The shortage of medical oncologists: the Australian Medical Oncologist Workforce Study

Concerns are increasing in Australia and internationally that the supply of medical oncologists (MOs) is insufficient to meet the rising demand.1-5 The only study of the medical and haematological oncology workforce in Australia was published in 2001.6 This study found that there were 180 MOs in active practice in Australia (0.9 per 100,000 population), and an estimated shortfall of at least 40 medical and haematological oncologists.

The best estimate of the number of MOs in Australia in 2009 was 311, based on the membership of the Medical Oncology Group of Australia (MOGA), the peak representative body for MOs in Australia. This equates to 1.4 MOs per 100,000 population. Despite the increase since 2001, this figure is still well below comparable international figures, such as the 3.5 MOs per 100,000 population reported in the United States in 2005.7

In response to consumer concerns about the medical oncology workforce shortage, the Australian Medical Oncologist Workforce Study was initiated by MOGA in 2009. The purpose of this cross-sectional study was to evaluate the current and future capacity of the MO workforce by estimating the supply, demand and shortfall of MOs in Australia in 2009 and 2014.

Methods

Study population

Lead clinicians, directors, or solo practitioners (“lead clinicians”) of all public and private adult medical oncology practices in Australia were invited to complete a self-administered survey. Lead clinicians could represent more than one practice. Practices and lead clinicians were identified using the MOGA membership database, consumer directories and databases of state and federal departments of health. Institutional human research ethics committee approval of the study was obtained from the University of Wollongong.

Abstract

Objective: To determine current and projected supply, demand and shortfall of medical oncologists (MOs) and the Australian chemotherapy utilisation rate.


Instrument: Electronic or paper self-administered questionnaire.

Main outcome measures: The 2009 and projected (2014) supply, demand and shortfall of full-time equivalent (FTE) MOs, and the chemotherapy utilisation rate.

Results: 476 medical oncology positions comprising 234 FTE MOs were identified. Of the 150 medical oncology practices, 117 (78%) were in metropolitan areas with 23 (16%) in rural areas. The average number of new patients seen per FTE MO was 270 patients (ranging by state from 191 to 343). The demand for FTE MOs was estimated at 326 to 391 in 2009 and 361 to 432 in 2014. The shortfall of FTE MOs was estimated at 92 to 157 in 2009 and 84 to 156 in 2014. The chemotherapy utilisation rate was 19%.

Conclusions: The current shortage of MOs is expected to persist in the future. National strategies are needed to increase the capacity of the medical oncology workforce and the chemotherapy utilisation rate.
on previous modelling.12 Optimal workloads of 150 and 180 new patients seen per FTE MO per year were based on Canadian and Australian benchmarks.1,13

**Statistical analysis**

Descriptive statistics were used to summarise the responses to the survey at state, territory and national levels. Calculations excluded practices that reported missing data for the relevant item. The chemotherapy utilisation rate was calculated as the ratio of the number of new patients reported in the survey to be receiving chemotherapy, and the new cases of cancer reported to state and territory cancer registries.

The current MO supply was calculated as total FTE MOs for 2009. The projected supply was calculated as current supply + (average number registered advanced trainees/year [an anticipated FTE/qualified specialist of 0.5] × 5 years) – (FTE number expected to retire in the next 5 years).

The demand for FTE MOs was calculated as new cases of cancer reported to cancer registries × optimal chemotherapy utilisation rate ÷ benchmarks of 150 and 180 new patients seen/FTE MO/year. The shortfall was calculated as supply − demand.

Statistical analysis was performed using Microsoft Office Excel 97–2003 (Microsoft, Redmond, Wash, USA).

**Results**

**Response rate**

We identified 116 eligible lead clinicians in 150 Australian adult medical oncology practices. Ninety-four clinicians completed the survey, eight declined to participate and 14 did not respond (response rate, 81%). Data were provided about the number of medical oncology positions in 102 of 150 centres (68%), and the number of FTE MOs in 77 of 150 centres (51%).

We estimated that missing data represented no more than 20 (<10%) unreported FTE MOs because missing data predominantly related to small rural and/or private practices without a dedicated oncologist, three medium metropolitan practices and one regional practice. Data were provided about the number of new patients with cancer seen in 63/150 centres (42%) (representing 181/234 [77%] reported FTE MOs), and about the number of new patients who received at least one course of chemotherapy seen in 50/150 (33%) centres (representing 137/234 [59%] reported FTE MOs). From these data, we estimated...
that an additional 25% of new patients with cancer were seen and an additional 40% of unreported new patients received at least one course of chemotherapy.

**Nature of the practices**
Most practices surveyed were in metropolitan areas, a minority were private practices and there were few solo practitioners. Sixty-five MOs (14%) attended rural outreach clinics (Box 1).

**Current supply**
Of 476 medical oncology positions, 49% comprised FTE MOs (Box 2). Three-quarters of the FTE MOs were found in the three most populous states or territories (New South Wales, Victoria and Queensland). The national average FTE per medical oncology position was 0.5, and almost one-third of the medical oncology positions (29%) were filled by women. There were more medical oncology positions in public than private practices. Few medical oncology positions were located in rural centres.

**Workload**
49,073 new patients with cancer were reported to have been seen in 2008, 43% of the 115,126 estimated new cases of cancer.\(^{10}\) An average of 270 new patients were reported to have been seen per FTE MO. 21,954 new patients seen in 2008 (45%) received at least one course of chemotherapy, with an average of 160 (ranging from 94 in South Australia to 198 in NSW) new patients receiving chemotherapy per FTE MO. The national chemotherapy utilisation rate was 19%.

**Future supply**
There were 85 medical oncology advanced training positions identified, of which 74 (87%) were filled. There were 91 medical oncology advanced trainees registered with the RACP in 2009. The number of first-year trainees increased from 11 to 39 between 2005 and 2009. Numbers of registered trainees exceed training positions identified because some trainees work in positions outside medical oncology (eg, palliative care). There were 32 OTPs nationally, with the highest number in Queensland. Thirty-two FTE MOs (14%) were expected to retire between 2009 and 2014 (about six FTE MOs per year).

**Current and projected demand**
For an optimal workload of 150 new patients/FTE MO/year, the demand for FTE MOs was 391 in 2009 and 432 in 2014 (Box 3). For an optimal workload of 180 new patients, the demand was 326 in 2009 and 361 in 2014. The highest demand (over optimal workload) for FTE MOs was in NSW.

**Current and projected shortfall of medical oncologists**
For the current supply of 234 FTE MOs, the shortfall of FTE MOs (over optimal workload) was 92 to 157 in 2009, and 84 to 156 in 2014 (Box 3). The highest absolute shortfalls were in NSW and Queensland (Box 4).

**Discussion**
We identified a current shortage of MOs in Australia, expected to persist in the future. A conservative estimate of the current supply, demand and shortfall of MOs was 234, 326 and 92 FTE respectively (at a workload of 150 new patients/FTE MO/year). Shortfalls of MOs were found in all states and territories and in metropolitan and rural centres.

MOs in Australia in 2008 had a high clinical workload compared with international benchmarks. The average number of new patients per FTE MO of 270 is well above Canadian recommendations of 160 to 175\(^1\) and the suggested Australian benchmark of 150 new patients per year.\(^{13}\) Reduction of this clinical workload requires training more than double the estimated shortage of FTE MOs, given that the average FTE per MO was 0.5 (Box 2). The increasing diversification of MOs into non-clinical roles will only increase the demand on clinical responsibilities should the shortage not be addressed.

The national chemotherapy utilisation rate was surprisingly low, and well below the evidence-based Australian standard of 51%.\(^{12}\) This is of concern because it implies that some patients who may benefit from chemotherapy are not receiving it. Possible explanations for a low chemotherapy utilisation rate include suboptimal referral rates of patients with cancer, patients referred with advanced rather than early stage cancer, and low prescribing rates of chemotherapy to new patients with cancer. We suspect that we underestimated chemotherapy utilisation rate, because only one-third of centres (representing about 60% of the total national MO workload) reported the number of new patients who received chemotherapy. However, even correcting for the underestimate, it is unlikely that chemotherapy utilisation in Australia approximates expected standards.

The number of trainees was greater than the number MOs expected to retire. This suggests that the supply of MOs should be able to meet the increased demand over the next 5 years, assuming full integration of the trainees into the medical oncology workforce. However, allowing for part-time work practices, overseas...
placements and maternity and other leave, the increasing supply of trainees does not allow for a substantial increase in the capacity of the medical oncology workforce to address the current shortage. Supplementation of the workforce by OTPs is welcome, but is limited by their uncertain supply.

Although not directly comparable, our findings are similar to the results of the recent study of the oncology workforce in the US,7 and studies of the medical workforce in other oncology specialties such as radiation oncology14 and palliative care.15 The US study found that demand for MOs is expected to rise by 48% between 2005 and 2020, but supply will only rise 14%, translating into a shortfall of 2550 to 4080 oncologists (about one-quarter to one-third of the 2005 supply).

Our study has several limitations. The response rate of 81% was acceptable, but may not have been high enough to generalise the results to all MOs and practices in Australia. Lead clinicians, rather than individual MOs, were surveyed to maximise the response rate, but this was at the cost of detailed knowledge about workplace patterns of individual MOs. Only the clinical workload of MOs relating to chemotherapy was included, so the results may have underestimated the true workload of MOs in Australia, which also includes other systemic therapies such as hormonal therapy. Our study highlighted the lack of basic data collection at some oncology practices. Some responses were estimated rather than counted, and many centres were unable to provide any data about workload. This reduced the accuracy of the results and is likely to have underestimated the workload relating to new patients.

Despite these limitations, we provide a snapshot of the current medical oncology workforce in Australia, and an estimate of the current and future workforce shortages. Addressing the shortage needs a multilevel approach aimed at increasing the supply of MOs by increasing recruitment, training and participation rates, improving clinical practice efficiency, and the introduction of innovative methods of service delivery through involvement of other health professionals and use of models of shared care.

Tailored national strategies will be necessary to ensure an adequate medical oncology workforce in the future, and ongoing monitoring will be needed to guide and promote the strategies.

Acknowledgements: We thank the Medical Oncology Group of Australia for support.

Competing interests: No relevant disclosures.

Received 28 Mar 2011, accepted 5 Sep 2011.


