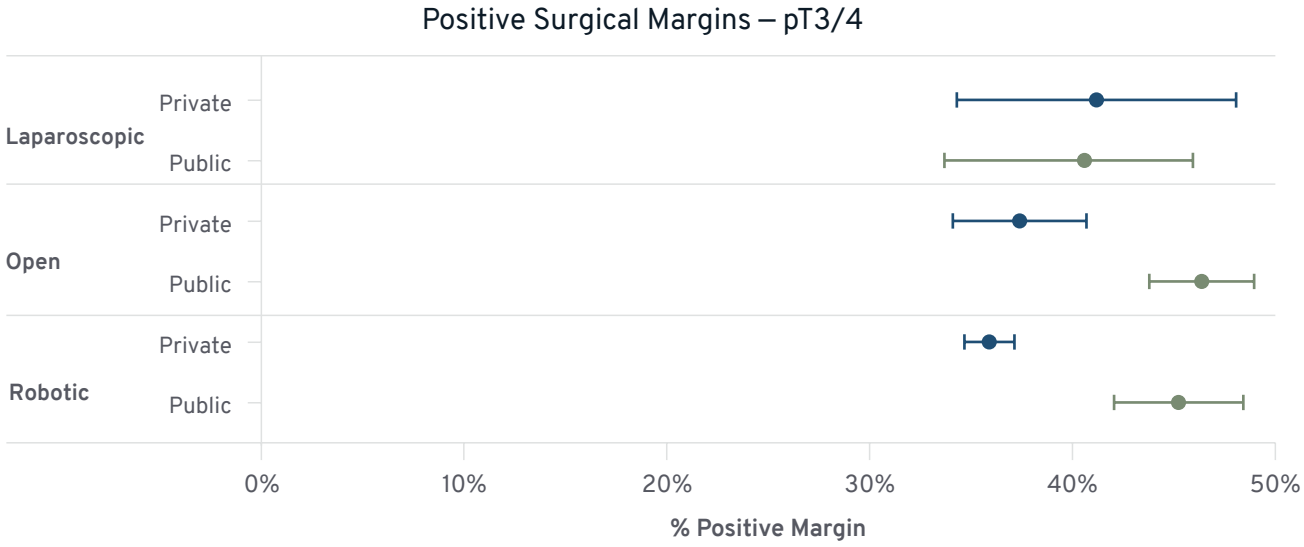
There were 17,722 men included in the regression analysis of surgical margins (**Table S40**).

Substantial differences were found between the proportions of positive surgical margins seen in pT2 and pT3/4 disease (**Figure 20 and Table S40**): in men with pT2 disease the risk-adjusted margin positivity rate was 14.6% (95% CI, 13.83–15.32%), whereas in those with pT3/4 disease, overall, the risk-adjusted margin positivity rate was 37.4% (95% CI, 36.33–38.45%).

Within each pathologic T category, there were no significant overall differences between surgical approaches in the proportions of positive surgical margins. However, there were differences seen for public versus private surgical institutes (**Figure 20 and Table S40**). Private institutions had substantially lower rates of positive surgical margins for both robotic and open approaches (**Figure 20 and Table S40**), which agrees with previously published data.[41,42] The results for laparoscopic surgery had wider margins of error because the numbers are much lower (3.5% of all surgeries), but generally the rates of positive margins were similar in public and private (**Figure 20 and Table S40**).

FIGURE 20: **RISK-ADJUSTED MODEL OF REGISTRANTS WHO HAD POSITIVE SURGICAL MARGINS, BY SURGICAL APPROACH AND TREATING INSTITUTE TYPE (2020–2022)**





- Positive surgical margins for pT2 disease. Stratified by surgical approach (laparoscopic, open, or robotic) and institute type (private or public).
- Dots represent the predicted percentage, and the lines represent the 95% confidence interval.
- The multivariate logistic regression model was adjusted for surgical approach (robotic, open, laparoscopic), surgical institute type (public, private), jurisdiction, PSA level at the time of surgery was stratified into 0 to ≤5, >5 to ≤10, >10 to ≤20, >20 to ≤50, and >50 ng/mL.
- Pathologic T stage was dichotomised as pT2 and pT3/4 and were analysed separately.
- For the full data table refer to Table S40.

RADIATION THERAPY

Twenty-two percent of men (12,681/56,677) had data on radiation therapy of their prostate cancer. Evidence-based guidelines support both radiation therapy and surgery as treatments indicated for localised prostate cancer with distinct risks and benefits.[9,29,30] Radiation is generally considered much more appropriate for older patients and gives men a better chance of being continent and maintaining erectile capacity.

Hypofractionation

In the late 2010s a series of large international clinical trials established that curative radiation treatments for prostate cancer could be much shorter and still be as safe and as effective as the 'traditional' or conventional courses that used to take seven or eight weeks to deliver. This is termed hypofractionation'.[43,44] There were 10,571/12,681 men with data available on receipt of conventional or hypofractionated RT for their prostate cancer (83% of all registrants who received RT). Across 2020–2022, the proportion of men receiving hypofractionation has increased from 70% (2,259/3,205) in 2020 to 82% (3,161/3,833) in 2022 (**Table 11**).

Radiation therapy, curative intent

Ninety-two percent (11,677/12,681) of all registrants who received RT had data available on radiation therapy (with or without ADT) and NCCN risk group for their prostate cancer. Randomised trials since the late 1990s demonstrated that to significantly improve prostate cancer outcomes, the external beam radiotherapy (EBRT) radiation dose had to be greater than a certain threshold (74 Gy in 2 Gy fractions) and that doses much higher than these did not provide much extra benefit.[45] PCOR-ANZ therefore uses the administration of at least a radiation dose that is equivalent to, or more than, 74 Gy in 2 Gy fractions as a quality indicator.[46]

In the PCOR-ANZ dataset, across 2020–2022 (**Table 12**) 91% (9,759/10,686) of men who received EBRT with curative intent received an EQD2 of at least 74 Gy. Men with low-risk disease had the highest proportion (97%; 131/135) of men receiving at least 74 Gy EQD2 compared with other groups, and those with regional disease had slightly lower proportions compared with other groups (87%; 797/913). This is understandable: as risk group increases, higher proportions of men have treatment that is aimed at preserving quality of life and avoiding side-effects rather than aiming to be curative. This and other treatment- or patient-specific factors may lead to EBRT treatment plans that differ from the 'curative intent' dosage guidelines (**Table 13**).[47]

TABLE 11: **PROPORTION OF MEN RECEIVING HYPOFRACTIONATED RT OVER TIME (2020–2022)**

	Conventional	Hypofractionation
2020 N=3,205	946/3,205 30%	2,259/3,205 70%
2021 N=3,533	867/3,533 25%	2,666/3,533 75%
2022 N=3,833	672/3,833 18%	3,161/3,833 82%
TOTAL N=10,571	2,485/10,571 24%	8,086/10,571 76%

Note: Only patients who had a known radiation dose and number of fractions were included in this Table, as both are needed to determine if a course of treatment was hypofractionated.

TABLE 12: **PROPORTION OF REGISTRANTS RECEIVING EBRT WITH CURATIVE DOSE (RECEIVED MINIMUM EQD2 OF 74 GY) OVER TIME (2020–2022)**

	≥ EQD2 of 74 Gy	<EQD2 of 74 Gy
2020 N=3,255	2,954/3,255 91%	301/3,255 9.3%
2021 N=3,572	3,238/3,572 91%	334/3,572 9.4%
2022 N=3,859	3,567/3,859 92%	292/3,859 7.6%
Total N=10,686	9,579/10,686 91%	927/10,686 8.7%

Note: This table includes men with low-, intermediate-, high-risk disease, and regional disease.

TABLE 13: **PROPORTION OF REGISTRANTS RECEIVING EBRT WITH CURATIVE DOSE (RECEIVED MINIMUM EQD2 OF 74 GY) BY NCCN**

	≥ EQD2 of 74 Gy	< EQD2 of 74 Gy
Low-risk N=135	131/135 97%	4/135 2.9%
Intermediate Risk N =4,129	3,923/4,129 95%	206/4,129 4.9%
High Risk N=4,175	3,817/4,175 91%	358/4,175 8.6%
Regional Disease N=913	797/913 87%	116/913 12.7%
Total N=9,352	6,668/9,352 93%	1,684/9,352 7.3%

Note: This table doesn't include registrants with metastatic disease. For the full data table refer to Table S43.

CHAPTER 4

PATIENT-REPORTED OUTCOME MEASURES

PCOR-ANZ received 25,875 12-month post-treatment or post-management-decision PROMs responses, representing the views of 46% of men registered in our database over 2020–2022 (25,875/56,677; **Table 17**; **Figure 21** and **Table S44**). Over the 3-year reporting period (**Table S44**), the 12-month PROMs completion rate decreased from 48% (8,261/17,247) in 2020 to 44% (9,039/20,550) in 2022.

In 2022, the completion rate was highest in the ACT (69; 343/495) and TAS (67%; 507/761) and lowest in NSW (35%; 2,153/6,174) and SA (35%; 415/1,174). There was increase in 12-month PROMs completion rate in NT, from 26% (28/97) in 2020 to 39% (93/291) in 2022.

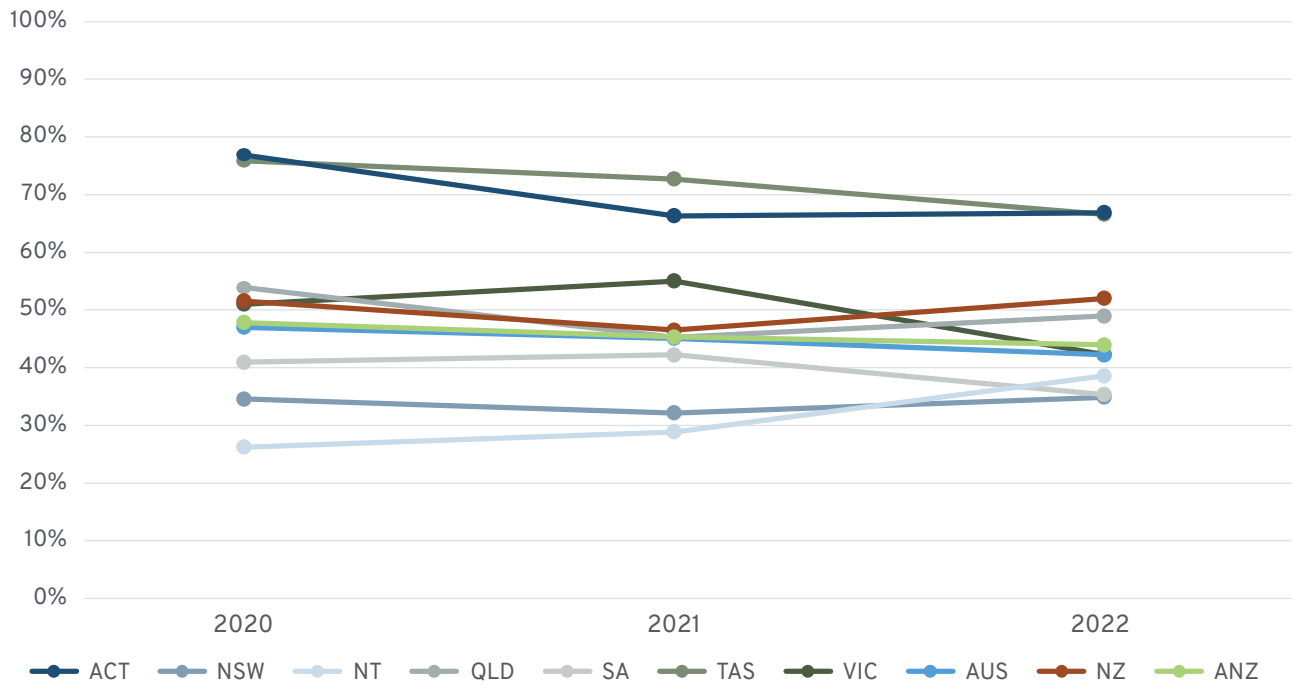
The 12-month PROMs completion rate was stable in NSW (35% [1,503/4,350] in 2020 to 35% [2,153/6,174] in 2022) and NZ (52% in 2020 and 52% in 2022); while other jurisdictions (VIC, ACT, QLD, SA and TAS) have experienced a decline.

Twelve-month PROMs have been collected in SA since 2008 and VIC started in 2009, with the other jurisdictions introducing PROMs when they joined PCOR-ANZ in 2015.

NZ has been collecting baseline PROMs since 2015, SA since 2007, and NT since 2016. Over the 3-year reporting period, baseline PROMs were completed by 36% (5,186/14,342) of men diagnosed with prostate cancer and registered in the database across SA, NT and NZ. TAS began collection in 2024 and is not included in this report (**Table S45**).

Over the 2020–2022 reporting period, 67% of registrants completed PROMs by mail (18,705/28,013), while 21% (5,834/28,013) completed electronically via an email link, and 19% (3,474/28,013) completed their PROMs over the phone (**Table S46**). Phone-based PROMs completion decreased from 21% (1,201/8,745) in 2020 and 22% (945/9,803) in 2021, to only 14% (945/9,803) in 2022. Correspondingly, PROMs completion by mail increased from 64% (5,602/8,745) in 2020 and 65% (6,184/9,465) in 2021, to 70% (6,919/9,803) in 2022 (**Table S46**).

FIGURE 21: **PCOR-ANZ PROMS COMPLETION RATES BY JURISDICTION OR COUNTRY (2020–2022)**



- Percentage of PROMs completion per year was calculated as the percentage of PCOR-ANZ registrants who answered at least one question when the PROMs were administered at 12 months following diagnosis/treatment.
- For the full data table, refer to Table S44.

PROMS ANALYSIS ACROSS DIFFERENT MANAGEMENT STRATEGIES

Low risk

Among men with low-risk disease who completed their PROMs questionnaires, overall 8.7% (317/3,653) reported moderate-to-big urinary bother (regardless of management strategy).

Considering individual treatments (**Figure 22; Table S47**) this proportion was 7.9% (39/493) in men who received surgery and 9% (252/2,856) in men who were managed with AS.

Use of one or more incontinence pads per day (**Figure 22**) was reported by 6.7% (247/3,686) of those with low-risk disease, regardless of management strategy. This rate was highest in men who received surgery at 27% (134/497). Among men managed with AS, 3.2% (92/2,886) reported use of one or more pads per day.

Leaking urine at least once per day (**Figure 22**) was reported by 17% (85/497) of men who received surgery, but only 6.6% (190/2,884) of men managed with AS.

Moderate-to-big bowel bother was reported by 2.8% (103/3,665) of men with low-risk disease regardless of management strategy, and 7.4% (9/121) of men who received RT–ADT. Whereas a moderate-to-big problem with loss of bowel control was reported by only 1.5% (56/3,638) of men with low-risk disease overall.

Moderate-to-big sexual bother (**Figure 22**) was reported by over 1 in 4 men overall (27%; 974/3,583) regardless of management strategy. But among individual management strategies, this was most prevalent – affecting around 1 in 2 men – among those who received RT+ADT (50%; 9/18) or surgery (47%; 232/492) and the least common rate amongst the active treatments was with RT–ADT (37.3%; 44/118).

Conversely, a fair-to-very-good ability to have an erection (**Figure 22**) was reported by 66% (1,852/2,802) of men who were managed with AS, compared with 33% (160/492) of those who received surgery, and 41% (49/120) of those managed with RT alone.

Use of sexual aids (**Table S47**) was reported by 31% (1,126/3,630) of men with low-risk disease overall, and was most common in men who received surgery 62% (306/495).

A moderate-to-big problem with feeling depressed (**Figure 22**) was reported by 7.7% (276/3,607) of men with low-risk disease overall (regardless of management strategy) and 11% (52/490) of men who received surgery. Notably, 7.2% (204/2,823) of men managed with AS also reported moderate-to-big problems with feeling depressed, while this was the response for only 6.7% (8/120) men who were receiving RT–ADT.

Intermediate risk

Among men with intermediate-risk disease who completed their PROMs questionnaires, moderate-to-big urinary bother (**Table S48**) was reported by 9.2% (978/10,668) of men regardless of management strategy. The rate was highest in men who received ADT +/–chemotherapy at 18% (19/104) but ranged between 8 and 10% in men using different management strategies; including 8% (101/1,281) in men managed with AS.

Use of one or more incontinence pads per day (**Figure 22**) was reported by 19% (2,060/10,751) of men with intermediate-risk disease overall; and was highest in men receiving surgery (29%; 1,783/6,257), 6% in men treated with RT+/–ADT (161/2,643) and lowest in those managed with AS (4.7%; 60/1,289).

Leaking urine once or more per day (**Figure 22**) was reported by 19% (1,171/6,260) of men who had intermediate-risk disease and received surgery; 18% (19/107) of men who were managed with ADT +/–chemotherapy; 8.7% (230/2,642) of men who received RT and 8.2% (106/1,290) of men managed by AS.

Moderate-to-big bowel bother (**Figure 22**) was reported by 3.9% (411/10,680) of men with intermediate-risk disease overall (regardless of management strategy). Among individual management strategies, the highest rates were reported by 13% (14/105) of men who received ADT +/– chemotherapy and 3.2% (41/1,280) of men who were managed with AS. Men treated surgically were least likely to have problems and those treated with RT+/–ADT had moderate rates (7.1% [185/2,604] overall).

Moderate-to-big problems with loss of bowel control (**Table S48**) affected 1.9% (199/10,568) of PROMs respondents with intermediate-risk disease overall (regardless of management strategy) but only 0.9% (55/6,198) of those who received surgery. However, the rate reached over 4% in those who received RT (RT–ADT, 68/1,558; RT+ADT, 41/1,000).

Moderate-to-big sexual bother (**Figure 22**) occurred in 2 in 5 men (40%, 4,184/10,423) with intermediate-risk disease overall (regardless of management strategy). The reported rate of sexual bother was highest in those who received surgery (46%, 2,808/6,153) and ranged between 34–40% among other management strategies.

Use of sexual aids was reported by almost 1 in 2 men with intermediate-risk disease overall (48%, 5,120/10,597; **Table S48**), and in 2 in 3 men (64%; 3,977/6,210) who received surgery. Whereas under a third (29%; 461/1,579) of men with intermediate-risk disease who received RT–ADT reported use of sexual aids.

However, a fair to very good ability to have an erection (**Figure 22**) was reported by almost two-thirds (59%; 727/1,242) of men managed with AS; two fifths of (39%; 604/1,556) men who received RT–ADT and a quarter (25%; 1,527/6,189) of those who received surgery.

Moderate-to-big problems with feeling depressed (**Figure 22**), overall, were noted by 8.7% (909/10,500) of men with intermediate-risk disease, with the highest rate in reported by men receiving ADT +/–chemotherapy (10.6%; 11/104).

High risk

Thirteen percent (789/6,043) of men with high-risk disease who completed their PROMs reported moderate-to-big urinary bother (**Figure 22; Table S49**). Considering individual management strategies, the rates were comparatively notable in high-risk men receiving WW (16%; 17/109) and those who received ADT +/– chemotherapy (15%, 56/372).

Use of one or more incontinence pads per day (**Figure 22**) was reported by almost 1 in 4 men with high-risk disease overall (24%; 1,426/6,077); and more than 1 in 3 men (37%; 1,081/2,940) who underwent surgery. Although the rates among other management categories remained between 9% (36/422 RT–ADT) and 14% (52/378, ADT +/– chemotherapy) in men with high-risk disease.

Similarly, urine leakage (**Figure 22**) was reported by a quarter of men (26%; 757/2,943) with high-risk disease who received surgery, but fewer than 16% of men across all other management strategies.

Moderate-to-big bowel bother (**Table S49**), overall, was reported by 6.8% (409/6,031) of men with high-risk disease, and was most notable in those receiving RT occurring at a rate of approximately 10% (42/422, RT–ADT; 188/1,867, RT+ADT). Overall, 3.2% (189/5,893) of men with high-risk disease reported moderate-to-big problems with loss of bowel control, regardless of management strategy.

Moderate-to-big sexual bother (**Figure 22**) occurred in 2 in 5 men (41%; 2,357/5,769) with high-risk disease overall; with the highest rates occurring in those who received surgery (46%; 1,316/2,873) and those who received RT (38% [150/393] RT–ADT; 38% [668/1,774] RT+ADT).

One third (31%; 1,869/5,951) of men with high-risk disease reported the use of sexual aids, regardless of management strategy (**Table S49**); which was most often reported – by over half of men (52%; 1,509/2,913) – among those receiving surgery. Only 12–14% of men receiving radiation therapy reported use of sexual aids (56/399, RT–ADT; 215/1,851, RT+ADT).

A fair-to-very-good ability to have an erection (**Figure 22**) was reported by 23% (25/107) of men with high-risk disease managed with WW and 43% (43/100) of those managed with AS. Lower rates were reported in those who received RT−ADT (20%; 81/400), RT+ADT (7.3%; 133/1,814) and surgery 13% (375/2,897).

Overall, 11.5% (679/5,887) of men with high-risk disease reported moderate-to-big problems with feeling depressed (regardless of management strategy; **Figure 22**); and this was most prevalent in men who received RT+ADT (13.4%; 243/1,814) and those who received ADT +/− chemotherapy (13.4%; 41/358).

Regional disease

Among men with regional disease who completed their PROMs questionnaires, moderate-to-big urinary bother was reported by 13% of men overall (111/833) and use of at least one incontinence pad per day was reported by 17% (138/838; **Table S50**). Considering individual management strategies, men who had surgery were most affected by urinary problems, with 30% (45/150) reporting leaking urine once or more per day (**Figure 22**).

Moderate-to-big bowel bother was reported by 9.2% (76/829) of men with regional disease; and 5.1% (41/806) of men with regional disease reported moderate-to-big problems with loss of bowel control (regardless of management strategy; **Figure 22**; **Table S50**).

Across the sexual domain of the PROMs questionnaire (**Figure 22**), overall, 2 in 5 men (42%; 327/786) with regional disease reported moderate-to-big sexual bother (regardless of management strategy; **Table S50**). This outcome was also most prominent in men who had surgery, being reported by 56% (80/144) of respondents who underwent a surgical treatment plan, and between 46% (16/35; RT−ADT) and 32% (45/142; ADT +/−chemotherapy) among other management categories. Also, although only 18% (149/814) of men with regional disease reported the use of sexual aids overall, sexual aids were used by 48% (70/147) of men who had surgery (**Table S50**).

Overall, 15% (121/814) of men with regional disease reported moderate-to-big problems with feeling depressed (regardless of management strategy; **Table S50**). With the rates per individual management strategy ranging from 11% (17/152; ADT +/−chemotherapy) to 20% (7/35; RT−ADT).

Metastatic disease

Among men with metastatic disease who completed their PROMs questionnaires, 14% (181/1,342) reported moderate-to-big urinary bother overall (**Table S51**); and this outcome was reported at the highest rate in those who received surgery (15%, 8/53; **Figure 22**).

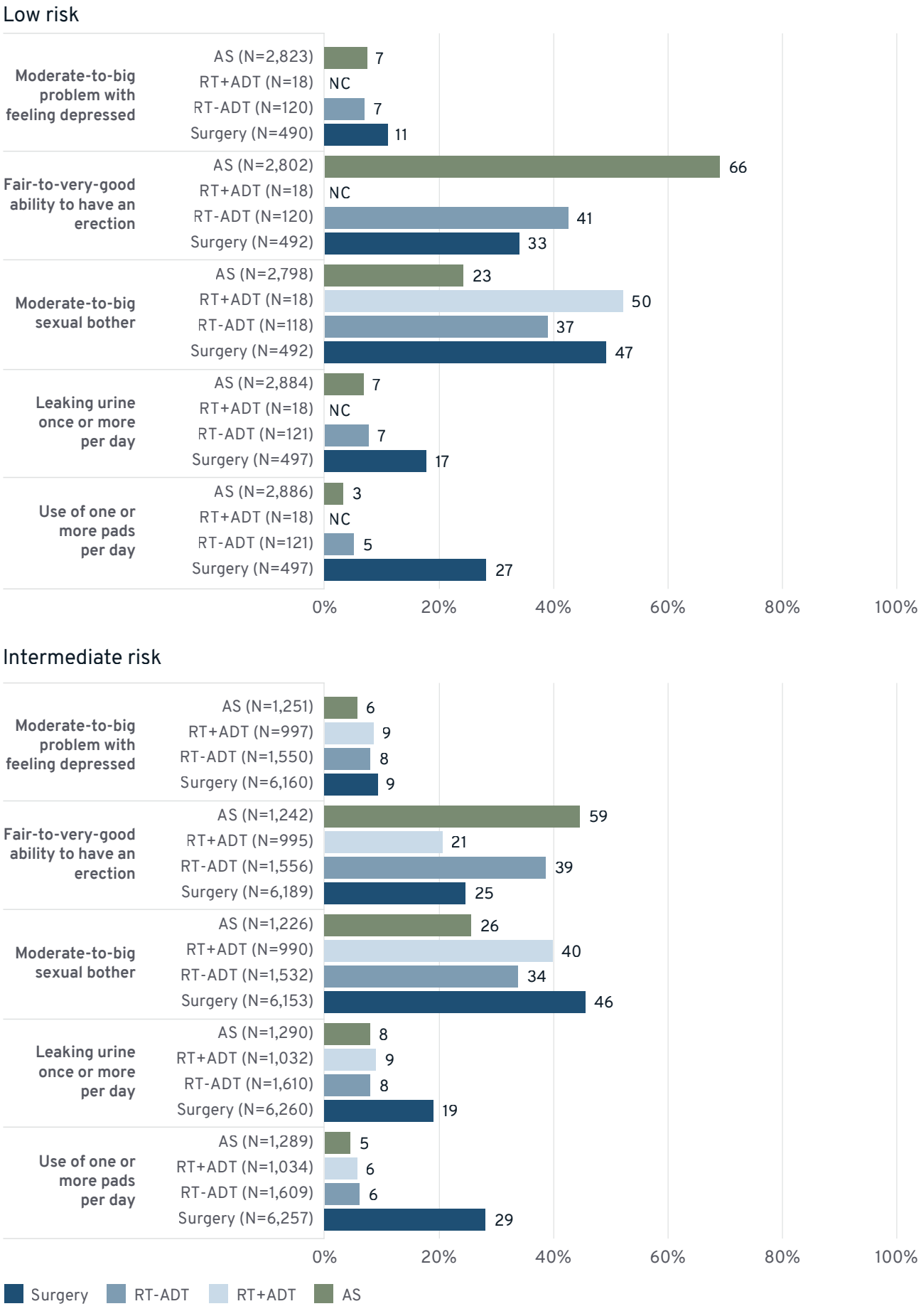
Although, overall, only 12% (156/1,354) of men with metastatic disease reported the use of one or more incontinence pads per day (**Table S51**); 2 in 5 (42%; 22/53) of those who received surgery reported use of one or more pads per day, and 1 in 4 (26%; 14/53) of those who received surgery reported leaking urine once or more per day (**Figure 22**).

Moderate-to-big bowel bother (**Table S51**), overall, was reported by 9.1% (122/1,343) of men with metastatic disease; and this outcome occurred at the highest rate (11.5%; 53/461) in those who received RT+ADT. However, only 3.4% (44/1,303) of men with metastatic disease reported a moderate-to-big problem with loss of bowel control overall.

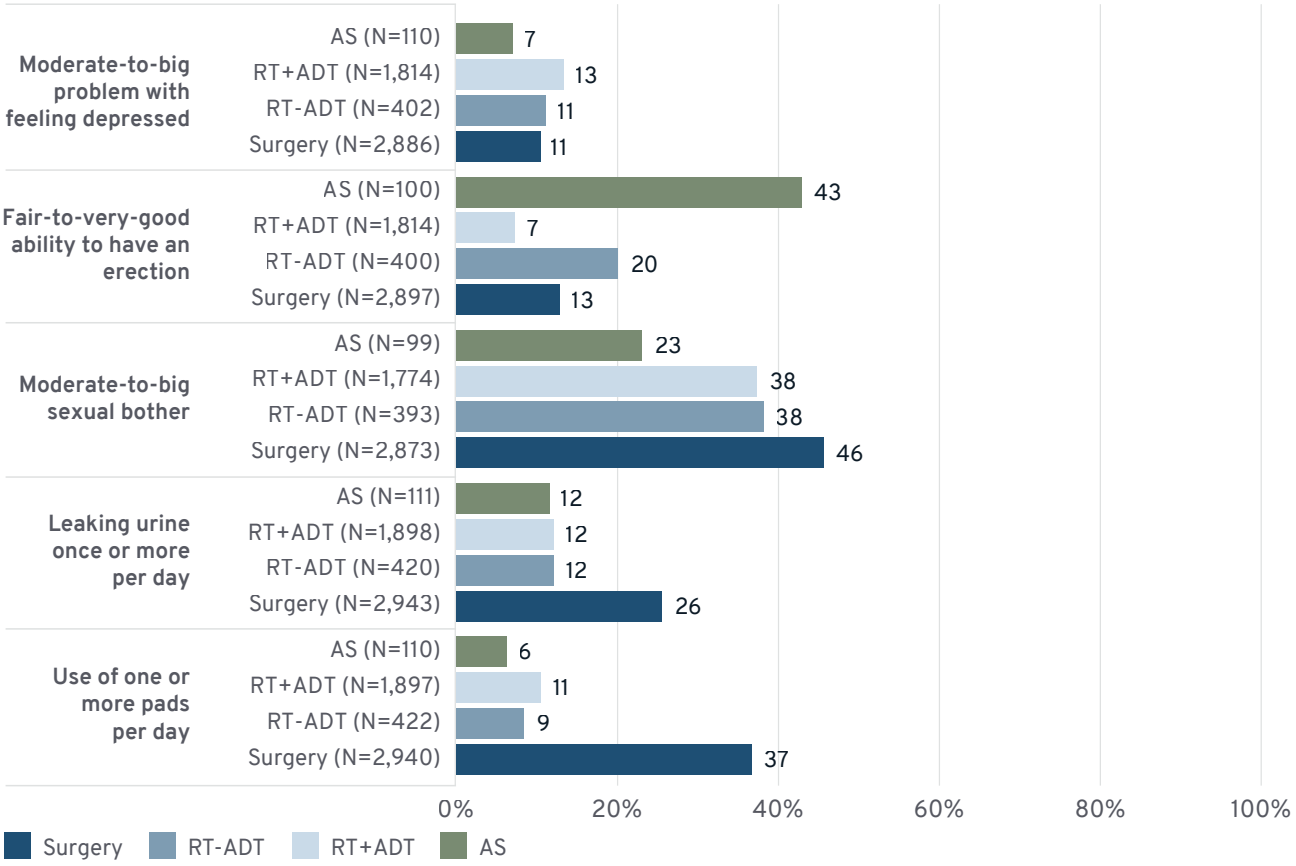
Moderate-to-big sexual bother was reported by over 1 in 3 men (35%; 441/1,255) with metastatic disease overall (**Table S51**); and by 44% (22/50) of the subgroup of men who received surgery (**Figure 22**). Use of sexual aids was reported by 12% (158/1,310) of men with metastatic disease overall, and by 43% (21/49) of men who received surgery (range 10–17% among other management strategies; **Table S51**).

Overall, 13% (171/1,311) of men with metastatic disease reported feelings of depression (regardless of management strategy) and the rates among individual management strategies were similar; ranging from 10% (5/49) in those who had surgery to 14% (63/458) in those who had RT+ADT (**Table S51**).

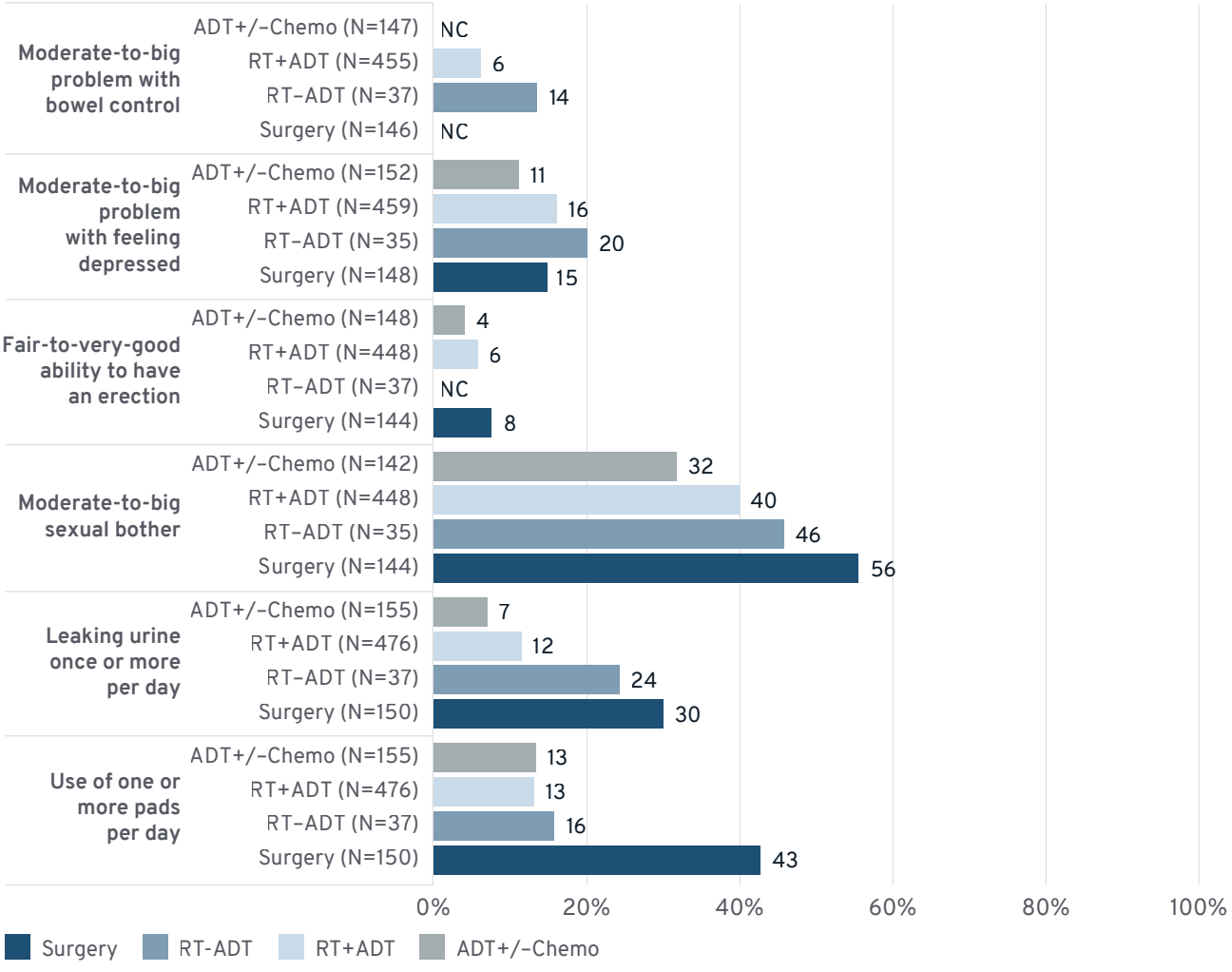
FIGURE 22: **PROPORTION OF MEN WHO REPORTED PROMS RESPONSES 12 MONTHS AFTER INITIAL MANAGEMENT PROVIDED, BY NCCN GROUP AND MANAGEMENT TYPE (2020–2022)**



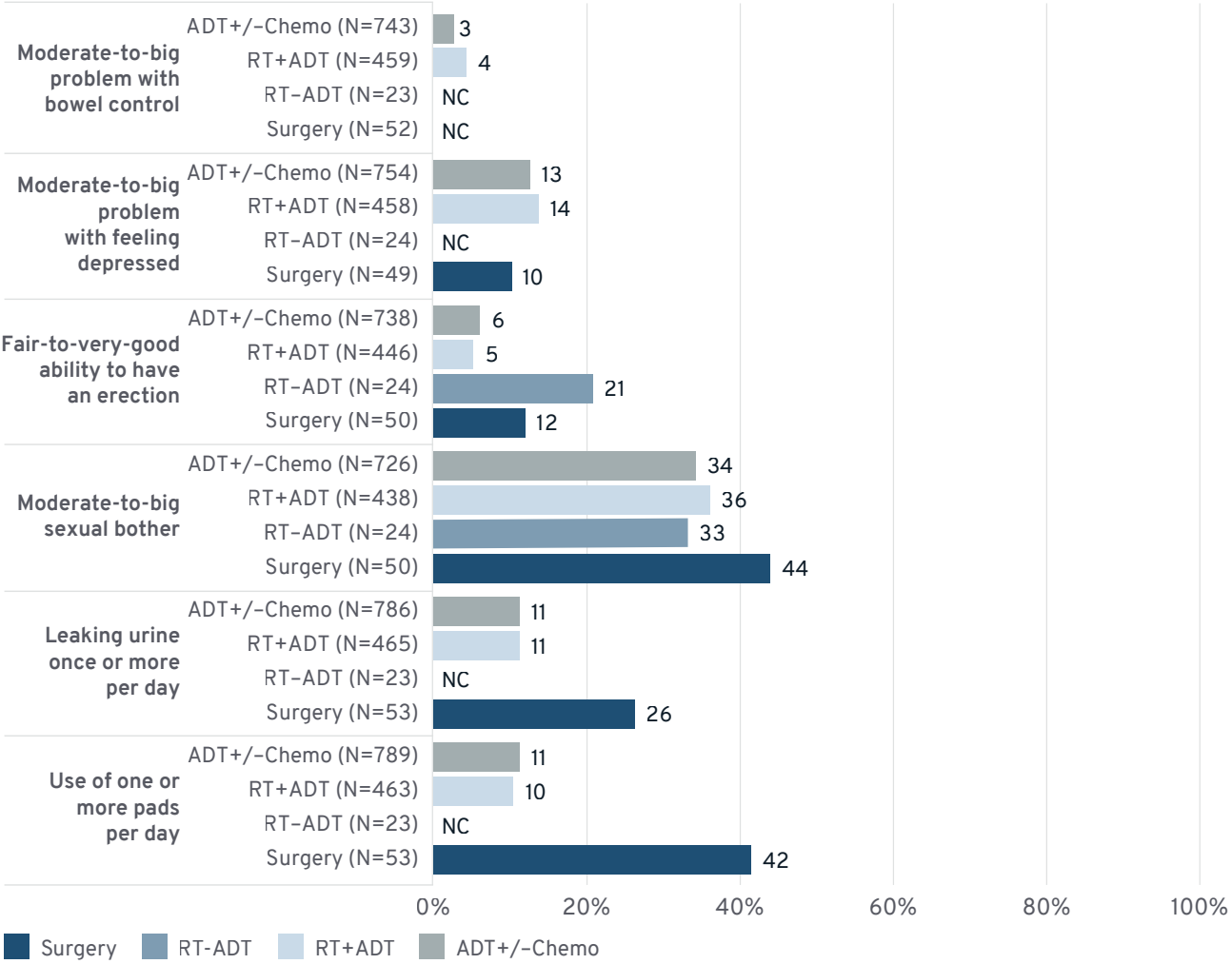
High risk



Regional disease



Metastatic disease



- These graphs are stratified by NCCN risk group, initial treatment, and the individual question from the EPIC-26 instrument.
- The numbers in brackets indicate the number of registrants who answered each individual question from each NCCN group or treatment group (regardless of the answer).
- For full data tables, refer to Table S47 (low risk); Table S48 (intermediate risk); Table S49 (high risk); Table S50 (regional disease); and Table S51 (metastatic disease).

PROMS, SURGERY AND AGE GROUP

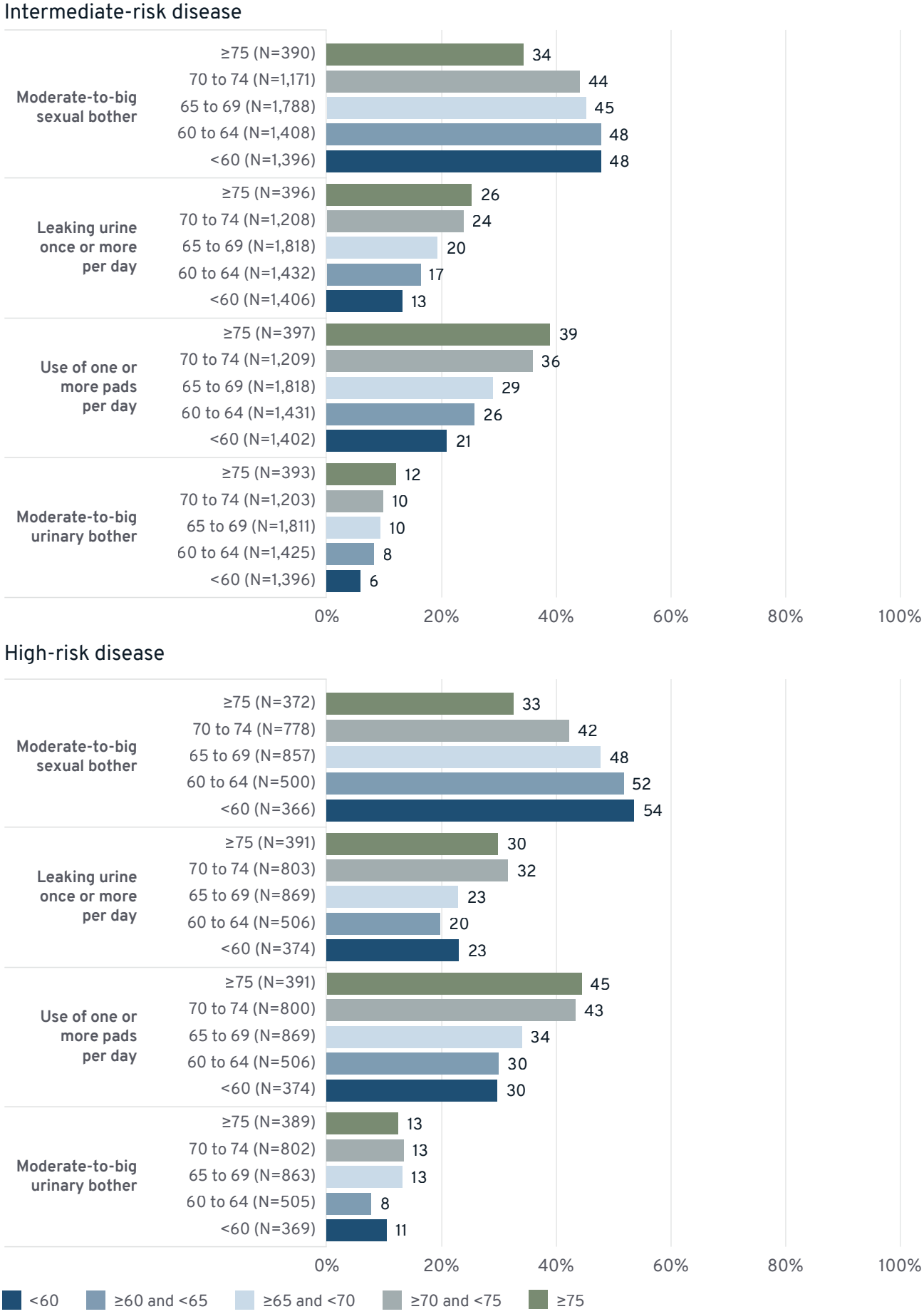
Among men with intermediate-risk disease who received surgery, moderate-to-big urinary bother was reported by an increasing number of men as their age group increased: from 6.2% (86/1,396) in the under 60 years age group, to 12% (48/393) in the over 75 years age group (**Figure 23**; **Table S52**). In men with high-risk disease (**Figure 23** and **Table S53**) this pattern was slightly different, with moderate-to-big urinary bother reported by 11% (39/369) of men under 60 years, 13% (49/389) of men over 75 years and 8% (40/505) of men in the 60–64 years age group.

Use of one or more incontinence pads per day in the intermediate-risk group was reported by 1 in 5 (21%; 295/1,402) men under 60; and increased across the age groups to almost 2 in 5 men (39%; 155/397) in the over 75's (**Figure 23** and **Table S52**). Among men with high-risk disease (**Figure 23**; **Table S53**) almost one third (30%; 111/374) of those less than 60 years of age reported use of one or more pads per day, and over 2 in 5 (45%; 174/391) of those over 75 years of age reported this outcome.

Leaking urine once or more per day was reported by 13% (187/1,406) of men with intermediate-risk disease in the less than 60 age group (**Figure 23** and **Table S52**); whereas, a quarter (26%; 101/396) of men in the greater than 75 years age group reported the same symptoms. In men with high-risk disease (**Figure 23** and **Table S53**) leaking urine at least once per day was reported by 23% (86/374) of men under 60 years and almost one third (30%; 117/391) of men over 75 years.

Moderate to big sexual bother was reported by 44–48% of men with intermediate-risk disease who were 60–74 years of age (**Figure 23** and **Table S52**) and by 34% (134/390) of men aged over 75 years. In men with high-risk disease (**Figure 23** and **Table S53**) between 42–54% aged 60–74 years reported moderate-to-big sexual bother, compared with 33% (121/372) of men aged over 75.

FIGURE 23: **PROMS RESPONSES 12 MONTHS AFTER SURGERY, IN MEN WITH INTERMEDIATE- OR HIGH-RISK DISEASE, BY AGE (2020–2022)**



- These graphs are stratified by NCCN risk group, initial treatment, and the individual question from the EPIC-26 instrument.
- The numbers in brackets indicate the number of registrants who answered each individual question from each NCCN group or treatment group (regardless of the answer).
- For full data tables, refer to Table S52 (intermediate risk); and Table S53 (high risk).

CHAPTER 5

DATA COMPLETENESS

PCOR-ANZ collects up to 993 variables on each registrant and this section provides data on the completeness of some of the key variables to provide additional context about the reliability of the data and therefore the findings. Data completion for variables included in this report is for 56,677 registrants for the period 2020–2022 with PROMs data up to September 2024 and is presented in **Table 14** and **Table 15**. We have reported on missing data for several of the variables in the text and in **Attachment 1: Supplementary Tables**. The values presented in this section are aggregates of jurisdictional data across 3 years, unless stated otherwise. To ensure that we improve data completeness, a project is underway to identify the causes of missing data and guide solutions. One area of focus will be the way in which data is recorded as 'missing' or 'unknown'. A field may be missing a value because the information is unavailable in the primary record at the time it was collected, and this is classified as 'missing', or that the primary record listed it as being 'unknown' meaning it will not be collected at any time point. Understanding the reasons for a value not being available is important and the review will seek to address this.

Two other areas of focus will be to increase the completeness of PSA at diagnosis and to examine why a large proportion of clinical T category is missing (53% [29,978/56,677] of registrants across 2020–2022, **Table 14**). As a result of the missing components, 19.4% (11,006/56,677) of registrants have been unable to be classified to an NCCN risk category. Reasons for missing data are complex and relate to access to complete records and local recording practices.

TABLE 14: **DATA COMPLETENESS FOR INCLUDED VARIABLES**

2020–2022		
Analysis parameter	n/d	%
Population characteristics		
Postcode (Aus and NZ)	56,578/56,677	100%
Date of Birth	56,677/56,677	100%
MMM (Derived variable, Aus Only)	46,408/46,505	100%
SES (Derived variable, Aus Only)	46,324/46,505	100%
Diagnosis		
Date of diagnosis	56,677/56,677	100%
Method of diagnosis	53,812/56,677	95%
NCCN risk group@	45,671/56,677	81%
Gleason Score	48,815/56,677	86%
PSA level at diagnosis (within 6 months)	46,030/56,677	81%
PSA level at 12 months	33,865/56,677	60%
Clinical T category	29,978/56,677	53%
Clinical N category	49,237/56,677	87%
Clinical M category	49,246/56,677	87%
Clinical TNM category	32,082/56,677	57%
ISUP Group	48,815/56,677	86%
MRI Status (Pre-biopsy MRI**)	47,750/56,677	84%
Management		
12-month Treatment Summary Score	54,573/56,677	96%
Surgery date	19,160/19,167	100%
External beam radiotherapy date	11,147/11,773	95%
Brachytherapy date	969/969	100%
Surgery institute type	18,810/19,167	98%
Radiotherapy institute type#	11,839/12,742	93%
Radiation therapy dose	10,483/11,773	89%
Radiation therapy fraction	10,447/11,773	89%
Surgical approach	18,015/19,167	94%
Pathologic T stage (Surgery)	18,124/19,167	95%
Surgical margins	18,321/19,167	96%
2015–2022		
MRI Status (Pre-biopsy MRI**)	99,055/105,074	94%

Note: Data completeness is determined by the presence of entered data into a data field. The proportions of completeness provided in this table include instances where a data collector has selected 'unknown' as a response for the data item, as this is considered a valid response and therefore is not classified as 'missing'.
n, numerator; d, denominator; MMM, Modified Monash Model; SES, Socioeconomic Status; PROMs, Patient-reported outcome measures; NCCN, National Comprehensive Cancer Network; PSA, Prostate-specific antigen.
#Combines external beam radiotherapy institutes and brachytherapy institutes.
@Refer to Table 1 for how Gleason grades, clinical T/N/M, and diagnosis PSA level are used to calculate the NCCN risk classification.

**Excludes SA data.

TABLE 15: **12-MONTH PROMS COMPLETENESS 2020–2022**

	2020–2022	
Analysis parameter	n/d	%
PROMs returned with at least one question answered*	25,875/56,677	46%
PROMs with no answered questions#	85/56,677	0.15%
Sexual Summary Score	25,041/25,875	97%
Sexual Bother	24,534/25,875	95%
Ability to have an erection	24,800/25,875	96%
Quality of erection	24,585/25,875	95%
Ability to function sexually	24,490/25,875	95%
Interest in sex	25,048/25,875	97%
Sexual aid use†	25,199/25,875	97%
Urinary Continence Summary Score	25,787/25,875	100%
Urinary Obstruction Summary Score	25,453/25,875	98%
Use of medications or devices to aid or improve erections (Derived variable)	25,199/25,875	97%
Urinary Bother	25,514/25,875	99%
Leaked Urine	25,685/25,875	99%
Number of urinary pads used	25,688/25,875	99%
Bowel Bother	25,519/25,875	99%
Bowel Summary Score	25,740/25,875	100%
Losing bowel control	25,136/25,875	97%
Hormonal Summary Score	25,392/25,875	98%
Feeling depressed	24,984/25,875	97%
Lack of energy	25,174/25,875	97%
PROMS completed 2015–2022		
PROMs returned with at least one question answered*	55,815/114,716	49%
PROMs with no answered questions^	248/114,716	0.22%

*PROMs received with at least one question answered were regarded as being a completion. #There were 85 PROMs from patients diagnosed between 2020 and 2022 that were returned blank (mail), or the patient refused to answer any questions (mail, phone, or email). ^There were 248 PROMs from patients diagnosed between 2015 and 2022 that were returned blank (mail), or the patient refused to answer any questions (mail, phone, or email). †Sexual aid is a constructed variable as described in the methods section.

CHAPTER 6

DISCUSSION AND FUTURE DIRECTIONS

PCOR-ANZ is one of the world's largest longitudinal prostate cancer registries, comprising eight jurisdictional datasets and expanding to include WA in 2025, further strengthening its international reach and impact. The estimated bi-national population coverage in 2022 for PCOR-ANZ was 72% and for PCOR-NZ alone it was 83%, while coverage for Australian States and Territories was 70%. This very high level of bi-national coverage underpins the vital role that the PCOR-ANZ dataset plays in both current and future research and clinical quality improvement initiatives.

In June 2024, the successful completion of data migration from the Monash HELiX system to the Dacima Software platform marked a significant milestone. This transition has enabled improved data collection, highlighted opportunities to enhance reporting capabilities, and fostered shared learning through review of jurisdictional workflows. Migration to the Dacima Software platform also enables us to focus on moving towards increased data automation to streamline operations and support the long-term financial sustainability of the registry.

PCOR-ANZ continues to be a leader in the collection and use of PROMs. Our approach to PROMs collection 12 months following treatment, allows us to continue to document the breadth of impacts to men who have received treatment for their cancer. In recognition of the added value that collection of baseline PROMs can provide to more fully understand the impacts of treatment, efforts are underway to improve early case identification and expand PROMs collection, with potential implications for workflow redesign across jurisdictions.

POPULATION CHARACTERISTICS

Over the reporting period, there was an increase in the number of annual registrations from 17,247 in 2020 to 20,550 in 2022. There has also been a shift towards older age at diagnosis, with the proportion of men diagnosed under 60 years decreasing from 17% in 2020 to 15% in 2022, while diagnoses in men aged 75 years and older increased from 22% to 25% over the same period. Rural and remote representation also increased from 28% in 2020 to 29% in 2022. In Australia, socioeconomic distribution of registrants remained stable over the reporting period.

DIAGNOSIS

There has been a large increase in pre-biopsy MRI use from 5.6% (2015) to 73% (2022), aligned with Medicare rebates introduced in 2018 in Australia, with usage most prevalent in localised disease (77%). We also anticipate future increases to pre-biopsy MRI use in Australia with future changes in eligibility to Medicare rebates. While NZ's rate of pre-biopsy MRI is increasing, there are likely to be ongoing accessibility challenges for men living in non-metropolitan areas. Transperineal (TP) biopsy is now the most common method of prostate cancer diagnosis across PCOR-ANZ, used in 73% of cases in Australia between 2020 and 2022, though it remains less common in NZ (30%) and the NT (15%), where transrectal ultrasound-guided biopsy (TRUS) continues to be the predominant approach.

Overall, intermediate-risk cases constituted the most common diagnosis group, comprising 45% of the total diagnoses between 2020–2022. The proportions of registrants falling into low, intermediate, high and regional/metastatic risk groups also remained relatively stable over the three years analysed in this report.

MANAGEMENT

Active Surveillance

In 2020, 81% of men with low-risk prostate cancer were managed with AS, increasing to 85% by 2022. The proportion of AS for intermediate-risk disease was relatively stable over this period. Importantly, the majority of men who commenced AS remained on it at 12 months (low-risk: 95%, intermediate-risk: 93%).

Timeliness of Active Treatment

For men with high-risk disease undergoing surgical treatment, the majority (69%) received treatment within the recommended 90 days following diagnosis. However, the rate was lower among men with intermediate-risk disease (58%) and lowest for low-risk disease (35%). Notably, the surgical institution type appears to be related to treatment timeliness, with 74% of men treated within 90 days in private settings, compared with only 26% in public settings. In private settings, 81% of high-risk men received surgery within 90 days, compared with 34% in public settings. Men from higher SES groups were also more likely to receive surgery within 90 days of diagnosis (30% vs. 21% in public; 79% vs. 63% in private) compared with those from lower SES groups, regardless of treatment setting.

Timeliness of radiation therapy or radiation therapy plus ADT also varied by NCCN risk group. Men with low-risk prostate cancer had the lowest rates of treatment within 90 days (23–30%). For high-risk patients, 32% received RT alone and 82% received RT+ADT within 90 days. The highest rates of timely RT+ADT were observed in men with metastatic (93%) and regional disease (87%).

Surgical Approach and Margins

Most surgical procedures involved robotic-assisted surgery, with an increase from 70% in 2020 to 79% in 2022. Most robotic surgeries occurred in private institutes (87%); whereas 69% of open surgeries are performed in public institutes. In men with pT2 disease, the risk-adjusted margin positivity rate was 14.57% (95% CI: 13.83–15.32%), whereas in those with pT3/4 disease, overall, the risk-adjusted margin positivity rate was 37.4% (95% CI: 36.3–38.5%).

Radiation Therapy and Curative Intent

There is an increase in the proportion of men who had hypofractionated radiation therapy from 70% in 2020 to 82% in 2022. From 2020–2022, 91% (9,759/10,686) of men treated with curative intent received 74 Gy in 2 Gy fractions. Across NCCN groups, 87–97% of men received curative EBRT, with the highest rates seen in low-risk disease (97%) and lowest rates in regional disease (87%), where treatment is often palliative.

PROMS

Across 2020–2022, PROMs questionnaires were completed by 46% of PCOR-ANZ registrants, with considerable variation in completion rates observed both between jurisdictions and over time. The PROMs reported from 2020–2022 are consistent with those previously reported.[1]

Overall, there is more incontinence and erectile dysfunction in surgical patients; but relatively more bowel bother in patients who received RT (which is also made worse by combination with ADT). Although in absolute number terms, big problems with bowel control after any treatment were uncommon, ranging from 2–9%.

Among men with low-risk disease, 27% of those who received surgery and 3% of those managed with AS reported the use of one or more incontinence pads per day. Similarly, in men with intermediate-risk disease, 19% of those who received surgery and 8% of those who were managed with AS reported leaking urine at least once a day. For men with regional disease, regardless of management strategy, 17% reported needing to use at least one pad per day, with the highest proportion of pad use in this risk group seen in those who had surgery, at 43%.

In the sexual domain, among men with high-risk disease, a fair-to-very-good ability to have an erection was reported by 43% of men managed with AS, 20% of men receiving RT without ADT, 13% of men receiving surgery, and 7% of men receiving RT with ADT. Whereas in men with metastatic disease, 43% of those who received surgery reported using sexual aids, while the average rate of sexual-aid use among men in the metastatic group as a whole was 12%. However, men who had intermediate-risk disease reported the highest proportions of sexual bother among all risk categories, ranging from 32% in men who had ADT +/–chemotherapy to 56% in men who had surgery.

DATA COMPLETENESS

Data completeness is highlighted in this report, with further detail provided in the supplementary tables, to support interpretation of the results. We think that we have sufficiently high rates of capture that our conclusion are 'qualitatively' robust if quantitatively inexact, and that much of the missing data is 'missing-at-random'. Nevertheless, any gaps in data capture warrant careful consideration and ongoing review. This has renewed the focus of PCOR-ANZ on data completeness and quality through several planned projects. Movember, the Monash Data Coordinating Centre and the Jurisdictional PCORs, are reviewing the Quality Indicator Reports and Data Dictionary variables to ensure clinical relevance and support effective interpretation and use of the data. These efforts aim to make sure the registry reflects contemporary diagnostic and treatment practices, while balancing data collection challenges and maximising data utility. A refined focus also enables us to have a future focus on priority clinical areas, which will maximise benefits to men living with prostate cancer.

VALUE OF THE PCOR-ANZ DATASET

As a research asset, the full registry dataset provides greater value than isolated jurisdictional data. Work is progressing to streamline the data access process for researchers, while maintaining ethical and legal compliance. In partnership with Movember, a refined data-access strategy and communications plan is being developed to support and promote the responsible use of registry data. Future discussions should also centre around potential data linkages with clinical trial groups such as ANZUP and TROG, as well as national real-world datasets, to further enrich research capacity.

Together, these initiatives strengthen the role of PCOR-ANZ in improving prostate cancer care and outcomes through collaboration, innovation, and the generation of meaningful, high-quality data. Overall this bolsters the case for increased health-system support and highlights the need to construct a learning infrastructure based around the registry effort; with the aim of enabling the system to become sentient and learn from what we can observe.


patagonia
TOYOTA

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