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Medical Radiation Practitioners in Australia

While the number of medical radiation practitioners continues to grow, there remains a workforce shortage across Australia.

Medical radiation practitioners (MRPs) play a critical role in the Australian healthcare system by providing essential diagnostic imaging and radiation therapy services. These allied health professionals are responsible for operating advanced medical imaging equipment such as X–radiation (X–ray), Computed Tomography (CT), Magnetic Resonance Imaging (MRI), and nuclear medicine scanners, as well as delivering targeted radiation treatments to patients with cancer and other conditions.

The MRP profession encompasses 3 main divisions:

1. Diagnostic radiographers, who perform imaging procedures
2. Radiation therapists, who plan and administer radiation treatments and
3. Nuclear medicine technologists, who use radiopharmaceuticals to diagnose and treat diseases.

While MRPs work collaboratively with other healthcare professionals, such as sonographers to deliver high-quality and patient-centred care, sonographers are not included in the modelling. This exclusion does not affect demand estimates but means that the model does not capture potential future changes in workforce composition. For additional caveats, refer to the limitations section.

Geographic maldistribution remains a persistent challenge, with 79.9% of MRPs located in metropolitan areas and only 20.1% serving regional, rural and remote communities.[1] This imbalance is concerning given that approximately 30% of Australia’s population resides outside metropolitan areas,[2] highlighting the disparity between workforce distribution and population need.

As healthcare demand grows - particularly in cancer and chronic disease management - the role of MRP workforce becomes increasingly important. Data from the Australian Institute of Health and Welfare (AIHW) and Australian Bureau of Statistics (ABS) indicate that Australia’s population is projected to grow by 12%, (approximately 3.3 million people - between 2024 and 2033). During the same period, cancer incidence is forecast to rise by 22%, with an estimated 204,000 new cancer cases expected in 2033 alone. In total, around 1.9 million cancer diagnoses are anticipated between 2024 and 2033[3]. Given that medical radiation services are essential for the diagnosis and treatment of cancer, this projected rise in cancer cases is likely to drive a substantial increase in demand for these services.

[1] Australian Health Practitioner Regulation Agency (Ahpra), 2023, Medical Radiation Practice Board, 2023, Medical radiation practitioners – a snapshot as at 30 June 2023, accessed 7 July 2025.
[2] Australian Institute of Health and Welfare, 2025, Profile of Australia's population, accessed 1 July 2025.
[3] Australian Institute of Health and Welfare, 2024, Cancer, accessed 1 July 2025.

Despite these pressures, MRPs continue to adapt to evolving technologies and clinical practices, contributing to innovation in patient care and playing a vital role in early detection, treatment and disease management. The emergence of advanced technologies such as artificial intelligence (AI) presents promising opportunities to enhance workforce productivity and improve service delivery efficiency. However, the full impact of these emerging technologies remains uncertain, as they are still developing and difficult to reflect accurately in current workforce modelling. As evidence on adoption and implementation becomes available, future updates of this study will aim to assess their impact.

This study provides a comprehensive analysis of the current and projected supply and demand for MRPs, offering an evidence-based foundation to inform strategic workforce planning and policy development.

Please note that the modelling reflects the combined public and private workforce. As such, states and territories should interpret the projections in the context of their own public-private workforce distribution and service delivery models.

Summary of results

Although the MRP workforce is expected to grow over the next 15 years, the workforce is projected to experience a shortage throughout the projection period (2024–38).

The national level projections from the MRP model (Table 1 and Figure 1) paint a picture of the future supply and demand trends for MRPs over the coming decade.

The MRP workforce is projected to grow from 16,801.5 full-time equivalent (FTE) in 2025 to 21,578.1 FTE by 2038. This growth corresponds to an increase in the number of individual MRPs, from 18,315 in 2025 and 23,873 in 2038.

Demand for radiation services is also projected to rise, with FTE demand rising from 17,098.3 FTE in 2025 to 25,681.2 FTE by 2038. This translates to a required headcount of 18,639 MRPs in 2025 and 28,411 by 2038.

The current model incorporates historical productivity trends under the assumption that these patterns will continue in the future. As a result, it may not fully capture the impact of emerging changes in productivity enhancements, service delivery models or clinical workflows. The true effect of these evolving technologies and treatments remains uncertain and is challenging to reflect accurately in the current workforce modelling.

Despite projected growth in supply, the MRP workforce is expected to remain in shortage throughout the projection period. In 2025, the estimates indicate a shortfall of 296.8 FTE representing a 1.8% gap between supply and demand. This shortage is expected to increase, reaching 4,103.1 FTE (19.0%) by 2038. In terms of headcount, the estimates indicate a shortfall of 324 MRPs in 2025, increasing to 4,538 by 2038.

The proportion of MRPs (headcount) aged under 30 is expected to decline from 29.4% in 2025 to 22.6% by 2038, with entry rates projected to fall from 6.6% in 2025 to 5.0% by 2038. The key driver for this projected decline is that the number of MRPs entering the workforce is assumed to be constant throughout the projection period based on estimates from the Australia’s Future Health Workforce (AFHW) dataset. This assumption was validated through stakeholder consultations.[4] At the same time, the existing workforce is ageing with the share of those aged 40–49 and 50–59 projected to increase (Table 6). While the evidence is limited, there are some indications that the sector maybe experiencing challenges in attracting and retaining students, particularly due to demanding entry requirements and limited placement opportunities. This highlights the need for strategic workforce planning to maintain a sustainable pipeline of skilled professionals.

The study further highlights that all 3 MRP professions – diagnostic radiographers, radiation therapists and nuclear medicine technologists – are expected to experience persistent shortages throughout the projection period. Table 1 presents national projections by practitioner type, highlighting the growing gap between supply and demand across each profession.

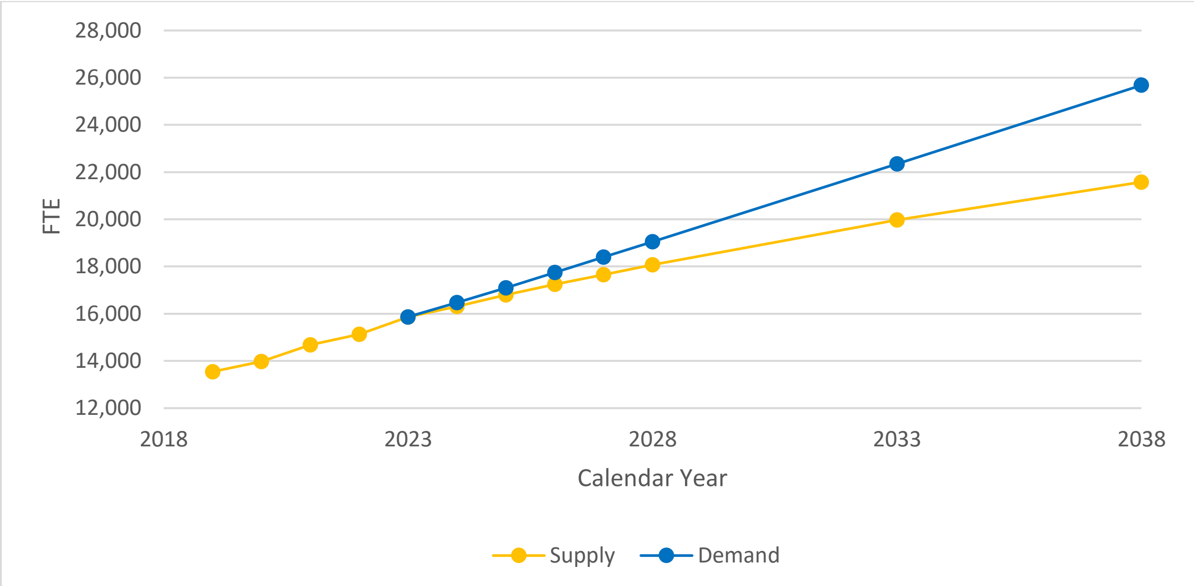
The main challenge with this study has been understanding demand for non-MBS funded radiation therapy and nuclear medicine services due to the lack of consistent data on utilisation in admitted and emergency care settings at both state and national levels. This inconsistency stems from variations in funding arrangements across jurisdictions. In some states and territories, these services are funded directly by hospitals through activity-based funding models, which are not captured under the Medicare Benefits Schedule (MBS). As a result, non-MBS funded services could not be included in the current modelling. To enable a comprehensive and understanding of medical radiation and nuclear medicine utilisation across Australia, consistent and reliable data collection is therefore needed.

Table 1: National projections (FTE) by practitioner type, 2025 and 2038

	Total workforce		Diagnostic radiographer		Radiation therapist		Nuclear medicine technologist	
	2025	2038	2025	2038	2025	2038	2025	2038
Supply	16,801.5	21,578.1	13,199.7	16,957.2	2,411.8	3,087.9	1,190.1	1,533.0
Demand	17,098.3	25,681.2	13,446.7	20,046.4	2,454.1	3,798.0	1,197.5	1,836.7
Surplus / Shortfall	-296.8 (-1.8%)	-4,103.1 (-19.0%)	-247.0 (-1.9%)	-3,089.3 (-18.2%)	-42.3 (-1.8%)	-710.1 (-23.0%)	-7.4 (-0.6%)	-303.7 (-19.8%)

[4] There is currently no publicly available data on the number of domestic graduates and internationally trained MRPs entering the workforce. Consequently, the Australia's Future Health Workforce (AFHW) dataset has been used to estimate new workforce entries. Based on the average number of new entrants between 2019 and 2023, it is assumed that 1,202 MRPs will enter the workforce annually throughout the projection period. This assumption was validated through stakeholder consultation and considered reasonable, given the sector does not anticipate significant changes in medical radiation graduate numbers in the near future.

Figure 1: FTE National Projections for MRPs: Supply vs demand, 2018–38



Workforce Profile

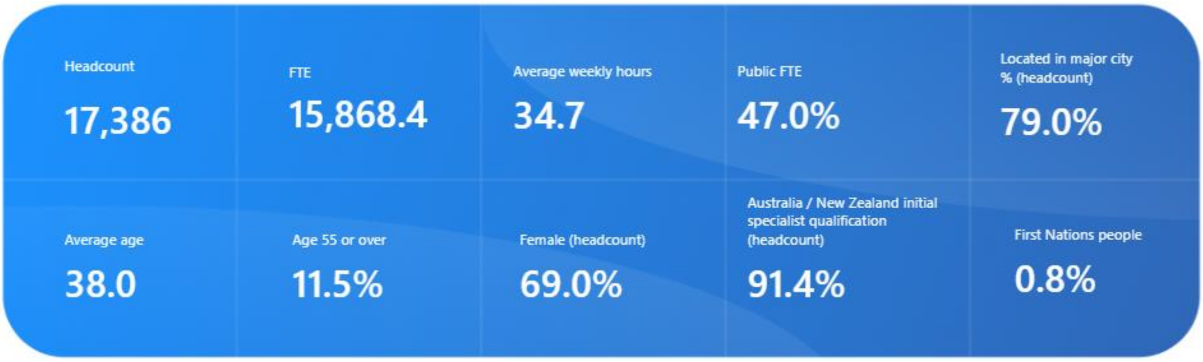
The following section presents a snapshot of the current workforce using the latest available supply data, 2023. It also summaries historical trends observed from 2019–23.

Quick facts

In 2023, there were:

- 17,386 MRPs with average weekly hours of 34.7 that equates to 15,868.4 FTE MRPs. This total FTE consists of 14,531.6 FTE Australian/New Zealand graduates (those with initial qualification from Australia or New Zealand) and 1,336.7 FTE overseas trained MRPs (those with initial qualification from overseas).
- 11,989 female and 5,397 male MRPs.

Figure 2: Quick facts on MRP workforce, 2023



Practitioner types[5]

Table 2 shows summary statistics by practitioner types with key highlights as follows. In 2023:

- There were 13,745 diagnostic radiographers (headcount) accounting for 79.1% of the MRP workforce, followed by radiation therapists (14.2%) and nuclear medicine technologists (6.7%).
- Nuclear medicine technologists worked the longest average hours at 35.9 per week while diagnostic radiographers and radiation therapists worked marginally less hours at 34.6 and 34.7 per week respectively.
- Overall, 47.0% of the FTE MRPs worked in the public sector. While most radiation therapists (60.5%) were employed in the public sector, just over half of diagnostic radiographers and nuclear medicine technologists worked in the private sector.

Table 2: Summary statistics by practitioner type, 2023

Practitioner Type	Headcount	Average weekly hours	FTE	Public FTE (%)	Private FTE (%)
Diagnostic radiographer	13,745	34.6	12,506.1	44.9	55.1
Radiation therapist	2,470	34.7	2,254.9	60.5	39.5
Nuclear medicine technologist	1,171	35.9	1,107.3	43.6	56.4
Total	**17,386**	**34.7**	**15,868.4**	**47.0**	**53.0**

Workforce trends and distribution

Table 3 provides the MRP workforce trends, with key highlights as follows:

- The number of MRPs increased from 15,002 in 2019 to 17,386 in 2023 reflecting a Compounded Annual Growth Rate (CAGR) of 3.8%. However, FTE workforce grew at

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[5] MRPs are assigned a practitioner type based on the division under which they are registered which are: 1. Diagnostic radiography; 2. Radiation therapy or 3. Nuclear medicine technology. Although practitioners may hold registration in multiple divisions, it is relatively uncommon. In 2022, only 14 practitioners were registered across two divisions—12 in both nuclear medicine technology and diagnostic radiography, and 2 in both radiation therapy and diagnostic radiography. For this modelling, each dual-registered practitioner is assigned to a single division to avoid double-counting individuals or FTE hours. Unlike the nursing and midwifery survey which captures division specific information, the MRP workforce survey does not collect division-specific data. As a result, division assignment was based on a hierarchical approach—practitioners are first allocated to nuclear medicine technologist, then to radiation therapist, and finally to diagnostic radiographer. This reflects the relative size of each division.

CAGR of 4.0% during the same period, driven by a slight increase in the average hours worked.

- Overall, the average weekly hours worked increased slightly from 34.3 in 2019 to 34.7 in 2023, reflecting a CAGR of 0.3%.
- The proportion of FTE MRPs employed in the public sector declined slightly from 48.7% in 2019 to 47.0% in 2023, reflecting a negative CAGR of 0.9%.

Table 3: Workforce trends, 2019–23

Year	2019	2020	2021	2022	2023	CAGR (%)
Headcount	15,002	15,554	16,256	16,553	17,386	3.8
Average weekly hours	34.3	34.1	34.3	34.7	34.7	0.3
FTE	13,546.1	13,973.6	14,685.3	15,126.0	15,868.4	4.0
Public FTE (%)	48.7	49.0	47.6	46.5	47.0	-0.9
Private FTE (%)	51.3	51.0	52.4	53.5	53.0	0.8

Sector trends by practitioner type

- The majority of diagnostic radiographers and nuclear medicine technologists work in the private sector, while most radiation therapist work in public sector.
- Between 2019 to 2023, the proportion of the workforce (FTE) working in the public sector declined by 1.4% for diagnostic radiographers, 2.3% for radiation therapists and 2.0% for nuclear medicine technologist.

Table 4: Sector trends by practitioner type, 2019–2023

Practitioner type	2019	2020	2021	2022	2023
Diagnostic radiographer					
Total FTE	10,559.2	10,928.1	11,488.2	11,890.7	12,506.1
Public FTE (%)	46.3	46.8	45.5	44.6	44.9
Radiation therapist					
Total FTE	2,017.4	2,050.6	2,152.5	2,171.6	2,254.9
Public FTE (%)	62.8	62.7	61.0	58.1	60.5
Nuclear medicine technologist					
Total FTE	969.6	994.9	1,044.6	1,063.7	1,107.3
Public FTE (%)	45.6	44.6	43.7	43.3	43.6

Demographics

Table 5 shows FTE by sex and age groups with key highlights as follows:

- Overall, the proportion of female FTE MRPs increased slightly from 64.6% in 2019 to 65.5% in 2023.
- Between 2019 and 2023, the age distribution of MRPs remained relatively stable, with a 2.5% increase in the FTE share for the under 30 age group and around 1.0% decline for those aged 30–39 and 60 and over years.

Table 5: FTE MRPs by sex and age groups, 2019 and 2023

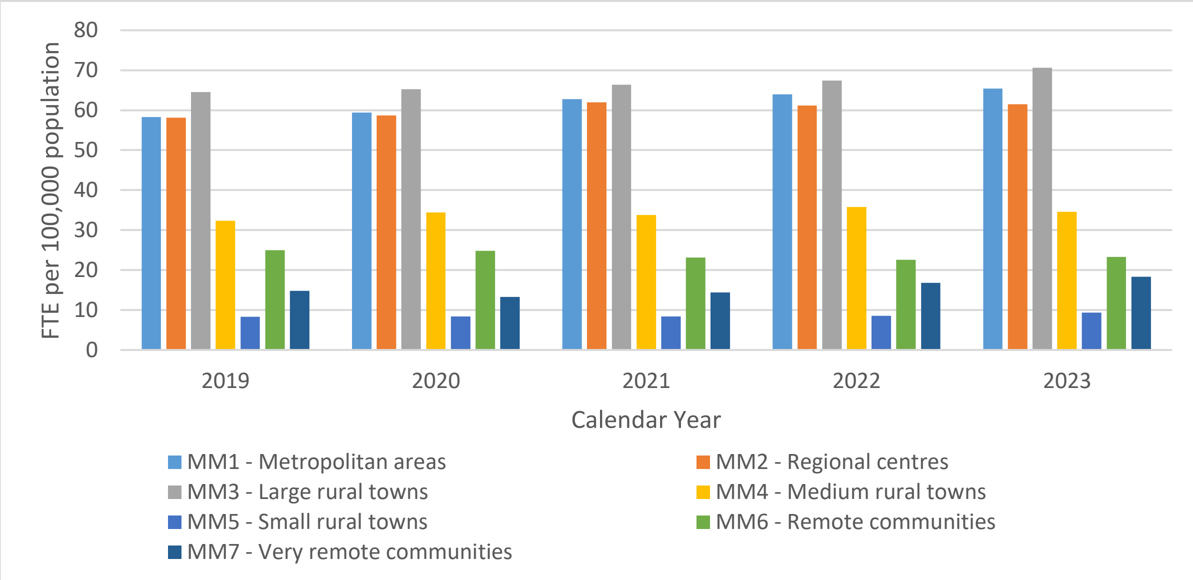
	2019			2023		
Age group	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Under 30	1,149.1	2,999.3	4,148.4 (30.6%)	1,444.0	3,807.9	5,251.9 (33.1%)
30-39	1,584.1	2,690.6	4,274.7 (31.6%)	1,747.3	3,089.5	4,836.7 (30.5%)
40-49	1,023.6	1,530.1	2,553.7 (18.9%)	1,171.3	1,850.8	3,022.1 (19.0%)
50-59	659.9	1,010.3	1,670.2 (12.3%)	730.6	1,141.5	1,872.1 (11.8%)
60 and over	375.2	523.9	899.1 (6.6%)	373.5	512.0	885.5 (5.6%)
Total	4,792.0	8,754.2	13,546.1 (100%)	5,466.7	10,401.7	15,868.4 (100%)

Full-Time Equivalent (FTE) MRPs by Modified Monash Model (MMM) 2023[6]

In 2023, the FTE MRPs per 100,000 population in metropolitan areas (Monash Modified–Category 1 (MM1)) was 65.4, compared to 61.5 in regional centres (MM2), 70.6 in large rural towns (MM3), 34.6 in medium rural towns (MM4) and only 9.4 in small rural towns (MM5), see Figure 3.

[6] For description of Monash Modified Model please refer to Modified Monash Model.

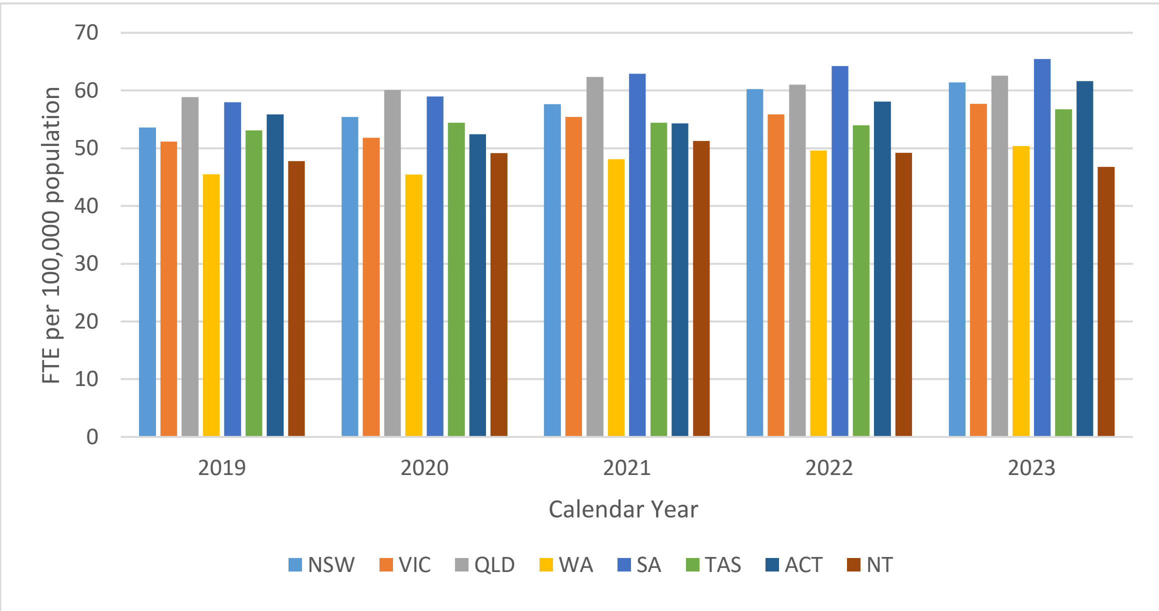
Figure 3: FTE MRPs per 100,000 population by Modified Monash Model (2023), 2019–23



Full-Time Equivalent (FTE) MRPs by state and territories

In 2023, across jurisdictions, South Australia (SA) had the highest FTE MRPs per 100,000 population at 65.5, while the Northern Territory (NT) had the lowest at 46.8, see Figure 4.

Figure 4: FTE MRPs per 100,000 population by states and territories, 2019–23



For more details on trends in FTE and average hours worked by sex, place of initial medical qualification and practitioner type, please refer to the Medical Radiation Practice Supply Profile Dashboard.

What is supply and demand modelling?

Supply and demand modelling is a tool used to understand how much of something is available (supply) and how much is needed (demand).

Effective health workforce planning is a key instrument for a resilient and sustainable health system. Health workforce modelling provides insights into the current and projected health workforce, playing an integral role in workforce planning to ensure we have the workforce we need and where they are most needed.

This MRP supply and demand study provides valuable insights into the MRP workforce, helping to identify potential workforce gaps. By quantifying the projected supply and demand for MRPs from 2024 to 2038, using data collected from several sources between 2014 and 2023, the study provides important evidence to guide workforce reform and inform policy decisions on regulation, education and training of MRPs.

Methodology for the medical radiation practice supply and demand model

To enable detailed scenario modelling of the MRP workforce, a combination of microsimulation and time series regression modelling approaches for supply and demand is used.

Microsimulation is a technique for modelling the behaviour of individuals according to predetermined probabilistic rules. Time series regression is a statistical method for predicting future values based on the response history and the influence of relevant predictors.

The microsimulation approach provides maximum flexibility for adapting the model to different populations and unique supply and demand scenarios. This enhances understanding of the effects of existing policies and helps identify ways to improve them.

For detailed information on the methodology, refer to the Medical Radiation Practice Supply and Demand Model - Methodology Paper.

Overview

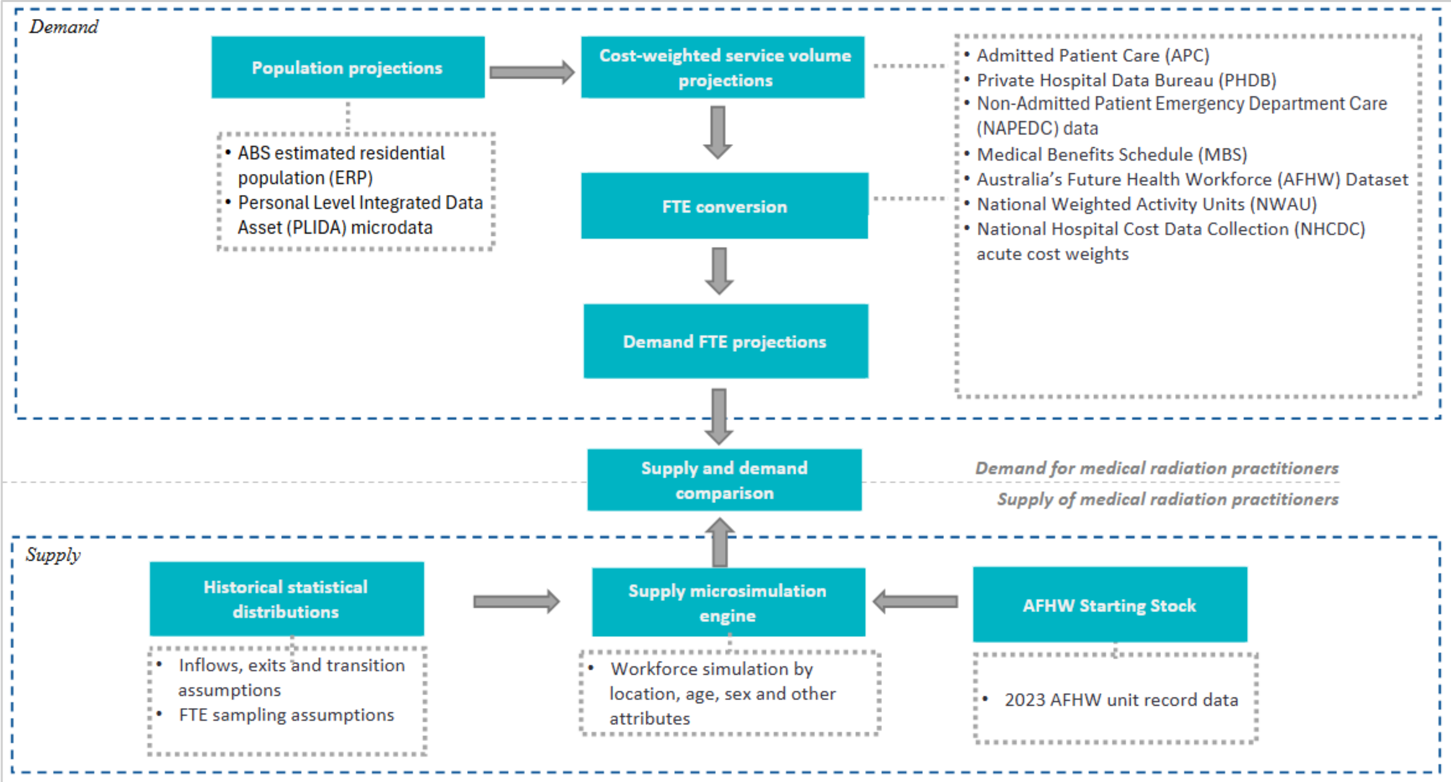
This study models the supply of and demand for MRPs who are currently working clinical hours. For the purposes of the modelling, MRPs are classified into 3 practitioner types based on the division under which they are registered:

1. Diagnostic radiographers
2. Radiation therapists
3. Nuclear medicine technologists.

Modelling has been undertaken at the Statistical Area 4 (SA4) geography (where data availability permitted). However, results will be published at state and territory level, with their aggregation forming the national results.

Figure 5 presents a summary of the process used in modelling the MRP workforce.

Figure 5: Overview of the modelling process



Supply

The supply model uses Australia's Future Health Workforce (AFHW) [7] data on MRPs from 2018 to 2023. To be in scope, MRPs must be:

1. currently registered (excluding non-practising registration) with the Medical Radiation Practice Board of Australia
2. working in medical radiation practice in Australia including those on extended leave and
3. working clinical hours.

The supply model uses the microsimulation approach where attributes such as entries and exits to the workforce and practitioner FTE are modelled distinctly. The supply methodology begins by identifying the current stock of MRPs, analysing their demographic profile and historically observed work patterns. Statistically significant predictors of future workforce

[7] The Australia's Future Health Workforce (AFHW) datasets are created from the National Health Workforce Datasets (NHWDS) for modelling purposes. A sequence of rules (supply criteria) is applied to each NHWDS to determine which practitioners meet the definition of supply for each profession (and sub-groups where applicable). The headcount and workload of these practitioners, along with other variables required for modelling, are included, derived or imputed in the AFHW datasets.

supply (such as age, sex, etc.) are selected, and their historical distributions are measured to allow the development of a microsimulation model.

Demand

Demand is measured in terms of observed utilisation of services which captures expressed (observed) demand for medical radiation services across a variety of care settings. Historical patterns of usage are examined and used to estimate the future demand for MRPs, accounting for differences in service demand across various age groups and geographies.

This approach does not directly capture the population's need for services, particularly for individuals who require medical radiation services but cannot access it due to factors such as affordability or availability.

Demand is projected assuming the supply of MRPs is equal to the demand in the base year, 2023. The following key data sources are used to capture service utilisation:

1. Medical Benefits Schedule (MBS) data
2. AIHW Admitted Patient Care (APC) National Minimum Dataset
3. National Non-Admitted Patient Emergency Department Care Database (NNAPEDCD)
4. National Hospital Cost Data Collection (NHCDC).

Different services require varying workforce effort based on severity of conditions, complexity of procedures, or degree of professional input required. Therefore, services are cost-weighted to adjust for these differences, enabling accurate comparison of resource use by converting them into units of demand activity.

To compare demand to supply and identify the workforce gap, demand activity projections are converted to FTE MRPs by comparing the demand values against the supply FTE from the AFHW dataset. Specifically, historical FTE-to-activity ratios are used to estimate ratios for the forecast period, which are then multiplied by the demand activity projections for the forecast years.

This approach accounts for historical trends in workforce productivity such as the impact of emerging technologies and ensures that these changes are reflected in future workforce estimates.

Demand by practitioner type

Demand for diagnostic radiographers is estimated using data from multiple sources, including the APC, PHDB, NNAPEDCD and MBS datasets. In contrast, demand for radiation therapists and nuclear medicine specialists is derived exclusively from the MBS dataset. This approach reflects the differences in how services are delivered: diagnostic imaging services are high in volume and more broadly distributed across care settings, making them well-represented in multiple datasets. Meanwhile, radiation therapy and nuclear medicine services are predominantly (90-95%) delivered in public outpatient settings and partially subsidised in private facilities,[8] both of which are comprehensively captured by the MBS dataset, providing a reliable national coverage.

However, funding arrangements for radiation therapy and nuclear medicine vary across jurisdictions. In some states and territories, these services are directly funded by hospitals through activity-based funding models. Due to a lack of publicly available data on non-MBS funded services, these hospital-funded activities are excluded from the current modelling. As a result, service demand may be underestimated in jurisdictions where hospital-funded service delivery plays a significant role.

Impact of COVID-19 pandemic

The impact of the COVID-19 pandemic on medical radiation services varied across jurisdictions.[9,10] Consultations highlighted that some jurisdictions experienced a delayed effect on radiation therapy, where reduced cancer screening rates in 2020 led to lower patient treatment volumes in 2021. In other jurisdictions, nuclear medicine services were significantly disrupted during 2020 and 2021 due to shortages of radiopharmaceutical. To ensure more accurate demand estimations, data from COVID-19 affected financial years (2020–21 and 2021–22) were carefully analysed, with jurisdiction-specific exclusions applied based on the nature, extent and timing of the disruptions.

Model limitations

- The model forecasts are based on historical trends in the AFHW dataset and therefore project existing workforce trends into the future. As a result, the modelling does not incorporate potential changes in models of care and technological advancements that may impact the FTE workforce required to deliver radiology services over the projection period.
- The primary source of supply modelling data, the AFHW, is a longitudinal survey of health practitioners. The survey has 3 notable limitations:
    1. All supply FTE/hours are self-reported and therefore subject to measurement errors, response bias, and potential inaccuracies due to memory recall and misinterpretation of questions.
    2. The survey only captures the primary work location of practitioners, and

[8] Australian Institute of Health and Welfare, 2023, Radiotherapy Overview, accessed 4 August 2025. National Cancer Control Indicators, 2017, Radiotherapy treatment activity, accessed 4 August 2025. Australasian Association of Nuclear Medicine Specialists - 2022-23 Pre-Budget Submissions.
[9] Cancer Australia, 2020-2022, The impact of COVID-19 on cancer services, accessed 4 August 2025.
[10] Sreedharan S., Mian M., McArdle D. J. T., Rhodes A. 2021, The impact of the COVID-19 pandemic on diagnostic imaging services in Australia, Journal of Medical Imaging Radiation Oncology, PMC PubMed Central, accessed 4 August 2025.

3. Practitioners without general registration, such as provisional registrants, do not complete the survey and therefore most of their data must be imputed.

- The model estimates future workforce requirements using historical FTE-to-activity ratios, capturing existing productivity trends and the potential influence of emerging technologies such as AI. However, this approach assumes that past patterns will continue and may not fully reflect future shifts in productivity, service delivery models or clinical workflows that could significantly change workforce needs.
- The demand estimates for radiation therapy and nuclear medicine are based on the MBS dataset, which is likely to capture most services delivered across both public and private settings. However, it may not fully account for a small proportion of services provided in non-MBS funded settings. As a result, the actual demand may be slightly underestimated in the current modelling.
- The model does not account for the availability of linear accelerators or associated staffing requirements due to limited data on the number of operational units across states and territories.
- The modelling assumes that Medicare services linked to a Location Specific Practice Number (LSPN)—excluding those classified as professional attendances, diagnostic procedures or therapeutic procedures unrelated to radiation oncology—are delivered by MRPs. However, some of these services may be performed by other professionals, such as sonographers. While this assumption does not impact the estimated demand for MRPs in the baseline year, as projections are based on an equilibrium starting point, the model does not account for potential future changes in workforce composition, such as shifts in the proportion of services delivered by other professionals like sonographers.
- The model does not account for services commissioned by Primary Health Networks (PHNs), the National Disability Insurance Agency and the Department of Veteran Affairs funded health services.
- The model does not capture unmet demand for medical radiation services due to accessibility or affordability challenges, as there is no reliable data on such unmet demand.

Key findings and insights

The main outputs of the MRP model are projections of the number (headcount) and FTE MRPs. The model produces one supply estimate and baseline demand estimates for 3 types of MRPs: diagnostic radiographers, radiation therapists and nuclear medicine technologists.

What is baseline demand?

Baseline demand is the number of MRPs that are needed to meet the current and future demand for radiation services based on observed utilisation and assuming the supply of MRPs is equal to demand in the base year (2023).

National projections

While both the supply of and demand for MRPs are estimated to increase in the future, the workforce is expected to experience a shortage throughout the projection period.

The MRP model projections at national level (Table 6 and Figure 6) indicate that:

- The supply of MRPs is expected to increase from 16,801.5 FTE in 2025 to 21,578.1 FTE by 2038. In terms of headcount, this corresponds to a total of 18,315 MRPs in 2025 and 23,873 in 2038.
- The demand for MRPs is estimated to increase from 17,098.3 FTE in 2025 to 25,681.2 FTE by 2038.
- Throughout the projection period, MRPs are expected to be in shortage.
    - The estimates indicate a current shortfall of 296.8 (1.8%) FTE in 2025, projected to increase to 4,103.1 (19.0%) FTE by 2038.
    - In terms of headcount, the estimates indicate a shortfall of 324 MRPs in 2025, increasing to 4,538 by 2038.

The national supply projections show that:

- The national average FTE per MRP is projected to decline from 0.92 in 2025 to 0.90 by 2038[11]. While the change is minor, it reflects a small reduction in average hours worked over the projection period.
- The total entry rate (headcount) including re-entries is expected to decline throughout the projection period from 9.3% of total supply in 2025 to 8.0% by 2038. This trend is driven by a decline in the new entry rate, which is expected to fall from 6.6% in 2025 to 5.0% by 2038, while the re-entry rate remains relatively stable at around 3.0% throughout the projection period.[12]

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[11] Average FTE per MRP is calculated by dividing the total FTE by the total headcount of MRP in a given year (i.e. Average FTE = Total FTE ÷ Total headcount).

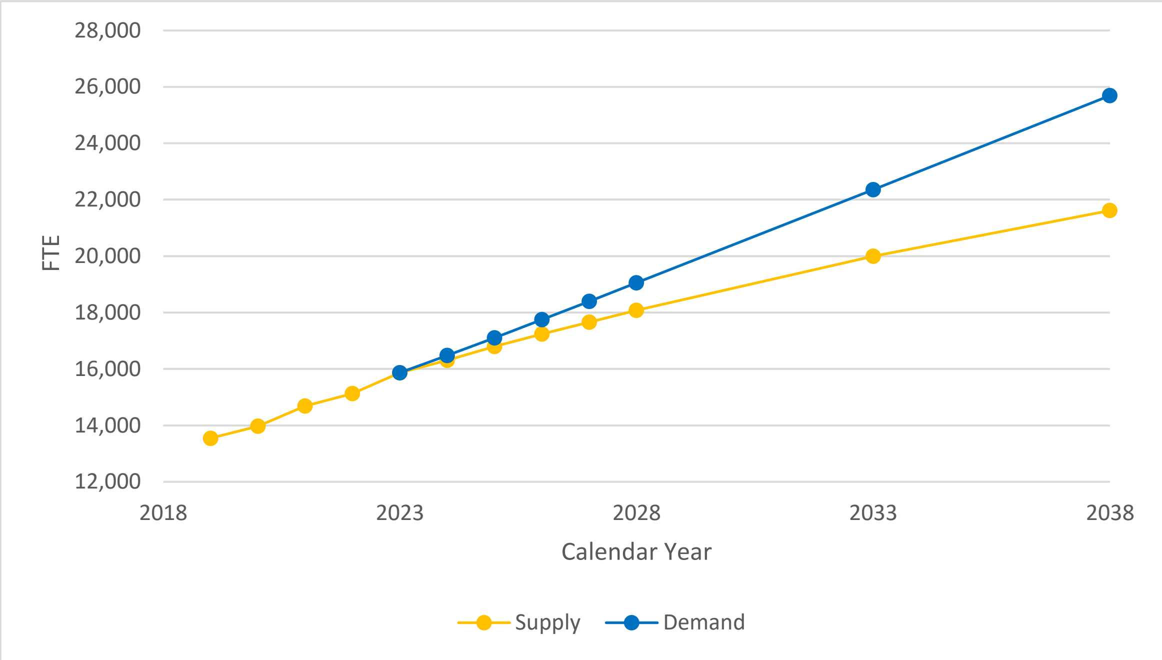
[12] See footnote 4.

- The total exit rate (headcount) including temporary exits is expected to decrease slightly over the projection period from 6.9% of total supply in 2025 to 6.6% by 2038. Exit rates are expected to remain lower than entry rates, consistent with historical trends.
- The number of new entries into the MRP workforce is assumed to remain steady at 1,202 throughout the projection period, comprising of 960 diagnostic radiographers, 165 radiation therapists and 77 nuclear medicine technologists. This assumption is based on the average number of new entries between 2019 and 2023 in the AFHW dataset.

Table 6: National Projections, selected years 2025–38

	2025	2026	2027	2028	2033	2038
Full-time equivalent (FTE)						
Supply	16,801.5	17,240.4	17,658.1	18,079.0	19,971.1	21,578.1
Entries	1,744.6	1,794.4	1,798.8	1,816.4	1,869.8	1,910.2
New Entries	1,321.5	1,327.8	1,320.7	1,328.6	1,331.0	1,319.1
Re-entries	423.1	466.6	478.1	487.8	538.8	591.1
Exits	1,091.9	1,095.2	1,113.4	1,142.8	1,233.4	1,349.8
Permanent Exits	558.2	565.9	570.3	586.4	618.6	685.9
Temporary Exits	533.7	529.3	543.1	556.4	614.8	663.9
Demand	17,098.3	17,742.4	18,394.2	19,053.6	22,350.6	25,681.2
Surplus / Shortfall	- 296.8	- 502.0	- 736.1	- 974.6	- 2,379.5	- 4,103.1
Headcount						
Supply	18,315	18,801	19,292	19,775	21,973	23,873
Entries	1,710	1,753	1,776	1,786	1,853	1,919
New Entries	1,202	1,202	1,202	1,202	1,202	1,202
Re-entries	508	551	574	584	651	717
Exits	1,267	1,284	1,303	1,338	1,451	1,581
Permanent Exits	686	700	702	723	768	848
Temporary Exits	582	584	601	615	683	733
Demand	18,639	19,349	20,097	20,842	24,592	28,411
Surplus / Shortfall	- 324	- 548	- 805	- 1,067	- 2,619	- 4,538

Figure 6: FTE MRPs: National supply versus demand, 2018–38



Age profile of MRPs

- MRPs aged 30-39 are projected to remain the largest segment of the workforce (around 32.0%).
- The proportion of MRPs aged under 30 years is expected to decline from 29.4% in 2025 to 22.6% by 2038. At the same time, the proportion of MRPs aged 40–49 and 50–59 is expected to increase. This trend reflects slower growth in new entrants and the ageing of the existing workforce.
- Throughout the projection period, MRPs aged under 30 will continue contributing the highest average FTE (around 1.04).

Table 7: Age profile of MRPs, 2025 and 2038

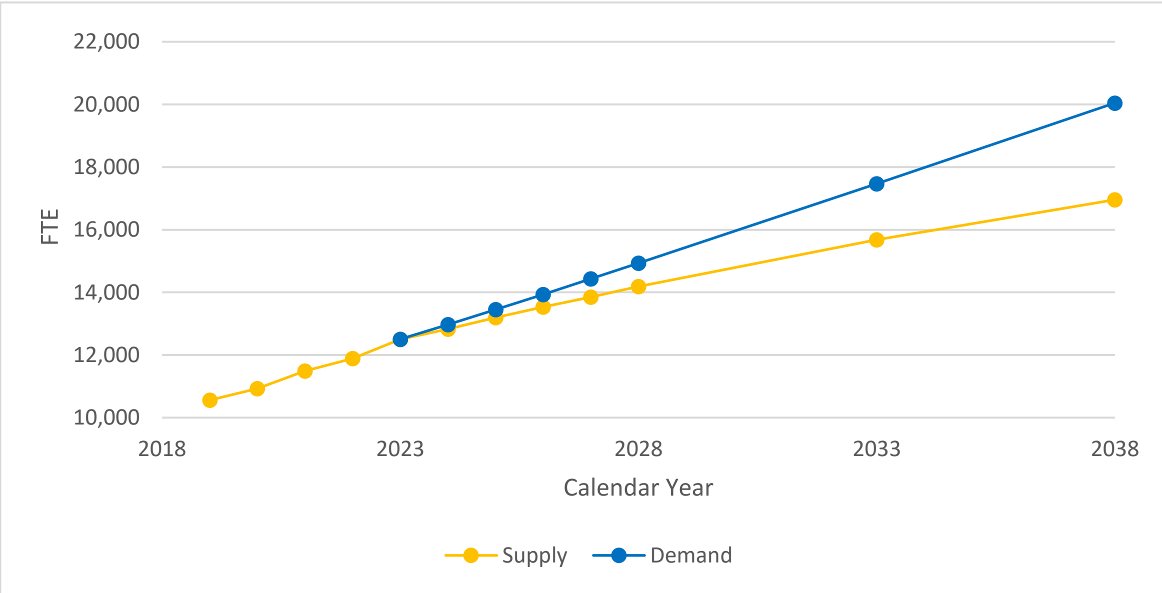
Age groups	2025		2038	
	Headcount	Average FTE	Headcount	Average FTE
Under 30	5,385 (29.4%)	1.03	5,393 (22.6%)	1.04
30–39	5,760 (31.4%)	0.88	7,579 (31.7%)	0.87
40–49	3,826 (20.9%)	0.86	5,857 (24.5%)	0.86
50–59	2,234 (12.2%)	0.88	3,688 (15.4%)	0.88
60 and over	1,109 (6.1%)	0.79	1,356 (5.7%)	0.80
Total	18,315 (100%)	**0.92**	23,873 (100%)	**0.90**

National trends by practitioner type

Diagnostic radiographers

- The supply of diagnostic radiographers is estimated to increase from 13,199.7 FTE in 2025 to 16,957.2 FTE by 2038, see Figure 7. Over the same period, the average FTE per diagnostic radiographer is expected to decrease from 0.92 in 2025 to 0.90 by 2038.
- The demand estimates indicate a current shortfall of 247.0 FTE diagnostic radiographers in 2025, which is projected to increase to 3,089.3 FTE by 2038. In percentage terms, this represents a 1.9% shortage in 2025, rising to 18.2% shortage by 2038.

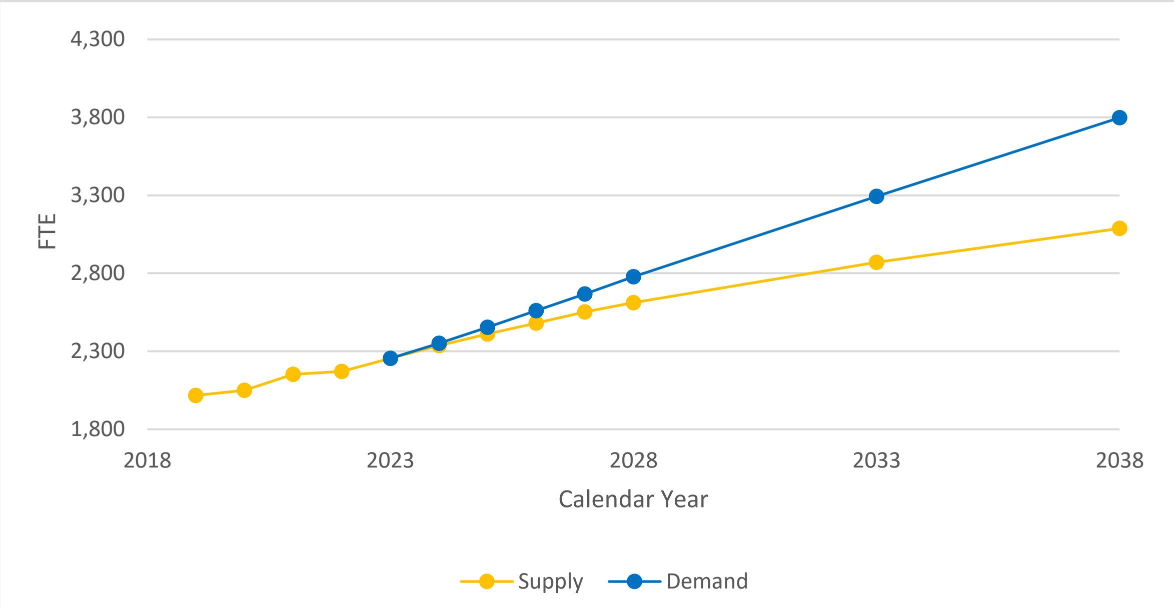
Figure 7: FTE diagnostic radiographer workforce: National supply versus demand, 2018–38



Radiation therapists

- The supply of radiation therapists is estimated to increase from 2,411.8 FTE in 2025 to 3,087.9 FTE by 2038, see Figure 8. Over the same period, the average FTE per radiation therapist is expected to remain stable around 0.91.
- The demand estimates indicate a current shortfall of 42.3 FTE radiation therapist in 2025, which is projected to increase to 710.1 FTE by 2038. In percentage terms, this represents a 1.8% shortage in 2025, rising to 23.0% shortage by 2038.

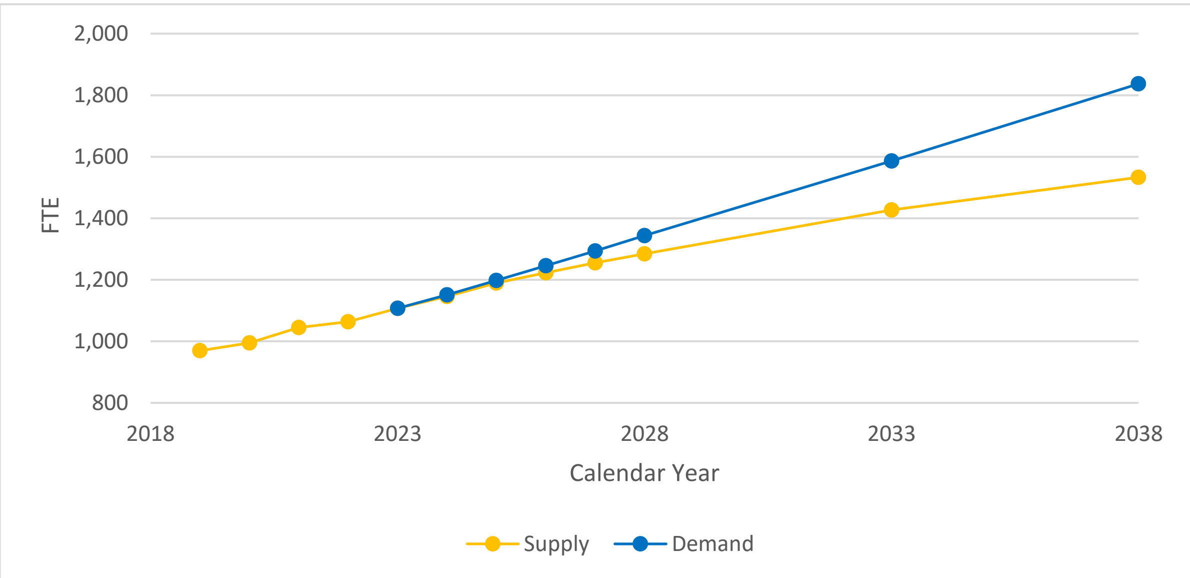
Figure 8: FTE radiation therapy workforce: National supply versus demand, 2018–38



Nuclear medicine technologists

- The supply of nuclear medicine technologists is estimated to increase from 1,190.1 FTE in 2025 to 1,533.0 FTE by 2038, see Figure 9. Over the same period, the average FTE per nuclear medicine technologist is expected to remain stable around 0.95.
- The demand estimates indicate a current shortfall of 7.4 FTE nuclear medicine technologists in 2025, which is projected to increase to 303.7 FTE by 2038. In percentage terms, this represents a slight shortage of 0.6% in 2025, rising to 19.8% shortage by 2038.

Figure 9: FTE diagnostic radiographer workforce: National supply versus demand, 2018–38



State and territory projections

Throughout the projection period (2024 to 2038), all states and territories are expected to experience an overall shortage of MRPs.

Table 8 presents a summary of state and territory projections for the overall MRP workforce, as well as projections of each of the 3 practitioner types by state and territory.

Table 8: Summary of State–level projections- Projected under/oversupply of FTE MRPs and % under/oversupply, 2025, 2033 & 2038

State/ Territory	Total workforce			Diagnostic Radiographer			Radiation Therapist			Nuclear Medicine Technologist		
	2025	2033	2038	2025	2033	2038	2025	2033	2038	2025	2033	2038
NSW	-24.8 (-0.5%)	-561.1 (-8.5%)	-1,093.4 (-15.4%)	-37.9 (-0.9%)	-467.0 (-8.9%)	-882.1 (-15.6%)	6.3 (0.9%)	-86.5 (-10.0%)	-170.0 (-18.3%)	6.8 (1.7%)	-7.6 (-1.6%)	-41.3 (-8.2%)
VIC	-109.9 (-2.7%)	-778.5 (-16.2%)	-1,355.3 (-26.4%)	-103.8 (-3.2%)	-641.8 (-17.1%)	-1,089.1 (-27.0%)	3.7 (0.6%)	-48.3 (-6.8%)	-108.9 (-14.4%)	-9.7 (-3.2%)	-88.3 (-25.9%)	-157.2 (-44.2%)
QLD	-83.2 (-2.3%)	-523.9 (-12.3%)	-850.4 (-18.4%)	-56.9 (-2.0%)	-368.8 (-11.2%)	-596.2 (-16.8%)	-24.4 (-4.2%)	-136.6 (-19.3%)	-220.2 (-28.6%)	-1.9 (-0.8%)	-18.6 (-6.6%)	-33.9 (-10.7%)
SA	-30.8 (-2.4%)	-160.6 (-10.8%)	-266.7 (-16.7%)	-25.9 (-2.5%)	-119.9 (-10.1%)	-190.9 (-15.0%)	-5.0 (-3.3%)	-31.2 (-17.0%)	-53.9 (-28.1%)	0.2 (0.2%)	-9.5 (-7.5%)	-21.9 (-16.6%)
WA	-20.3 (-1.3%)	-204.9 (-10.5%)	-310.7 (-14.3%)	-8.9 (-0.7%)	-116.6 (-7.5%)	-191.4 (-11.1%)	-14.0 (-6.5%)	-81.3 (-31.5%)	-112.3 (-39.8%)	2.7 (2.8%)	-6.9 (-5.1%)	-7.0 (-4.4%)
TAS	-12.3 (-3.7%)	-37.6 (-9.8%)	-47.1 (-11.3%)	-4.0 (-1.7%)	-6.1 (-2.2%)	-10.4 (-3.5%)	-5.6 (-7.4%)	-22.4 (-25.7%)	-25.8 (-26.5%)	-2.7 (-12.9%)	-9.1 (-39.6%)	-10.8 (-41.4%)
ACT	-11.3 (-3.8%)	-75.6 (-21.4%)	-127.9 (-34.7%)	-8.4 (-3.7%)	-51.9 (-18.9%)	-96.2 (-33.4%)	-3.7 (-7.9%)	-14.7 (-32.8%)	-13.0 (-27.7%)	0.8 (2.6%)	-8.9 (-26.0%)	-18.7 (-55.9%)
NT	-4.3 (-3.4%)	-37.3 (-26.1%)	-51.7 (-33.0%)	-1.2 (-1.1%)	-24.4 (-19.8%)	-32.8 (-24.2%)	0.4 (4.1%)	-2.8 (-21.5%)	-6.0 (-43.6%)	-3.5 (-59.9%)	-10.1 (-157.9%)	-12.8 (-187.0%)
National	**-296.8 (-1.8%)**	**-2,379.5 (-11.9%)**	**-4,103.1 (-19.0%)**	**-247.0 (-1.9%)**	**-1,796.5 (-11.5%)**	**-3,089.3 (-18.2%)**	**-42.3 (-1.8%)**	**-423.8 (-14.8%)**	**-710.1 (-23.0%)**	**-7.4 (-0.6%)**	**-159.2 (-11.2%)**	**-303.7 (-19.8%)**

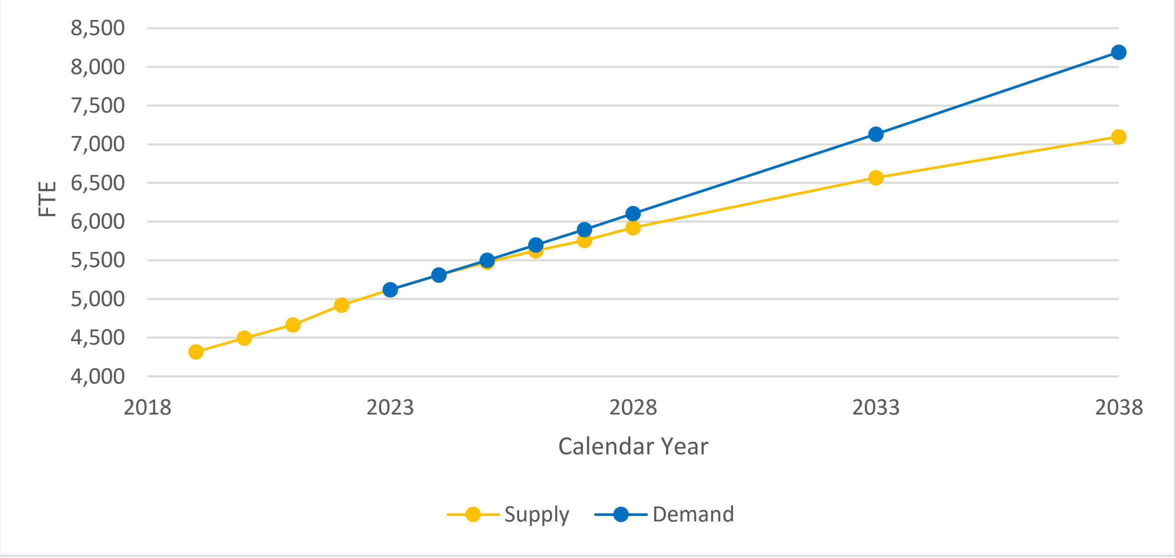
New South Wales (NSW)

The supply of MRPs in NSW is expected to increase from 5,476.8 FTE in 2025 to 7,098.1 FTE by 2038, see Figure 10. Despite this increase, demand estimates indicate that NSW will experience a shortfall, rising from 24.8 FTE in 2025, to 1,093.4 by 2038.

Projected workforce balance for NSW by practitioner type:

- **Diagnostic radiographer** - projected shortfall of 37.9 FTE in 2025, increasing substantially to 882.1 FTE by 2038.
- **Radiation therapist** - projected surplus of 6.3 FTE in 2025, shifting to a shortfall of 170.0 FTE by 2038.
- **Nuclear medicine technologist** - projected surplus of 6.8 FTE in 2025, shifting to a shortfall of 41.3 by 2038.

Figure 10: FTE MRPs: NSW supply versus demand, 2018–38



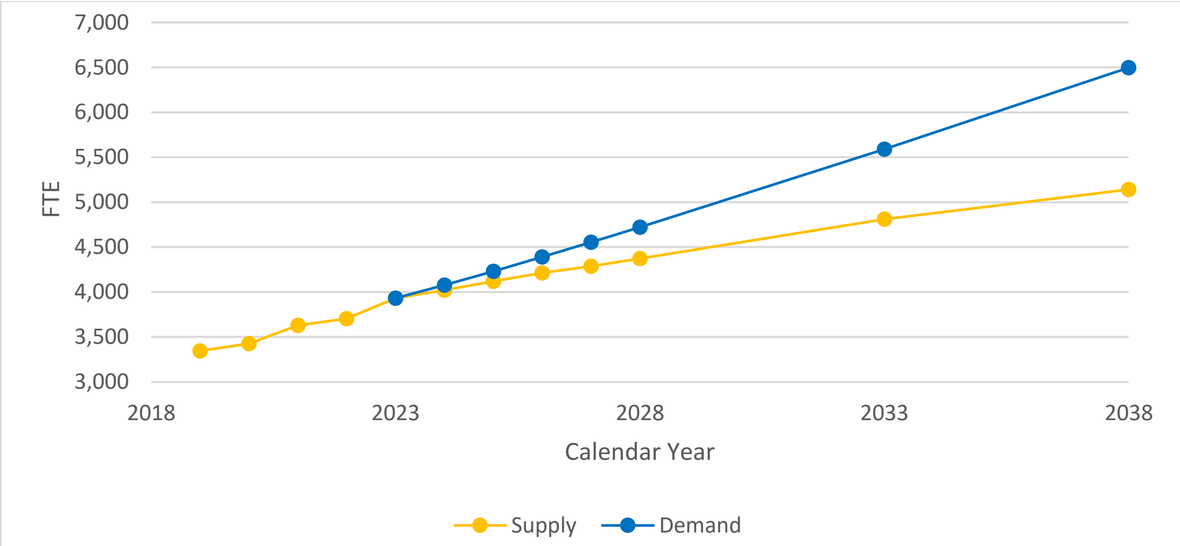
Victoria (VIC)

The supply of MRPs in VIC is expected to increase from 4,119.7 FTE in 2025 to 5,141.6 FTE by 2038, see Figure 11. Despite this increase, demand estimates indicate that VIC will continue to experience a shortfall, rising from 109.9 FTE in 2025 to 1,355.3 FTE by 2038.

Projected workforce balance for VIC by practitioner type:

- **Diagnostic radiographer** - projected shortfall of 103.8 FTE in 2025, increasing significantly to 1,089.1 FTE by 2038.
- **Radiation therapist** - projected surplus of 3.7 FTE in 2025, shifting to a shortfall of 108.9 FTE by 2038.
- **Nuclear medicine technologist** - projected shortfall of 9.7 FTE in 2025, increasing to 157.2 FTE by 2038.

Figure 11: FTE MRPs: VIC supply versus demand, 2018–38



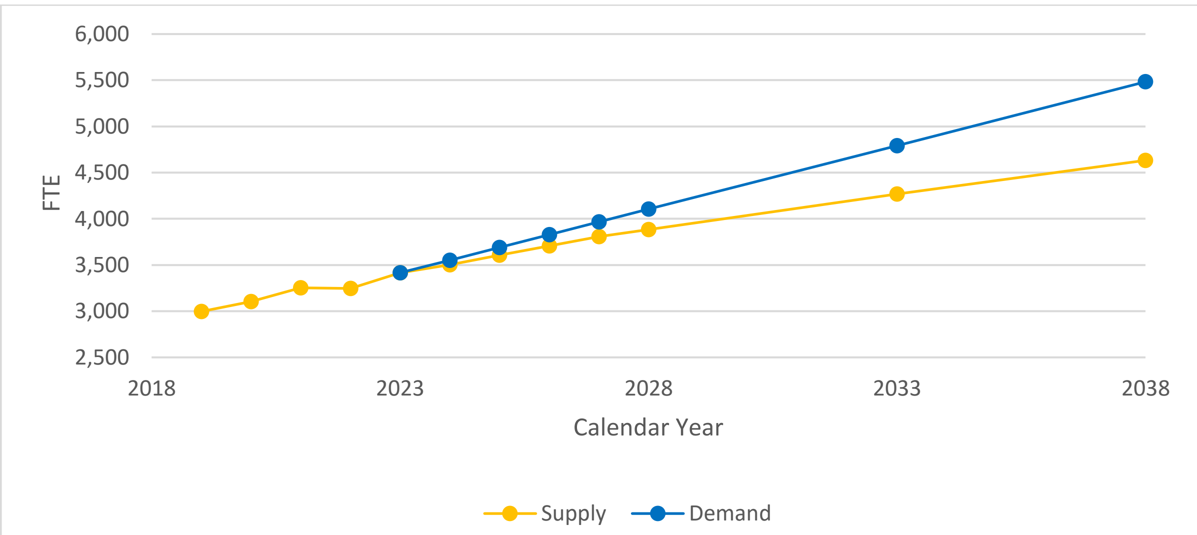
Queensland (QLD)

The supply of MRPs in QLD is expected to increase from 3,604.7 FTE in 2025 to 4,632.7 FTE in 2038, see Figure 12. Despite this increase, demand estimates indicate that QLD will continue to face a shortfall, rising from 83.2 FTE in 2025 to 850.4 FTE by 2038.

Projected workforce balance for QLD by practitioner type:

- **Diagnostic radiographer** - projected shortfall of 56.9 FTE in 2025, increasing to 596.2 FTE by 2038.
- **Radiation therapist** - projected shortfall of 24.4 FTE in 2025, increasing to 220.2 FTE by 2038.
- **Nuclear medicine technologist** - projected small shortfall of 1.9 FTE in 2025, increasing to 33.9 FTE by 2038.

Figure 12: FTE MRPs: QLD supply versus demand, 2018–38



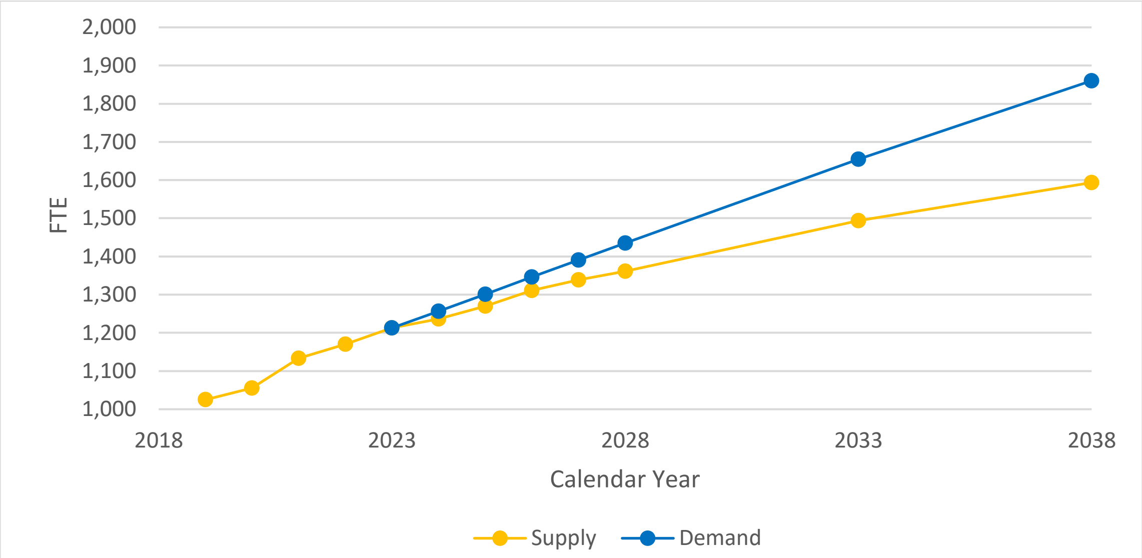
South Australia (SA)

The supply of MRPs in SA is expected to increase from 1,270.2 FTE in 2025 to 1,593.5 FTE by 2038, see Figure 14. Despite this increase, demand estimates indicate that SA will face a shortfall, rising from 30.8 FTE in 2025 to 266.7 FTE by 2038.

Projected workforce balance for SA by practitioner type:

- **Diagnostic radiographer** - projected shortfall of 25.9 FTE in 2025, increasing to 190.9 FTE by 2038.
- **Radiation therapist** - projected shortfall of 5.0 FTE in 2025, increasing to 53.9 FTE by 2038.
- **Nuclear medicine technologist** - projected slight surplus of 0.2 FTE in 2025, shifting to a shortfall of 21.9 FTE by 2038.

Figure 14: FTE MRPs: SA supply versus demand, 2018–38



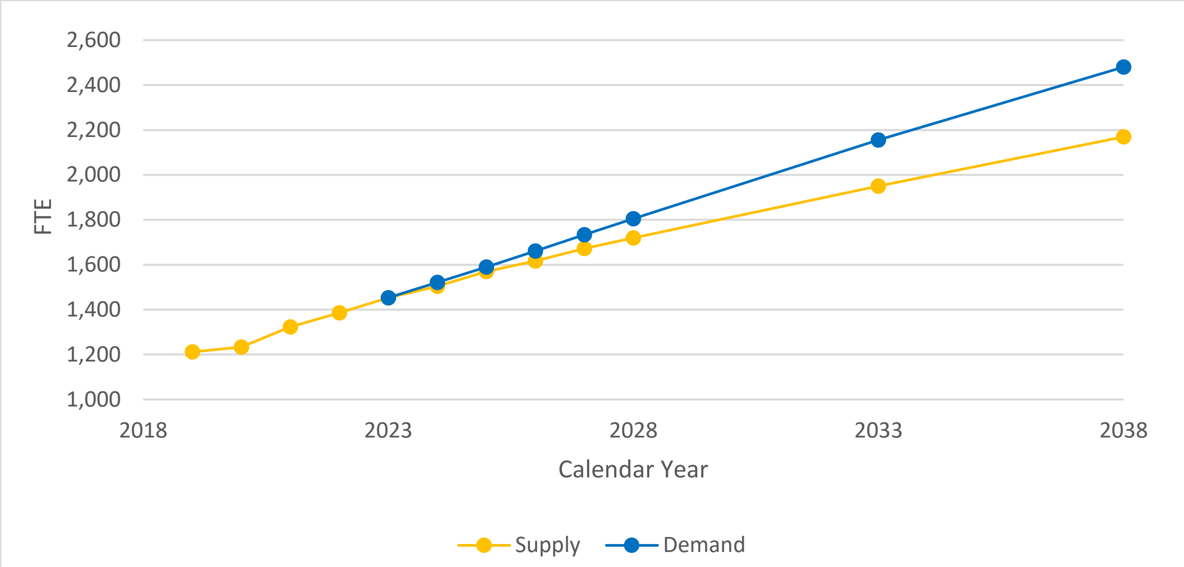
Western Australia (WA)

The supply of MRPs in WA is expected to increase from 1,569.6 FTE in 2025 to 2,169.3 FTE in 2038, see Figure 13. Despite this increase, demand estimates indicate that WA will experience a shortfall, rising from 20.3 FTE in 2025 to 310.7 FTE by 2038.

Projected workforce balance for WA by practitioner type:

- **Diagnostic radiographer** - projected shortfall of 8.9 FTE in 2025, increasing to 191.4 FTE by 2038.
- **Radiation therapist** - projected shortfall of 14.0 FTE in 2025, increasing to 112.3 FTE by 2038.
- **Nuclear medicine technologist** - projected small surplus of 2.7 FTE in 2025, shifting to a shortfall of 7.0 FTE by 2038.

Figure 13: FTE MRPs: WA supply versus demand, 2018–38



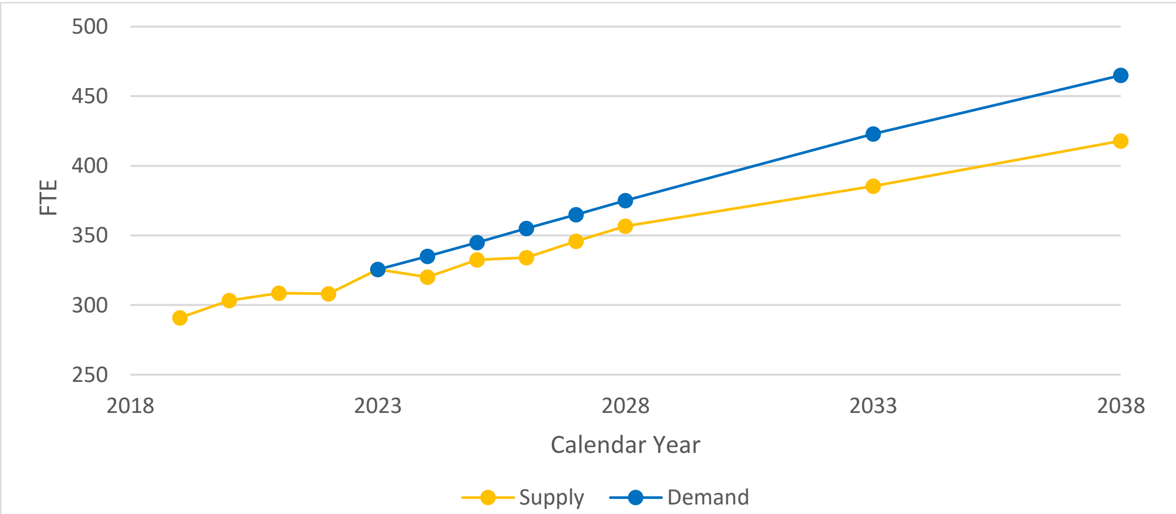
Tasmania (TAS)

The supply of MRPs in TAS is expected to increase from 332.6 FTE in 2025 to 417.9 FTE by 2038, see Figure 15. Despite this increase, demand estimates indicate that TAS will experience a shortfall, rising from 12.3 FTE in 2025 to 47.1 FTE by 2038.

Projected workforce balance for TAS by practitioner type:

- **Diagnostic radiographer** - projected shortfall of 4.0 FTE in 2025, increasing to 10.4 FTE by 2038.
- **Radiation therapist** - projected shortfall of 5.6 FTE in 2025, increasing to 25.8 FTE by 2038.
- **Nuclear medicine technologist** - projected shortfall of 2.7 FTE in 2025, shifting to a surplus of 10.8 FTE by 2038.

Figure 15: FTE MRPs: TAS supply versus demand, 2018–38



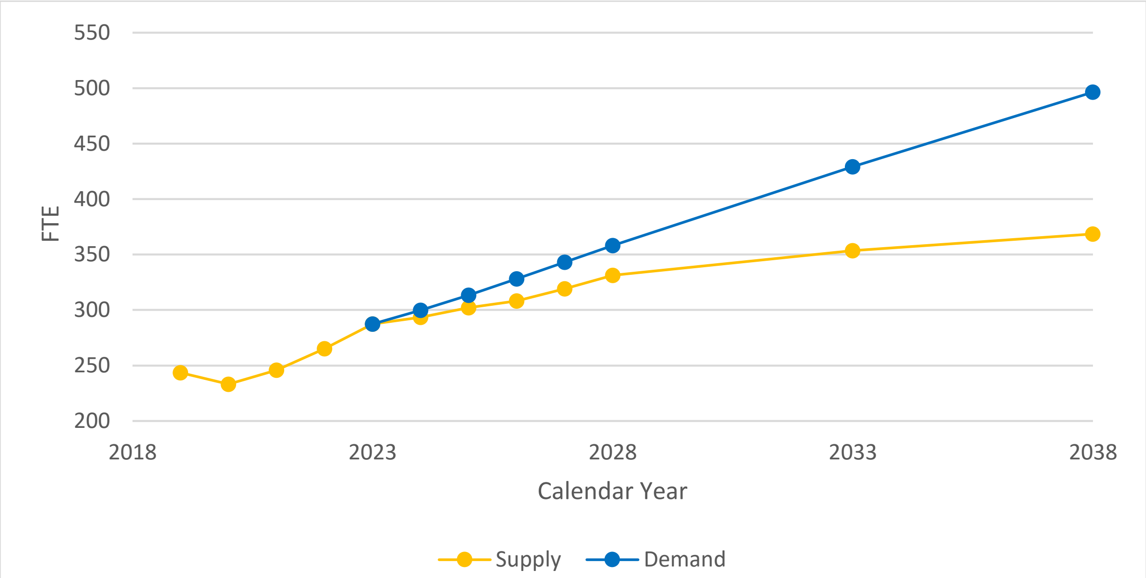
Australian Capital Territory (ACT)

The supply of MRPs in the ACT is expected to increase from 302.2 FTE in 2025 to 368.6 FTE by 2038, see Figure 16. Despite this increase, demand estimates indicate that the ACT will face a shortfall, rising of 11.3 FTE in 2025 to 127.9 FTE by 2038.

Projected workforce balance for the ACT by practitioner type:

- **Diagnostic radiographer -** projected shortfall of 8.4 FTE in 2025, increasing to 96.2 FTE by 2038.
- **Radiation therapist -** projected shortfall of 3.7 FTE in 2025, increasing to 13.0 FTE by 2038.
- **Nuclear medicine technologist -** projected slight surplus of 0.8 FTE in 2025, shifting to a shortfall of 18.7 FTE by 2038.

Figure 16: FTE MRPs: ACT supply versus demand, 2018–38



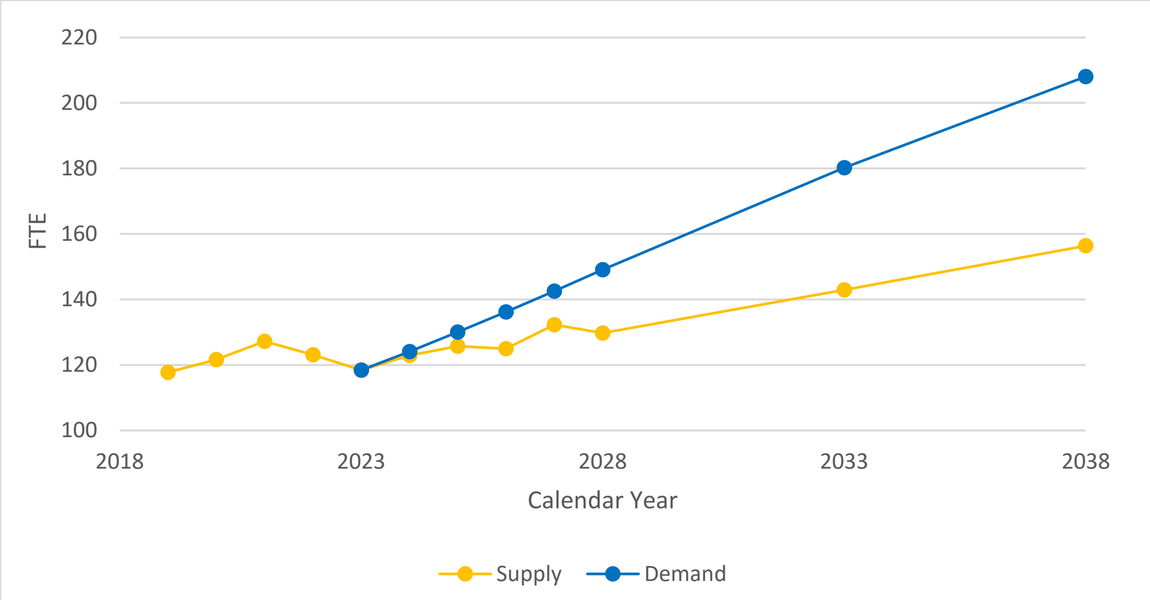
Northern Territory (NT)

The supply of MRPs in the NT is expected to increase from 125.7 FTE in 2025 to 156.4 FTE by 2038, see Figure 17. Despite this slight increase, demand estimates indicate that the NT will experience a shortfall, rising from 4.3 FTE in 2025 to 51.7 FTE by 2038.

Projected workforce balance for the NT by practitioner type:

- **Diagnostic radiographer -** projected shortfall of 1.2 FTE in 2025, increasing to 32.8 FTE by 2038.
- **Radiation therapist -** projected small surplus of 0.4 FTE in 2025, shifting to a shortfall of 6.0 FTE by 2038.
- **Nuclear medicine technologist -** projected shortfall of 3.5 FTE in 2025, increasing to 12.8 FTE by 2038.

Figure 17: FTE radiologists: NT supply versus demand, 2018–48



What do the results indicate?

The MRP model suggests a workforce shortage throughout the projection period (2024–38), with demand for medical radiation services in the Australian community projected to exceed supply.

The study forecasts a widening gap between supply and demand for MRPs in Australia, with workforce shortages expected to persist over the next 15 years. Although the overall supply of MRP workforce is gradually increasing, this growth is unlikely to keep pace with the growing demand for medical radiation services.

In FTE terms, results indicate an overall shortfall of MRPs of 1.8% in 2025, which is projected to rise to 19.0% by 2038. When broken down by practitioner type:

- Diagnostic radiographers are facing a shortage of 1.9% in 2025, expected to grow 18.2% by 2038.
- Radiation therapists are currently short by 1.8% in 2025, with the gap widening significantly to 23.0% by 2038.
- Nuclear medicine technologists have a current shortfall of 0.6%, expected to reach 19.8% by 2038.

The increasing demand for medical radiation services is being driven by population growth and a rising incidence of cancer.[13] Technological advancements are also expected to shape both demand for medical radiation services and workforce productivity. Innovations such as the integration of AI are enhancing diagnostic accuracy and treatment precision, leading to earlier detection and more efficient treatment planning.[14,15] However, the full impact of these emerging technologies remains uncertain and is challenging to reflect accurately in the current workforce modelling.

Emerging treatments such as hypofractionation[16] are also reshaping the demand for medical radiation services. By delivering higher doses of radiation over fewer sessions, hypofractionation shortens treatment courses without compromising clinical outcomes. This reduction in treatment sessions per patient has the potential to increase overall workforce capacity, enabling more patients to be treated within the same timeframe.

Although, the current model incorporates historical productivity trends, it assumes these patterns will continue in the future. Consequently, it may not fully capture the impact of

[13] Australian Institute of Health and Welfare, 2024, Cancer data in Australia, Overview of cancer in Australia, accessed 15 July 2025.
[14] O'Shaughnessey J. & Collin I. M. 2022, Radiation therapist perceptions on how artificial intelligence may affect their role and practice, Journal of Medical Radiation Sciences – Wiley Online, accessed 15 July 2025.
[15] Medical Radiation Practice Board of Australia, 2024,Medical Radiation Practice Board of Australia- Statement on Artificial Intelligence (AI), accessed 15 July 2025.
[16] A radiation therapy technique where higher doses of radiation are delivered per session (or fraction) over fewer treatment sessions. It is often used for certain cancers, such as breast or prostate cancer, and aims to achieve similar or better outcomes compared to traditional approaches, while reducing the number of visits and overall treatment time for patients.

emerging changes in service delivery models, shifts in clinical workflows or productivity gains driven by innovations like hypofractionation. The full implications of these evolving technologies and treatments remain uncertain and are difficult to accurately model within the existing framework.

MRPs aged 30-39 are projected to remain the largest segment of the workforce, consistently accounting for around 33.0% throughout the projection period. Meanwhile, the proportion of practitioners under 30 is expected to decline from 29.4% in 2025 to 22.6% by 2038, reflecting slower growth in new entrants and the natural ageing of the existing workforce. In contrast, the proportion of MRPs aged 40–49 and 50–59 is anticipated to increase. Despite their declining representation, MRPs under 30 are expected to continue contributing the highest average FTE, at approximately 1.04.

Sustaining medical radiation services across Australia over the long term will depend on having a consistent supply of skilled professionals. As the sector continues to evolve, the considered integration of technological innovations offers opportunities to ease workforce pressures and enhance service delivery.

Consultations

During development of the MRP model, the department consulted with the following stakeholders:

- Australian Society of Medical Imaging and Radiation Therapy
- Australian Sonographers Accreditation Registry
- Australasian Sonographers Association
- State and Territory workforce planners.

Next steps

The medical radiation practice model will be updated every two years with the latest available data across all data sources.

We welcome stakeholder feedback to support the continuous improvement of the model, enhancing its value as a tool for effective health program delivery and workforce planning.

If you require further information regarding the medical radiation practice model or the results as published contact us at healthworkforcedata@health.gov.au.

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All information in this publication is correct as at August 2026