

HealthWorkforce
AUSTRALIA

The effects of medical graduate expansion in Australia

Final Report, March 2012

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The University of Melbourne



An Australian Government Initiative

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Foreword

Health Workforce Australia (HWA) was established to address the challenges of providing a skilled, flexible and innovative health workforce that meets the needs of the Australian community. Our goal is to deliver research, and programs and to ensure that governments and health sector leaders are informed, engaged and supported in equipping Australia's health workforce to meet current and future challenges. HWA is a partner in the National Health Workforce Planning and Research Collaboration (the Collaboration); a consortium originally also comprising the Australian Health Workforce Institute and PricewaterhouseCoopers. HWA assumed a role in the Collaboration when the former National Health Workforce Taskforce ceased operations and was subsumed by HWA. This report presents the results of one of the studies conducted in the third year of the Collaboration's three year program.

HWA's remit include research and workforce planning which will support the maintenance of a sustainable health workforce. Health Workforce 2025 (HW 2025) is a major flagship program of HWA, and draws on simulation modelling and stakeholder consultation to produce national supply and demand projections for various health professions based on a range of alternative planning scenarios. HW 2025 includes a training pipeline, which uses modelling to look at how many trainees are required in university, post graduate and specialist training positions each year to achieve a work force which can meet the demand for services in 2025.

The Effects of Medical Graduate Expansion on Doctors' Working Patterns study looks at the recent increase in medical graduates entering the health system and the impact this may have on the trainees and the clinicians involved in their supervision and training. This study was commissioned as a piece of supporting research for HW 2025 to highlight any effects of graduate expansion that should be considered when modelling the future workforce and medical trainee numbers. The study identified that medical graduate growth has occurred predominantly in some states while graduate numbers have remained fairly stable in others, and from this was able to group work force data of certain states together to create an 'experimental' and a 'control' group to look for differences in the working patterns of doctors. Because the initial results of the study indicated no significant patterns of the effects of medical graduate expansion, the study was not progressed to its proposed second phase of more in-depth analysis.

Not finding any difference between the groups could be interpreted as an indication the medical system is so far coping well with the increase in medical graduates; however this may be in contrast with the experiences of some of those working in the health system. There may be no difference because of insufficient sensitivity in the measures used, or bias in the samples due to low response, which could be affecting the results. For these reasons HWA recommends readers of this report interpret the findings with considerable caution. For more information on HW 2025 visit www.hwa.gov.au or contact us at jap@hwa.gov.au.

Mark Cormack
Chief Executive Officer
Health Workforce Australia

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About Health Workforce Australia

Health Workforce Australia (HWA) is an initiative of the Council of Australian Governments (COAG), and has been established to address the challenges of providing a skilled, flexible and innovative health workforce that meets the needs of the Australian community, now and into the future.

HWA was established following the development of a \$1.6Bn National Partnership Agreement (NPA) on Hospital and Health Workforce Reform by the Commonwealth and State and Territory Governments in November 2008.

HWA reports to Health Ministers and will operate across health and education sectors to devise solutions that integrate workforce planning, policy and reform with the necessary and complementary reforms to education and training.

HWA's functions include:

- The provision of comprehensive, authoritative national workforce planning, policy and research advice to Ministers, Governments and key decision makers in the health and education sectors.
- Improving and expanding access to quality clinical education placements for health professionals in training across the public, private and non-government sectors. This will be achieved through programs that expand capacity, improve quality and other diversity in learning opportunities. This also includes a national network of simulated learning environments (SLE's) to enhance the quality, safety and efficiency of clinical training.
- Developing and implementing a national program of health workforce innovation and reform. This will encourage the development of new models of healthcare delivery, facilitate inter-professional practice and equip health professionals for current and emerging demands on the health care sector.
- Facilitating a nationally consistent approach to international recruitment of health professionals to Australia.

About the Project

The National Health Workforce Planning and Research Collaboration is a consortium of which HWA is a part, assumed the task of undertaking a substantial program of national health workforce planning and research projects over three years. This study will explore effects on the workforce of the recent increases in medical graduates, and will provide supporting information for the future iterations of the HW 2025 project (formerly the National Training Plan).



Acknowledgments

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1 Executive Summary

- The aim of this project is to examine the impact of medical graduate expansion on the short term working patterns of doctors.
- Data from the Medicine in Australia: Balancing Employment and Life (MABEL) longitudinal survey of doctors, from the Medical Training Review Panel 14th Report, and from the Medical Labour Force Survey from the Australian Institute of Health and Welfare are used.
- The number of intern places is just keeping up with the numbers of graduates, though it is too early to tell whether the number of vocational training places can keep pace with demand for these places. There is also evidence that the increase in the number of supervisors is not growing as fast as the number of interns.
- We compare the working patterns of doctors in Queensland and Western Australia, which experienced the largest increases in graduate numbers, to the working patterns of doctors in Victoria and South Australia, which had no new medical schools during the period examined. We compare the working patterns of junior doctors and their supervisors (specialist registrars and specialists).
- The results show that there are few consistent changes in the working patterns of junior doctors and their supervisors associated with graduate expansion. Both the MABEL and AIHW data, although difficult to compare directly, show little impact of graduate expansion on short term working patterns.
- The results suggest that the growth in junior doctors has been spread across metropolitan and non-metropolitan areas, suggesting that the impact on working patterns may be less than if all new interns were concentrated in existing teaching hospitals. The growth in junior doctors has therefore been absorbed by additional capacity for training in non-metropolitan areas. This might be due to the fact that in Queensland, for example, many interns are being trained outside of traditional teaching hospitals and in other geographic areas, supported by rural clinical schools. This may lessen the expected impact on working patterns as the capacity of the system to train interns has increased.
- The even geographical diffusion of new interns combined with little impact on working patterns suggests that the health system has been able to cope with the influx of interns.
- Any longer term differences in working patterns are more likely to be attributable to differences in training between old and new medical schools, and also the future potential bottleneck of insufficient specialty training places.

2 Background

The aim of this project is to examine the short term effects of the recent increases in medical graduates on the working patterns of senior doctors and junior doctors. As large numbers of pre-vocational trainees begin to flow through the system, there are concerns about:

- the capacity of senior doctors to maintain the same level and quality of supervision and training
- changes in the working patterns and job satisfaction of doctors involved in supervision and training
- changes in the working patterns and job satisfaction of interns
- changes in the quality of the training received by interns

The research will examine changes in the trends in working patterns specialists, specialist registrars, and junior doctors. The issues are related to five main hypotheses about the effect of more junior doctors on working patterns:

For senior doctors engaged in training and supervision:

- Workload may increase as there are more junior doctors to supervise
- The proportion of senior doctors engaging in teaching and supervision increases
- Teaching and supervision are provided in a larger number of locations

For specialist registrars:

- If specialists delegate supervision to registrars, then the registrars' workload may increase and job satisfaction may fall.

For interns:

- Junior doctors may experience a lower workload, assuming the number of patients in hospitals does not increase due to funding constraints.
- With a growing number of interns and a relatively fixed number of senior doctors to train them, each junior doctor will receive less training and supervision by senior doctors. This is more likely to occur if hypothesis (1) is rejected (ie if the workload of senior doctors remains the same).

This project will provide some initial national evidence on the short term impacts on working patterns of senior and junior doctors. A further aim of this project is to examine the feasibility of using existing longitudinal datasets to test these hypotheses.



There were two proposed phases to this research:

Phase I. Initial analysis of the key outcomes includes a comparison of each outcome (means or proportions) over time for the study and comparison group.

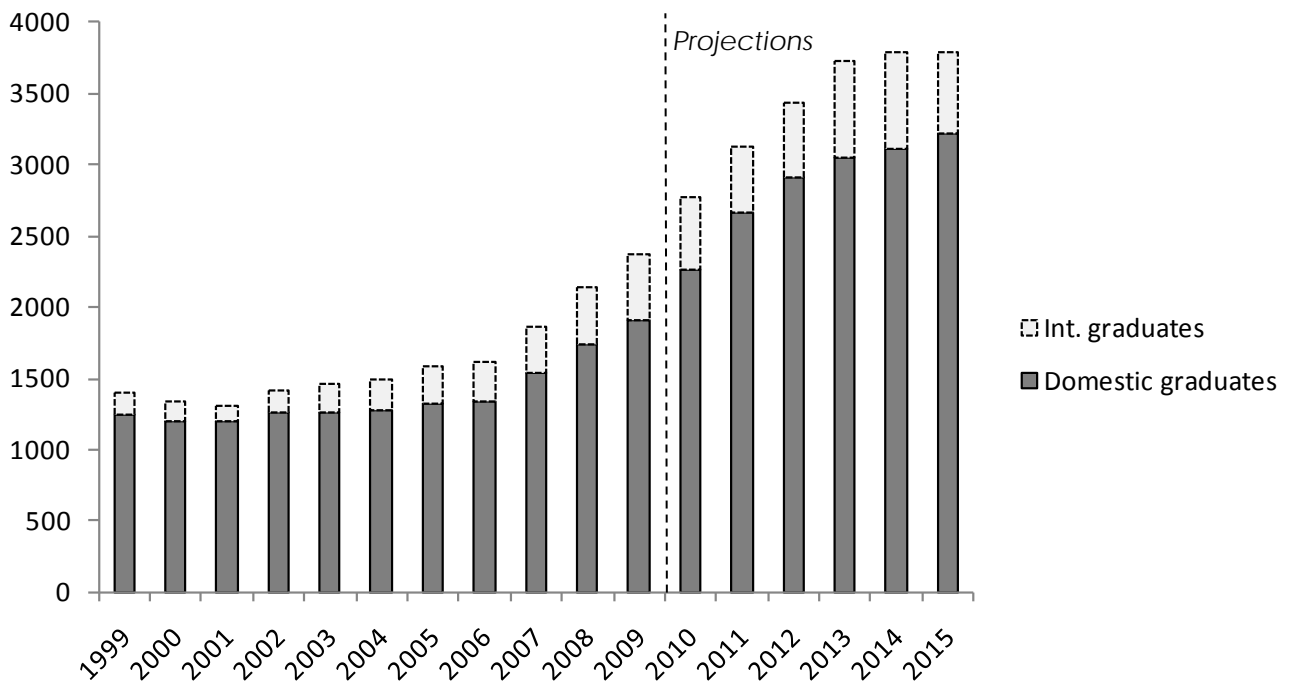
Phase II. Differences in these outcomes may reflect the different composition of the workforce in the two groups. Further analysis would control for differences in the observed characteristics of doctors in each group (age, gender, experience, and specialty) using regression analysis, thus producing more robust results.

As Phase I revealed little consistent patterns of change, Phase II was not conducted.

3 The scale of medical graduate expansion

Medical graduate expansion in Australia began with the establishment of 10 new medical schools since 2000. There are now 18 universities accredited to produce medical graduates and 15 of these had produced graduates by the end of 2009¹. The three others produced their first graduates in 2010 and 2011. The number of new medical graduates started to increase in 2007, though before that the number of international graduates had already started to rise (Figure 1). In 2009, 80% of medical graduates were domestic students. Figure 1 shows that the number of medical graduates has increased by 70% between 1999 and 2009. Domestic graduates have increased by 52% and international graduates increased by 223% over the period. Projections show that by 2015, the number of graduates will have increased by a factor of almost 1.7 since 1999. The types of medical degree have also changed in Australia with a move to many graduate entry and shorter medical degrees. In 2010, 33.8% of 15,397 medical students were undertaking a six year undergraduate course, 28.2% were undertaking a 5-year graduate entry course, and 37.9% were undertaking a 4-year graduate entry course¹.

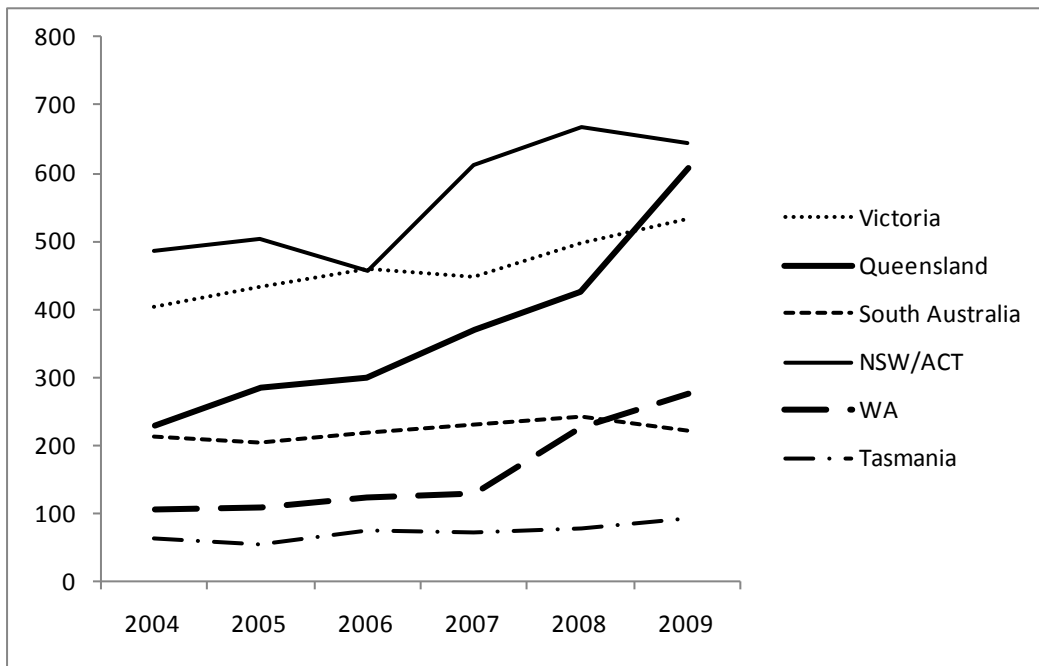
Figure 1. Number of medical graduates: Australia, 1999 to 2015 (Projections from 2010)



Source: Australian Government (2011)

Figure 2 shows how the expansion of medical graduates is distributed by State. This reflects largely the location of new medical schools, including one in Western Australia (WA) that started to produce graduates in 2008, and three new medical schools in Queensland that started to produce graduates in 2005, 2008 and 2009. There are also three new medical schools in New South Wales (NSW) and one in Victoria with their first graduates completing their degrees in 2010 and 2011. The number of medical graduates in Queensland almost tripled (an increase of 165%) between 2004 and 2009, followed by a similar increase of 159% in WA.

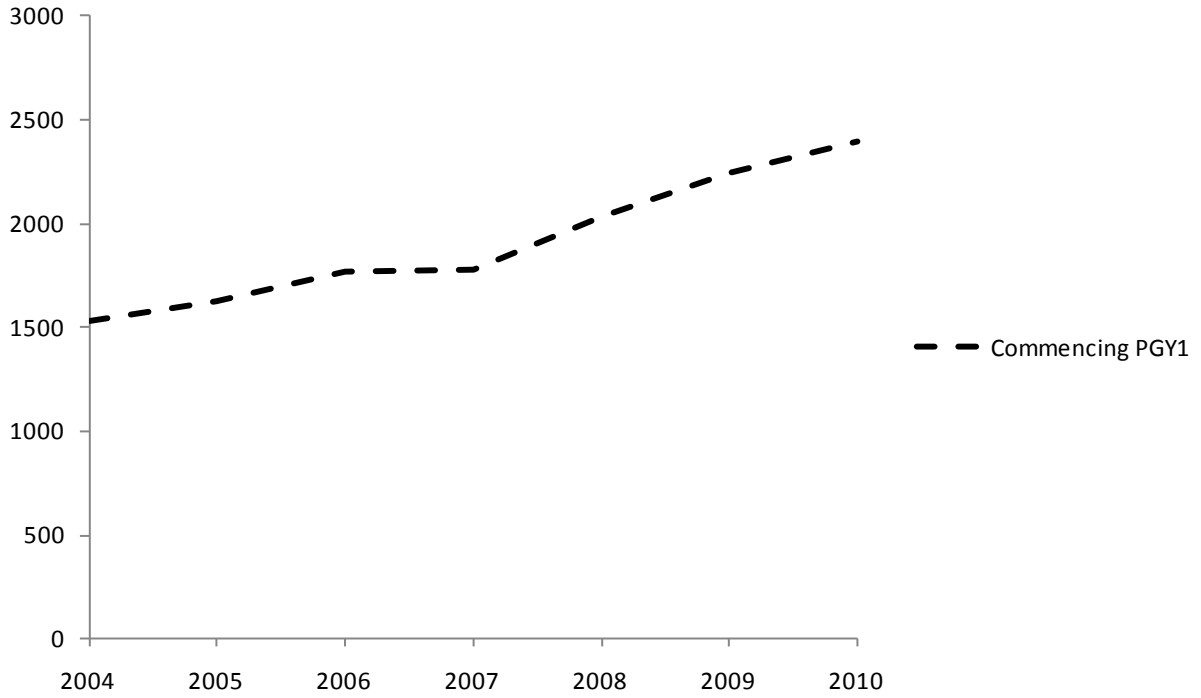
Figure 2. Medical graduate expansion by State, 2004 to 2009



Source: Australian Government (2011)

In Australia, doctors need to complete a pre-registration year (PGY1/intern) before full medical registration, and then two or three other pre-vocational training years before they begin vocational (specialty) training. The numbers of PGY1 doctors began to increase in 2008 (Figure 3). Between 2007 and 2010, the number of PGY1 doctors increased by 56.4% (863).

Figure 3. Numbers of PGY1 doctors (interns), 2004 to 2010



Source: Australian Government (2011).

4 Policies to address medical graduate expansion

The main response from the Federal government to the increased numbers of medical graduates has been to provide additional funding to support the increased number of training places required². The States have also committed to fund more intern (PGY1) places. A focus of the additional funding is for extra training places that are located outside of the usual public teaching hospitals.

The funding of undergraduate and postgraduate clinical training is shared between the State and Territory governments and the Federal government, and accreditation and management of places and the actual training also involves the medical training colleges and State-based postgraduate training councils. This co-funding will continue, but from 2010 Health Workforce Australia now provides additional funds for undergraduate clinical training across 22 health professions, including medicine, rather than the funding being provided solely through different health and education budgets. This is through the Clinical Training Funding Program (CTF), with the first training funds being delivered in 2010. The intention is that the additional funding (and the existing funding from States and territories) is to provide opportunities to train in a wider range of settings. The additional funding represents a 30% increase over estimated clinical training costs per student³. It includes a 50% clinical training subsidy for undergraduates of \$496m between 2009-10 and 2012-13 administered by HWA, a postgraduate clinical training subsidy for GPs and the private sector of \$86.2m between 2011-12 and 2012-13 administered by the Federal government, in addition to extra funding for increased supervisory capacity, and funding for capital infrastructure of \$175m over four years. This includes:

- \$45m to States and territories to support simulated learning environments to improve access to training and increase productivity/efficiency in the training system. Through this program a national simulator educator and technician training initiatives is also being delivered.
- \$90m to support innovative teaching and training initiatives, and
- \$40m to support training in major regional hospitals as part of the rural clinical schools program.

HWA is also establishing Integrated Regional Clinical Training Networks – to establish broad membership networks across the public, private and non-government health sectors as well education and training sectors to provide coordinated approaches to the management and delivery of clinical training across Australia.

In addition, there is a new program of funding to support vocational specialist training in the private sector (hospitals and practices), and outside of public teaching hospitals including



regional, rural and ambulatory settings. Introduced in January 2010 and administered by the Federal government, the Specialist Training Program (STP) consolidates a number of existing programs. The aims and objectives to:

- increase the capacity of the health workforce to train specialists;
- better train specialists with education that matches the nature of demand and reflects the way health services are delivered;
- develop networked specialist training arrangements, which are:
 - integrated series of accredited training sites focusing on providing health care, through which trainees may rotate in the pursuit of specialist qualification;
 - based on health service delivery requirements of a region with the education potential of training sites being matched to the health service delivery potential inherent in increased availability of a specialist trainee workforce.

In 2011, there were 518 training posts funded under the STP, with these set to expand to 600 in 2012. The level of funding available for training posts is a salary contribution of \$100,000 (ex GST) per FTE. Posts in rural locations may also be provided with rural loadings, of up to \$20,000 (ex GST) per FTE. In addition to establishing specialist training posts, the program also provides funds for clinical supervision of up to \$30,000 (ex GST) per annum and training infrastructure of up to \$10,000 (ex GST) every three years for all private sector STP training.

5 The effects of medical graduate expansion

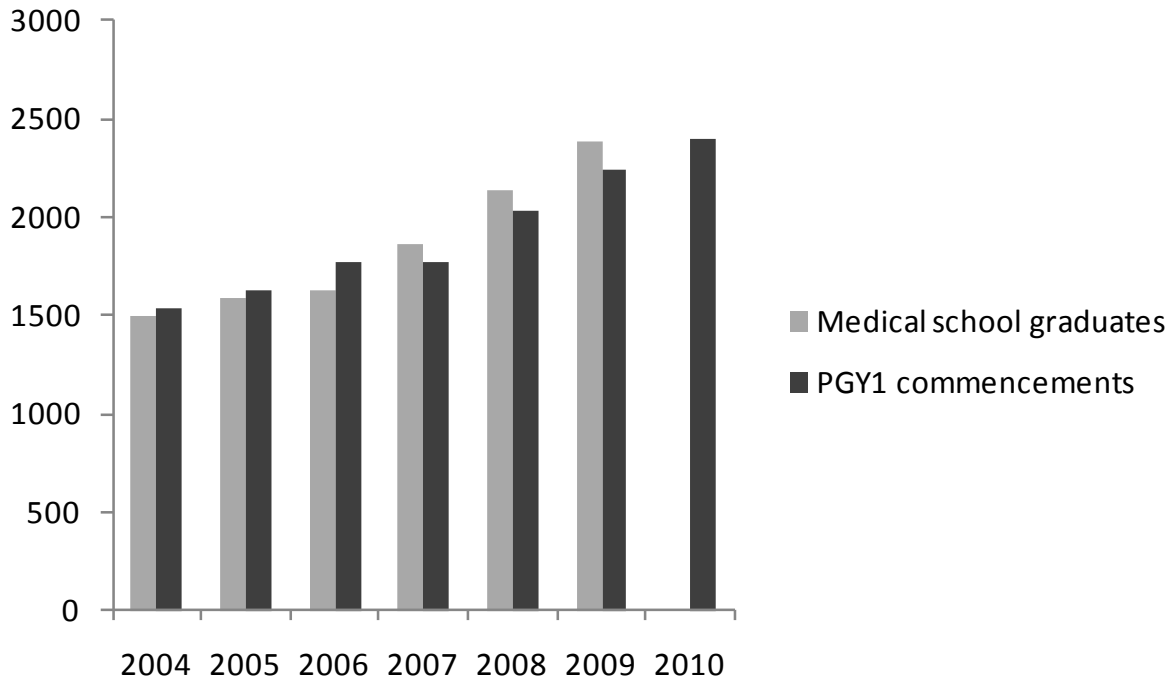
There are number of short and long term effects of medical graduate expansion. This includes effects on health care costs, quality of care and population health, working patterns and the geographical and sectoral distribution of doctors. A key issue is the capacity of the system to train these additional doctors. This research will focus on the short term effects of medical graduate expansion on doctors' working patterns. Various issues are discussed below and illustrated with evidence from Australia or examples of how Australian policy makers are responding.

Are intern places keeping up with graduate expansion?

If the number of training places does not grow sufficiently in the short term, then interns may have difficulty finding an internship. There is anecdotal evidence that competition for intern places has increased, and an explicit policy that internship places can be guaranteed only for medical graduates who are Australian citizens or residents³. Preference is being given to domestic graduates rather than international graduates, a policy congruent with the stated objective of self-sufficiency⁴.

Figure 4 combines data from Figures 1 and 3, and shows the growth of intern places is largely keeping pace with the numbers of graduates, given the one-year lag in the data between graduating and commencing as an intern. For example, in 2009 there were 2,380 medical graduates and 2,394 PGY1 commencements in 2010. Similarly, if the number of vocational training places is also fixed, then competition for these places may increase. Only the best doctors would then secure vocational training places. A shortage of places will result in more doctors who work as non-specialists, medical officers, or in clinical research for a longer period of time.

Figure 4. Medical graduate numbers and PGY1 commencements, 2004 to 2010



Effects on doctors' working patterns.

The short term effects of medical graduate expansion on doctors working patterns are largely due to changes in the flow of doctors through the training system, including bottlenecks at key stages. These can influence doctors working patterns and the length of time it takes to complete specialist training. This is likely to occur if there is a delay between the growth in junior doctors and the capacity and ability of the system to train these doctors to the same standard as previously.

Effects on senior doctors.

As large numbers of pre-vocational trainees begin to flow through the system and with a fixed number of senior doctors to supervise and train, the ability and capacity of senior doctors to train these additional junior doctors depends on a number of factors. First, senior doctors may be unaffected if the additional supervisory responsibilities are delegated to registrars, or training takes place in a larger number of locations (i.e. not only teaching hospitals) and by a larger pool of senior doctors. Assuming that senior doctors are better trainers than registrars, then any delegation of training has implications for the quality of training being provided. Alternatively, senior doctors may increase their total hours worked to accommodate the additional training workload. If they do not, then they may 'give up' other activities to train these extra junior doctors. Senior doctors may also undertake less

work in the private sector assuming they are rewarded for their additional public sector teaching workload. This raises the issue of what incentives are being used to persuade senior doctors to undertake more supervision, and what support is being provided to senior doctors who are new to training pre-vocational trainees, particularly in non-metropolitan areas.

Effects on junior doctors.

The working patterns of junior doctors may also be affected. If patient throughput cannot increase in public hospitals because of budget or volume caps, then junior doctors may work fewer hours, be more satisfied with their job, and work fewer 'unsafe' hours, therefore having a positive effect on medical errors and adverse events. However, working fewer hours may also mean they have less accumulated experience, and this could also adversely influence quality of care.

Effects on specialist registrars.

This group will provide much 'informal' supervision of interns and so, if senior doctors experience no change in working patterns, one might expect to see the workload of registrars increase.

Some preliminary evidence on the short term effects on working patterns is provided in the Figures below. These use data from the first three waves of the Medicine in Australia: Balancing Employment and Life (MABEL) longitudinal survey of doctors⁵. Similar data from the AIHW Medical Labour Force Survey are shown in the Appendix, which also compares the two data sources.

We compare groups of doctors from those States that have experienced the largest increase in graduates between 2007 and 2009, with a comparison group of States during the same period that experienced the lowest increases in graduates. During this period, new medical schools in Queensland and Western Australia began to produce the largest numbers of graduates. We therefore compare these States with doctors in Victoria and South Australia (Figure 2) which had the lowest observed growth and no new medical schools in that period.

One would expect to see differences between the working patterns of doctors in these groups. *Note the data below have not controlled for differences across the groups in age, gender and other factors that affect working patterns, nor have we conducted tests of statistical significance, and so the results are preliminary.*

Are more specialists involved in training pre-vocational trainees?

The survey included a question for specialists and GPs in Waves 2 (2009) and Wave 3 (2010) asking whether they were involved in training/supervising interns and vocational trainees. The data are weighted so they are nationally representative⁵. Figure 5 shows that just under half of specialists in Australia are involved in training interns and pre-vocational trainees. The proportion of specialists involved in training interns is higher in QLD/WA than in VIC/SA, though these differences are not statistically significant. The data also show a small increase

of 1.6 percentage points in the proportion of specialists involved in training junior doctors between 2009 and 2010, but again this difference is not statistically significant. Figure 6 shows the same data for GPs. Though the proportion of GPs involved in training junior doctors has increased by 1.5 percentage points between 2009 and 2010, this increase is not statistically significant.

These proportions can be used to estimate the changes in the total number of specialists involved in training junior doctors across the two groups (Figure 7). The proportions are applied to the MABEL sampling frame (the AMPCo Medical Directory) of all specialists in clinical practice in 2009 and 2010. In QLD/WA there has been an estimated increase of 216 specialists who are involved in training interns and pre-vocational trainees, compared to an increase of 45 specialists in VIC/SA.

Figure 5. Proportion of specialists involved in training interns and pre-vocational trainees

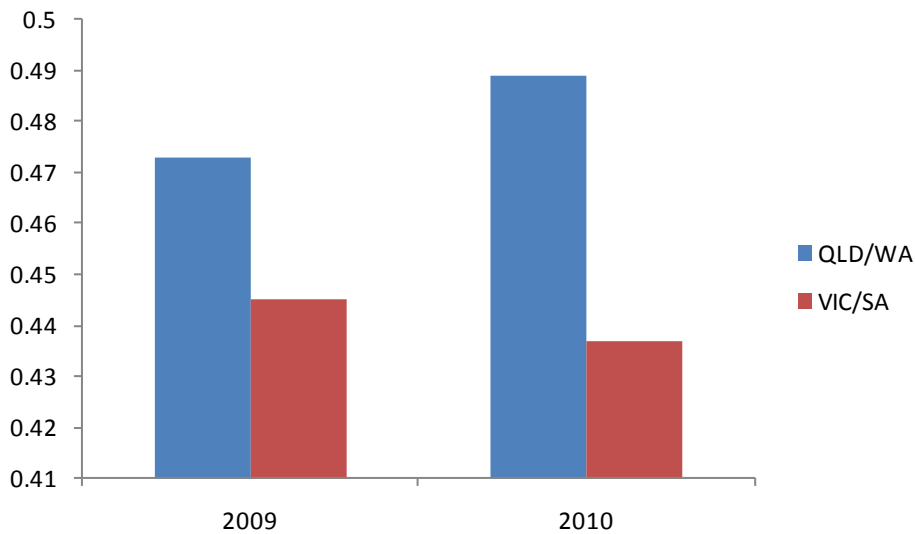


Figure 6. Proportion of GPs involved in training interns and pre-vocational trainees

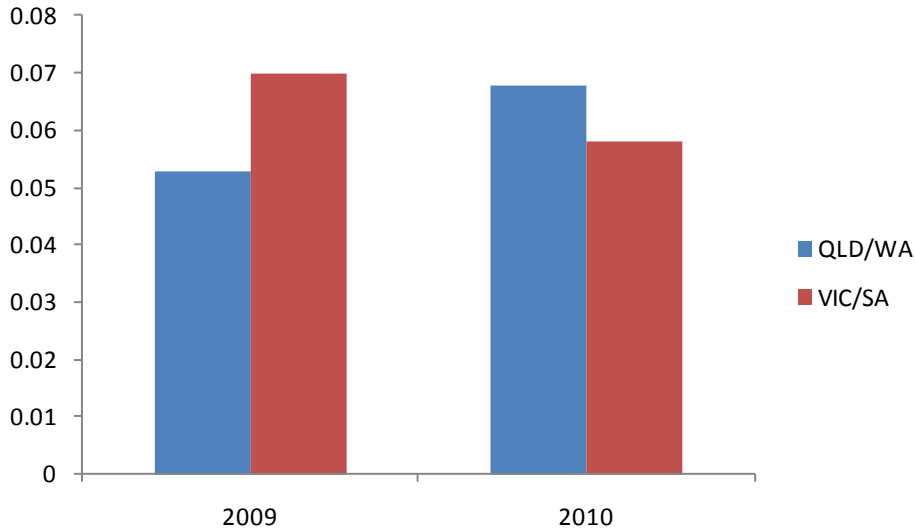
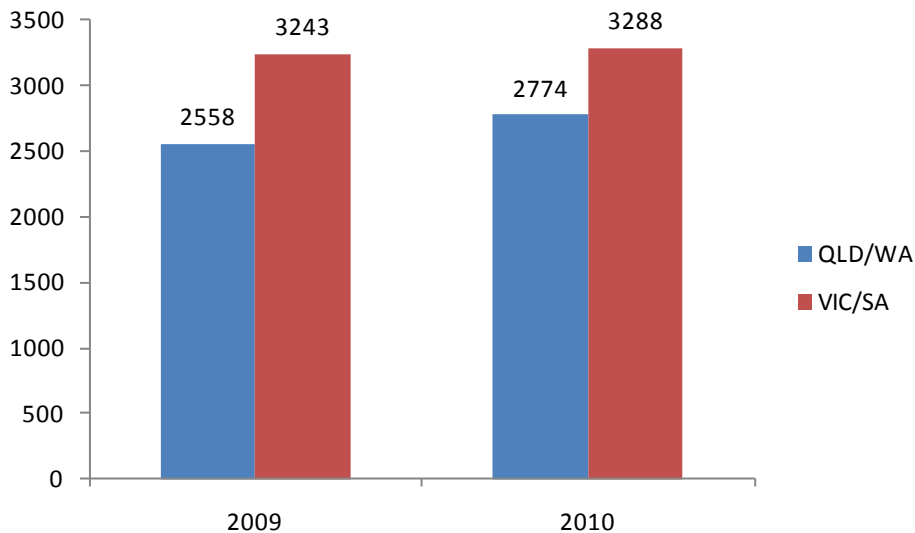


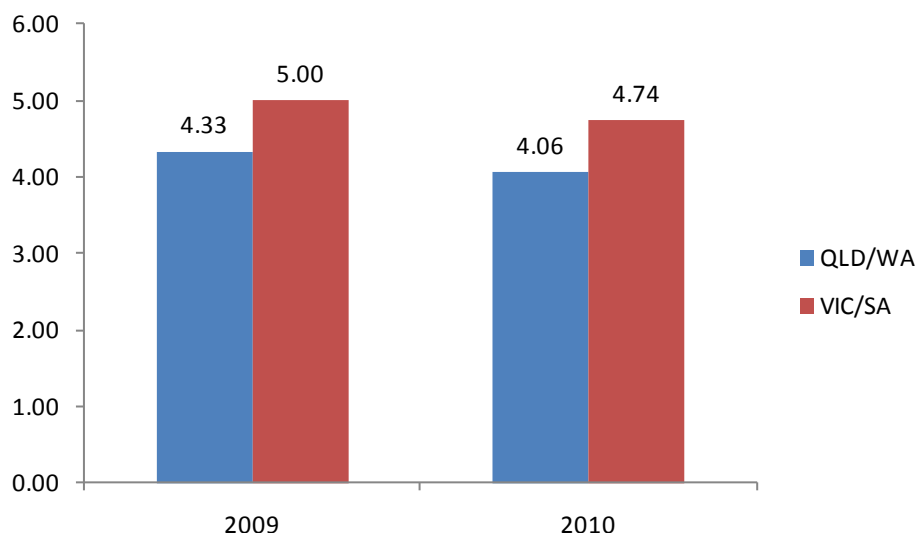
Figure 7. Estimated total number of specialists involved in training interns and pre-vocational trainees



We can also combine these data with the data on PGY1 commencements to show the number of specialist supervisors per PGY1 commencement. This gives an idea of whether the increase in the number of supervisors is keeping pace with the number of PGY1 commencements. The figures below combine data for specialists and GPs who are supervising or training interns and pre-vocational trainees. The ratio of supervisors to PGY1 has fallen in both groups of states, though there is a slightly higher percentage fall in QLD/WA (6.2%) than in VIC/SA (5.3%). This suggests that there are fewer supervisors per PGY1 doctor in

2010 compared to 2009 and that the increase in the number of supervisors is not keeping pace with the expansion in graduates.

Figure 8. The number of specialists involved in training per PGY1 commencement



The effects of expansion on senior doctors

The first set of figures are for senior doctors (specialists) who indicated in the survey that they are teaching or supervising interns or pre-vocational trainees. These are doctors who completed all of the first 3 waves of MABEL, and so show changes over time for each doctor. Depending on the question there are up to 1,300 senior doctors who responded to the survey in VIC/SA and up to 833 senior doctors in QLD/WA. There seems to be few effects on senior doctors involved in training pre-vocational trainees. The trends in the two geographical groups are generally similar. Trends in total hours worked and the number of patients seen are similar (see Figure A1 and Figure A2 in Appendix 2), suggesting that senior doctors may have absorbed the additional supervisory activity, delegated it to registrars, or that there are more senior doctors undertaking training.

The proportion of hours spent in direct patient care has declined in both groups, but the size of the decrease has been slightly lower for doctors in QLD/WA (Figure A3 in Appendix 2). The proportion of senior doctors providing after-hours on-call services slightly jumped in 2009 in QLD/WA compared to that in VIC/SA, but the declining trend is similar for both groups (Figure A4 in Appendix 2). Trends of the actual on-call times per week are similar across the two groups (Figure A5 in Appendix 2).

There has been an increase in the number of weeks holiday taken (Figure 9) for those in QLD/WA compared to those in VIC/SA. Trends in perceptions of work-life balance are similar (Figure A6 in Appendix 2). The proportion of senior doctors being moderately or very satisfied with their job has increased in both groups, though the size of the increase has been lower for doctors in QLD/WA (Figure 10). Senior doctors have been more satisfied with the amount of responsibility given and with the freedom to choose their own methods of working in both groups, and these trends are similar across the groups (see Figure A7 and Figure 8 in Appendix 2). There are fewer senior doctors who think it is difficult to take time off work when they want to in both groups, though this decreasing trend is stronger in QLD/WA (Figure 11). More senior doctors stated that they are "likely" or "very likely" to leave direct patient care (Figure A9 in Appendix 2) or leave medical work entirely (Figure A10 in Appendix 2) in both groups, with a slightly higher proportion in QLD/WA than in VIC/SA.

Figure 9. The number of weeks holiday taken; senior doctors involved in training interns and pre-vocational trainees

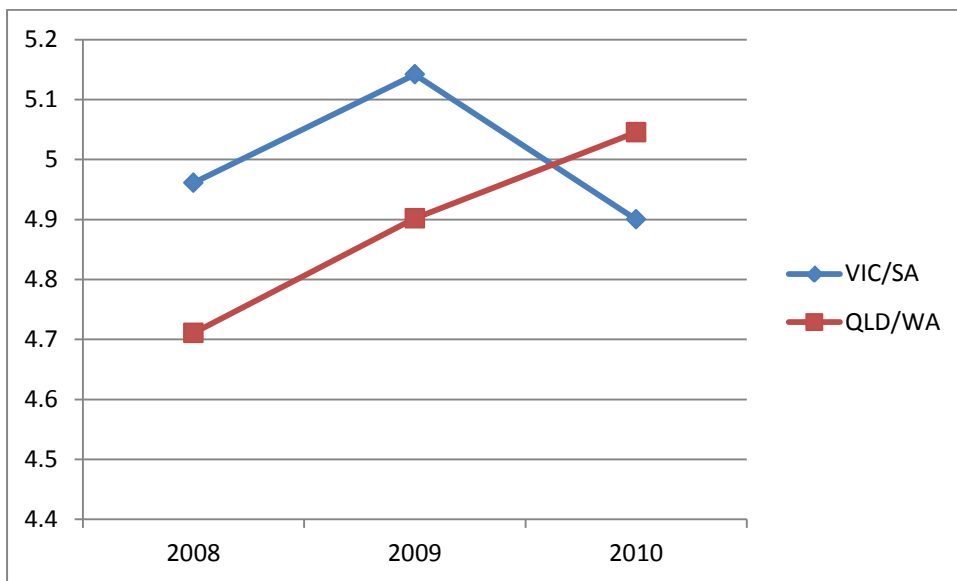


Figure 10. Proportion of senior doctors moderately or very satisfied with their jobs overall

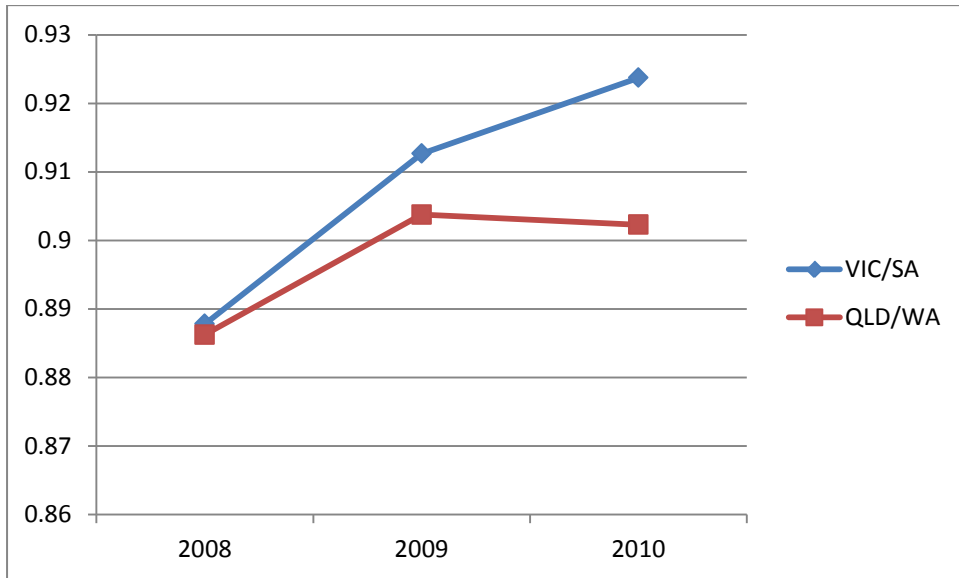
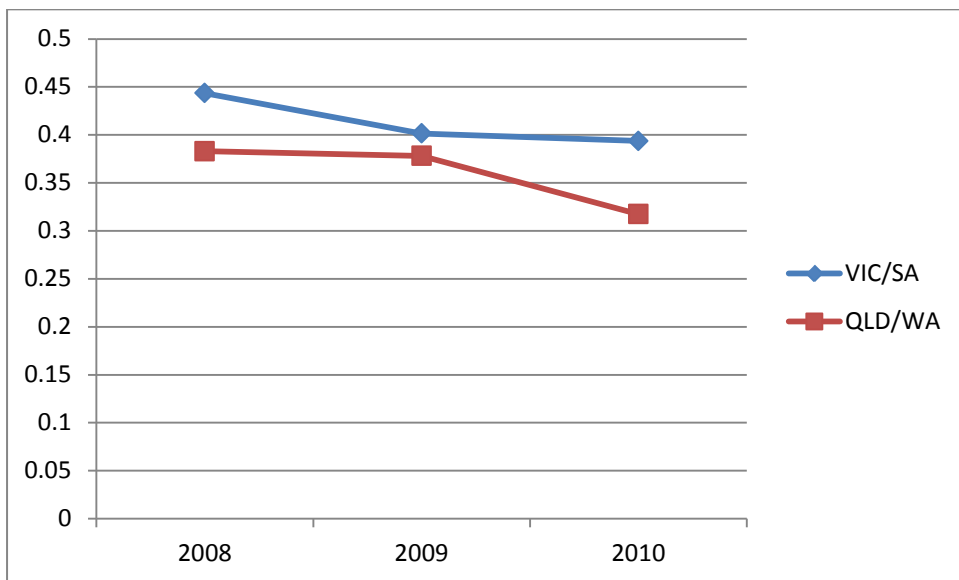


Figure 11. Proportion of senior doctors agreeing with the statement 'It is difficult to take time off work when I want to'



The effects of expansion on junior doctors

We also examined the working patterns of junior doctors in 2008, 2009 and 2010. These are doctors who identified themselves as interns, or hospital medical officers year 1 and hospital medical officer year 2. In QLD/WA and across the three years, there are up to 579 doctors included in the analyses, and in VIC/SA there are up to 561 doctors, depending on the question answered.

There was little evidence of an effect on total working hours for junior doctors. There was evidence that those in QLD/WA were seeing fewer patients per week (Figure 12), and also spending a lower percentage of their time in direct patient care (Figure 13) compared to those in VIC/SA where medical graduate expansion did not take place. The proportion of junior doctors providing after-hours on-call services has declined at similar rate in QLD/WA and VIC/SA (Figure A11 in Appendix 2). Trend of the actual on-call times per week is also similar across the two groups (Figure A12 in Appendix 2). There has been little change in the number of weeks holiday taken for junior doctors (Figure 13 in Appendix 2). Junior doctors in QLD/WA are more likely to agree that the balance between their personal and professional commitments is about right (Figure 14) compared to junior doctors in VIC/SA. There are less junior doctors who think it is difficult to take time off work when they want to in both groups, though this decreasing trend is slightly lower in QLD/WA compared to VIC/SA (Figure A14 in Appendix 2).

Figure 12. Number of patients seen in last usual week; junior doctors

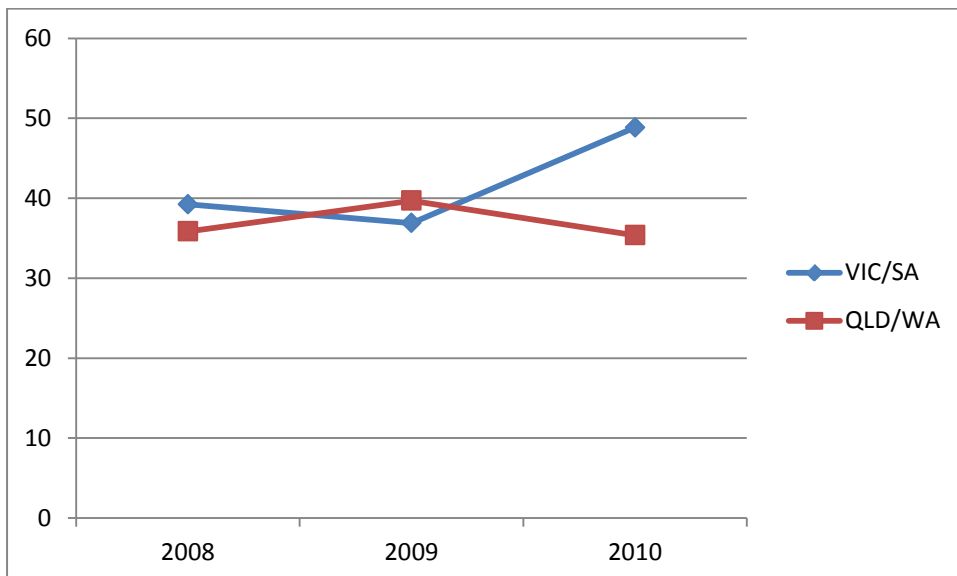


Figure 13. Proportion of hours spent in direct patient care; junior doctors

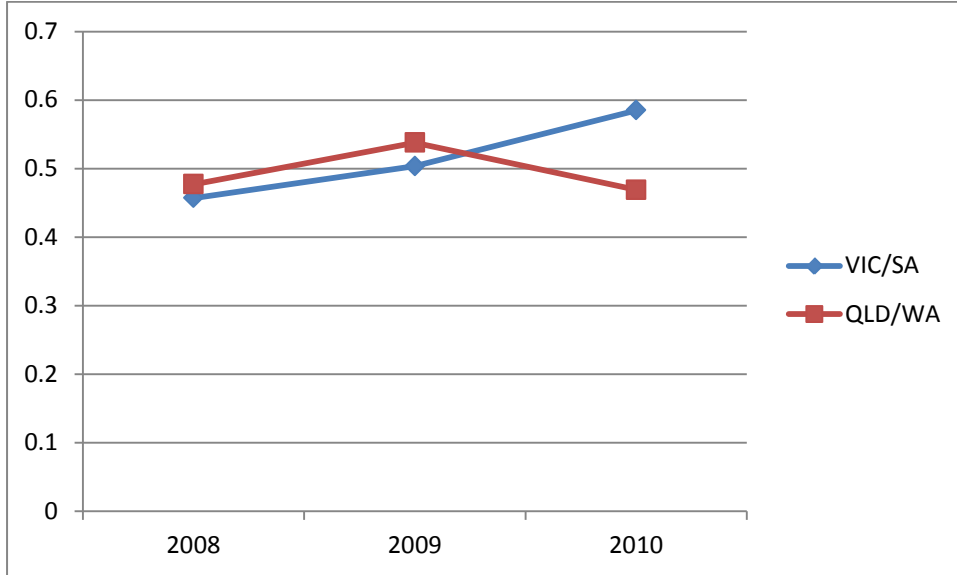
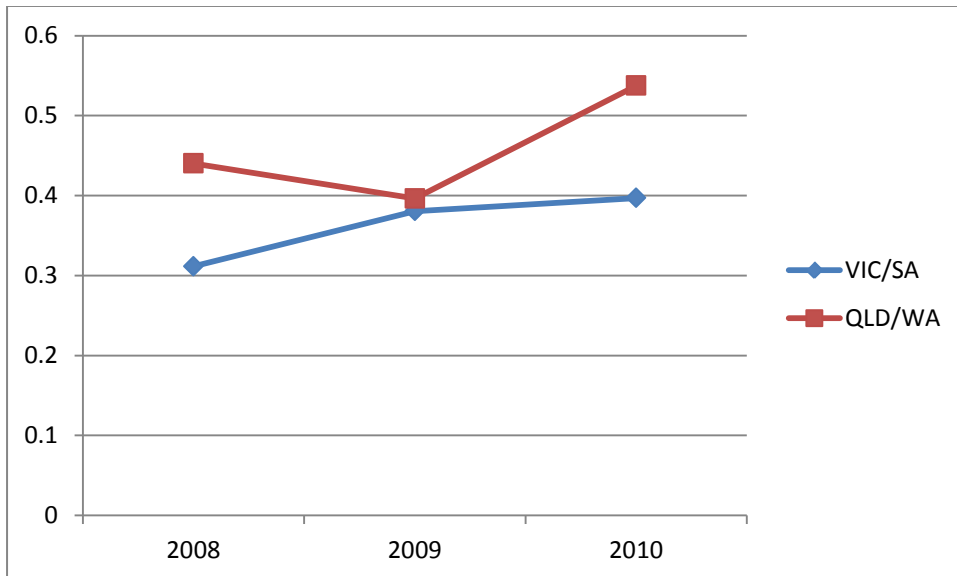


Figure 14. Proportion of junior doctors agreeing with the statement 'The balance between my personal and professional commitments is about right'



Junior doctors in QLD/WA also reported an increase in whether they agree with the statement, 'I receive good support and supervision from qualified specialists (Figure 15). The proportion agreeing with this statement in VIC/SA has fallen. This may be a consequence of a lower patient workload, rather than any changes in the amount and quality of supervision they are receiving. Job satisfaction has also remained relatively high, whilst in VIC/SA it is falling (Figure 16). Junior doctors in QLD/WA are also more likely to be satisfied with the amount of responsibility they are given, whereas this is falling in VIC/SA (Figure 17). Job satisfaction in terms of the freedom to choose own method of working has had little change over time for junior doctors in both groups (Figure A15 in Appendix 2). The proportion of junior doctors who stated that they are "likely" or "very likely" to leave direct patient care or leave medical work entirely remains very low, with a slightly declining trend in both QLD/WA and VIC/SA (see Figure A16 and Figure A17 in Appendix 2).

Figure 15. Proportion of junior doctors agreeing with the statement, 'I receive good supervision and support from qualified specialists'.

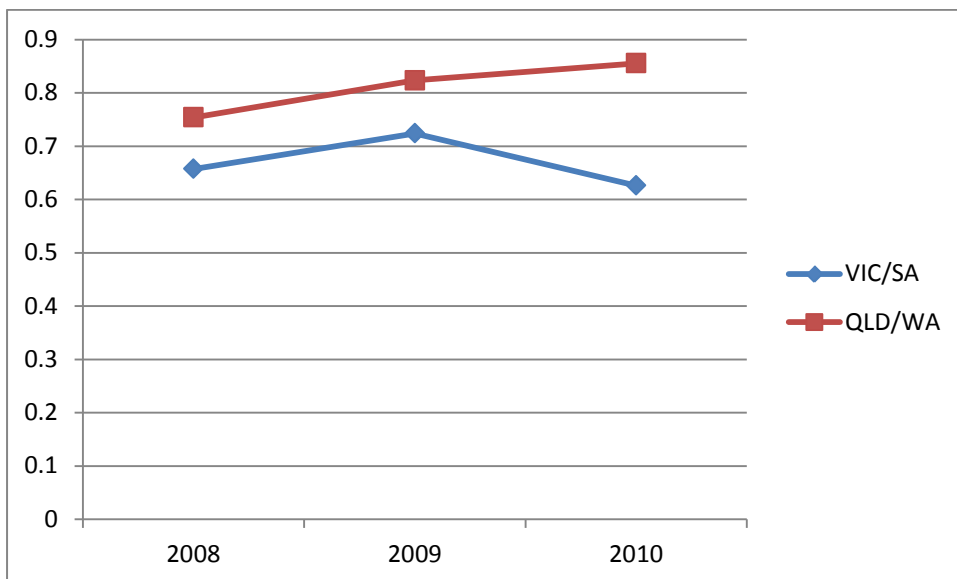


Figure 16. Proportion of junior doctors moderately or very satisfied with their job overall

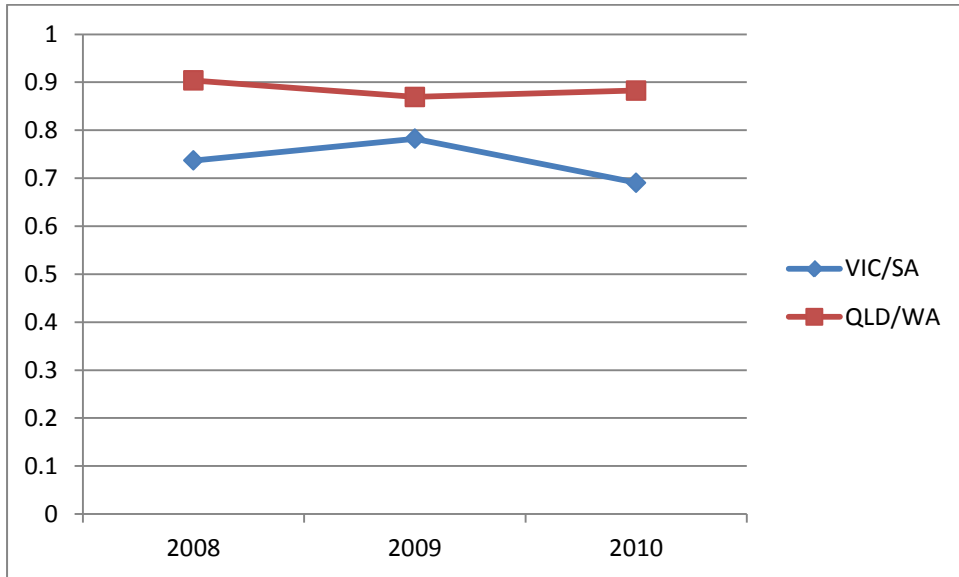
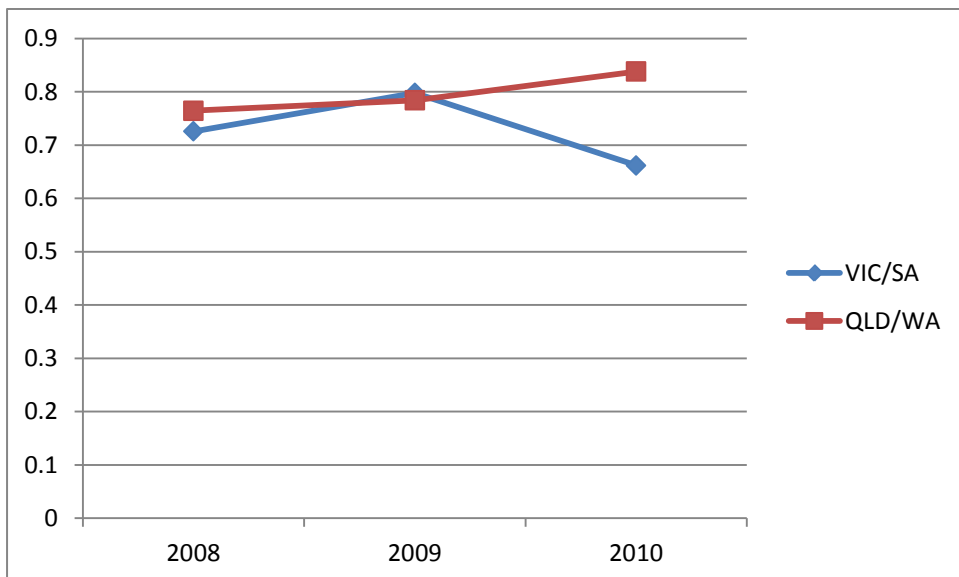


Figure 17. Proportion of junior doctors moderately or very satisfied with the amount of responsibility they are given.



The effects of expansion on specialist registrars

Senior doctors may be unaffected by medical graduate expansion if the additional supervisory responsibilities are delegated to registrars. In order to test this hypothesis, we examined the working patterns of specialist registrars using the MABEL data (results for AIHW data are shown in the Appendix). These are doctors who responded to the Specialist Registrar Survey and also reported that they spent at least some time in education activities in the most recent usual week in all 3 waves of MABEL. Since we are using the longitudinal sample for the descriptive analysis, the trends show changes over time for each specialist registrar. Note that using the working hours spent in education activities does not perfectly identify the specialist registrars who involved in teaching or supervising interns or pre-vocational trainees, because this includes time spent on academic research and continuing medical education as well.

There seem to be few effects on the working patterns of specialist registrars. The trends in the two geographical groups are generally similar except for total working hours, the proportion of hours spent in direct patient care and the number of patients seen in the last usual week.

Total hours worked has declined from 2008-2009 in both QLD/WA and VIC/SA but increased for VIC/SA and decreased further in QLD/WA from 2009-2010 (Figure 18). The proportion of hours spent in direct patient care has declined in QLD/WA but increased in VIC/SA (Figure 19). The number of patients seen has declined substantially in QLD/WA, but has remained about the same in VIC/SA (Figure 20). Combining these patterns together, there is no evidence that registrars in QLD/WA have experienced any increases in workload compared to those in VIC/SA.

Figure 18. Total hours worked; specialist registrars

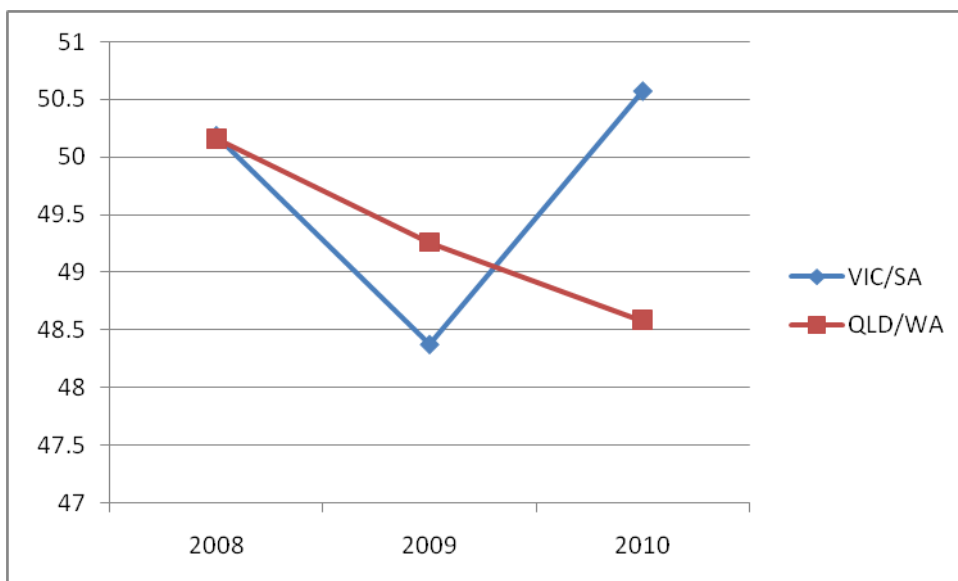


Figure 19. The proportion of hours spent in direct patient care; specialist registrars

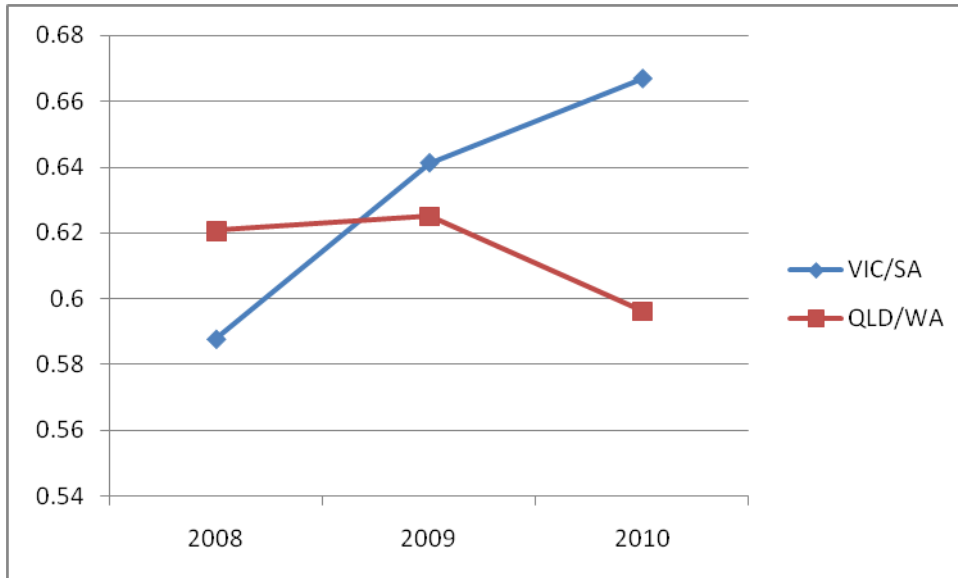
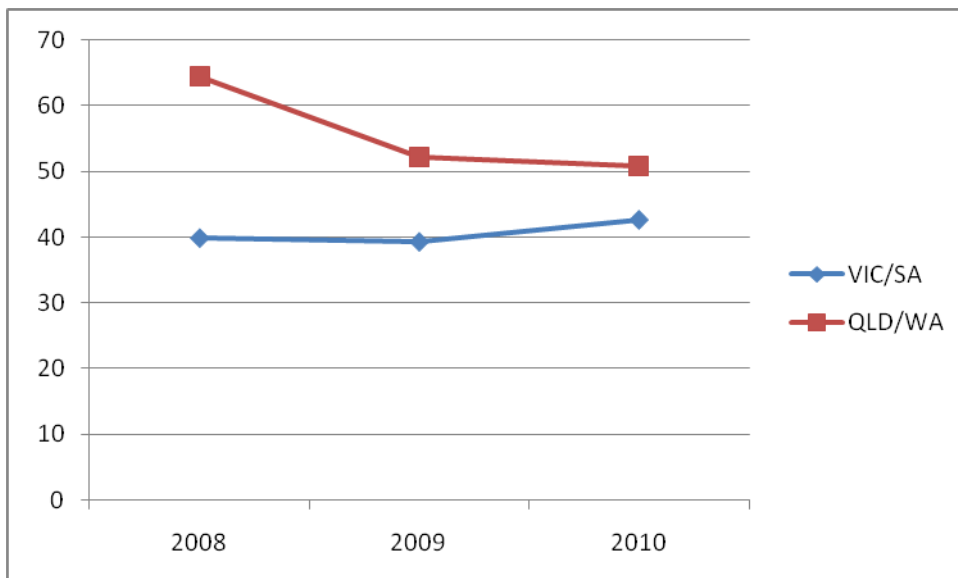


Figure 20. Number of patients seen per week; specialist registrars



The proportion of specialist registrars providing after-hours on-call services is very similar in QLD/WA and in VIC/SA (Figure A18 in Appendix 2). Trends of the actual on-call times per week are also similar across the two groups (Figure A19 in Appendix 2). The number of weeks holiday taken is always higher in VIC/SA than in QLD/WA (Figure A20 in Appendix 2) but the trend is the same for both groups.

The proportion of specialist registrars agreeing with that they have the right work-life balance has remained the same in QLD/WA but has declined in VIC/SA (Figure A21 in Appendix 2). Slightly fewer registrars found it difficult to take time off in QLD/WA but there is no discernible trend in VIC/SA (Figure A22 in Appendix 2). The proportion of specialist registrars being moderately or very satisfied with their job has increased in both groups and trends is almost identical for both groups ((Figure A23 in Appendix 2)). Specialist registrars have been more satisfied with the amount of responsibility given and with the freedom to choose their own methods of working in both groups, and these trends are similar across the groups (see Figure A24 and Figure A25 in Appendix 2). Fewer specialist registrars stated that they are "likely" or "very likely" to leave direct patient care (Figure A26 in Appendix 2) in both groups

6 Conclusion

Australia is currently experiencing a relatively rapid increase in medical graduates, and has recently instigated a number of policies to increase the number and locations of clinical training places. Existing data show that the number of intern places is just keeping up with the numbers of graduates, though it is too early to tell whether the number of vocational training places can keep pace with demand for these places. There is also evidence that the increase in the number of senior supervisors is not growing as fast as the number of interns. Results on changes in short term working patterns show few effects on junior doctors, or on specialist registrars and specialists, who are supervising interns and prevocational trainees.

We also present evidence of the geographical spread of interns. This shows that growth has occurred equally in metropolitan areas (i.e. traditional teaching hospitals) and non-metropolitan areas.

Combining the results of little effect on workload and an even geographic diffusion of interns, suggests that the health system has so far been able to absorb the increased intakes of interns.

The longer term impact of graduate expansion depends on how doctors flow through the system. The additional graduates have yet to apply for vocational training and choose their specialty. This will be the next potential bottleneck that policy makers will need to address. The opportunity to introduce policies to manage this flow is important if the existing maldistribution of doctors across geographic areas and specialities is to change in the future.

7 References

1. Australian Government. Medical Training Review Panel Fourteenth Report. Canberra: Australian Government 2011.
2. Council of Australian Governments. National Partnership Agreement on Hospital and healthj Workforce Reform. Canberra: Council of Australian Governments 2008.
3. Australian Health Ministers' Conference. Communiqué 12th February. Canberra: Australian Government Department of Health and Ageing 2010.
4. Elkin K, Studdert D. Restricted career paths for overseas students graduating from Australian medical schools: legal and policy considerations. *Medical Journal of Australia*. 2010;192:517-9.
5. Joyce C, Scott, A, Jeon, S, Humphreys, J, Kalb, G, Witt, J, Leahy, A. . The "Medicine in Australia: Balancing Employment and Life (MABEL)" longitudinal survey - Protocol and baseline data for a prospective cohort study of Australian doctors' workforce participation. *BMC Health Services Research* 2010;10:50.

Appendix 1. Professions covered by HWA's Clinical Training Funding Program

Professions
Medicine
Nursing
Audiology
Dentistry
Dietetics
Exercise Physiology
Medical Laboratory Science
Midwifery
Occupational Therapy
Oral Health
Orthoptics
Orthotics and Prosthetics
Paramedicine
Pharmacy
Physiotherapy
Podiatry
Psychology
Radiation Science
Social Work
Sonography
Speech Pathology
Aboriginal and Torres Strait Islander Health Worker



Appendix 2. Supplementary figures

Figure A1. Total hours worked; senior doctors involved in training interns and pre-vocational trainees

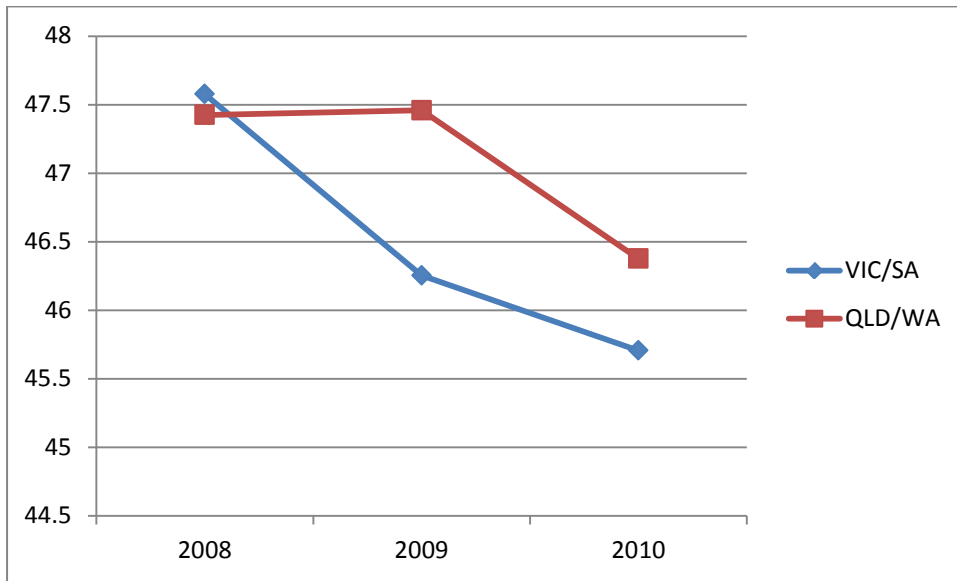


Figure A2. Number of patients seen per week; senior doctors involved in training interns and pre-vocational trainees

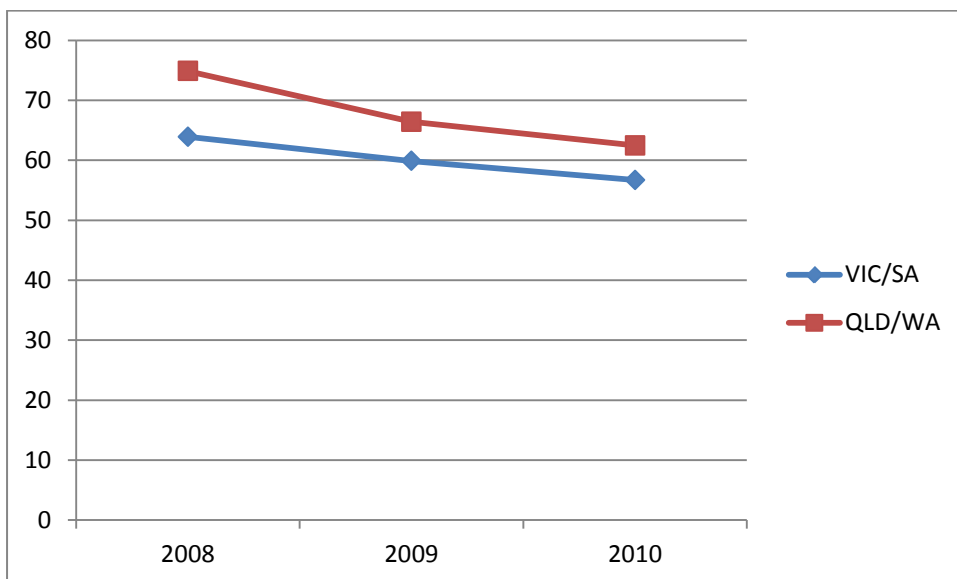


Figure A3. The proportion of hours spent in direct patient care; senior doctors involved in training interns and pre-vocational trainees

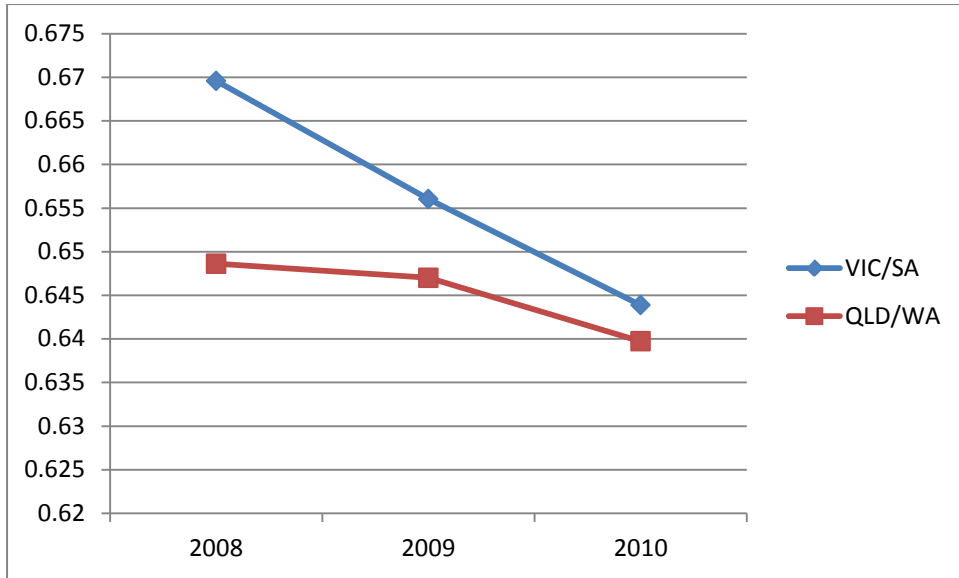


Figure A4. The proportion of senior doctors providing after-hours on-call services

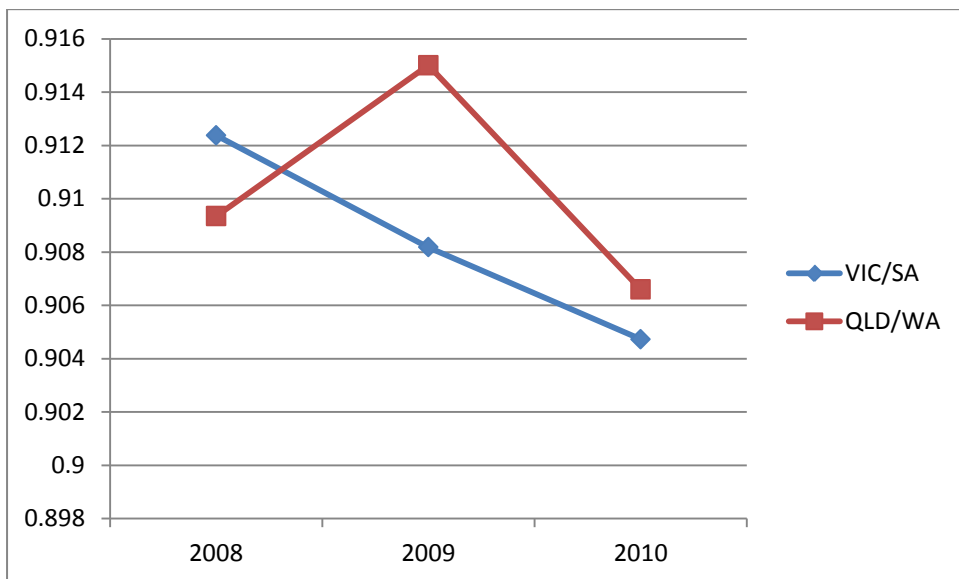


Figure A5. Actual number of times senior doctors providing on-call services in the last usual week at work

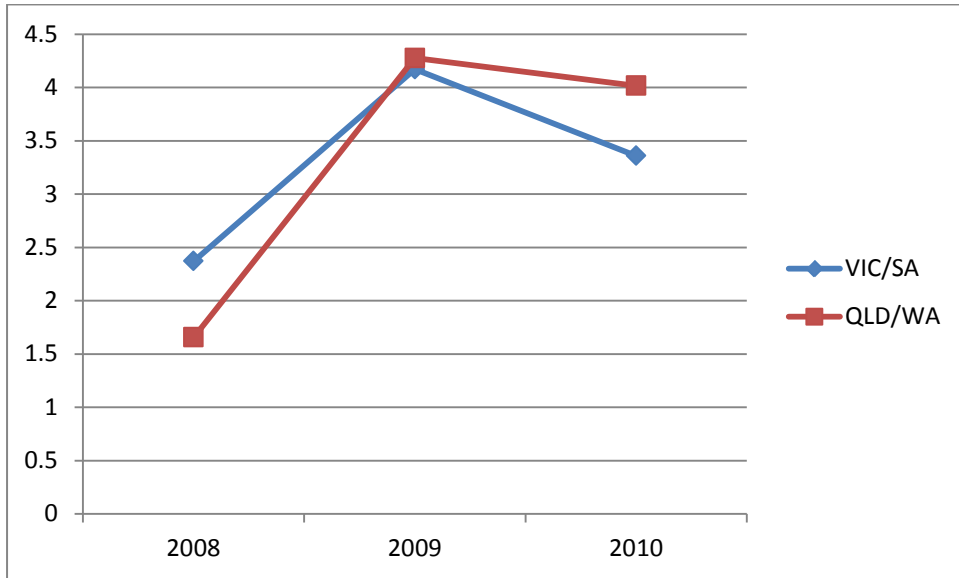


Figure A6. Proportion of senior doctors agreeing with the statement 'The balance between my personal professional commitments is about right'

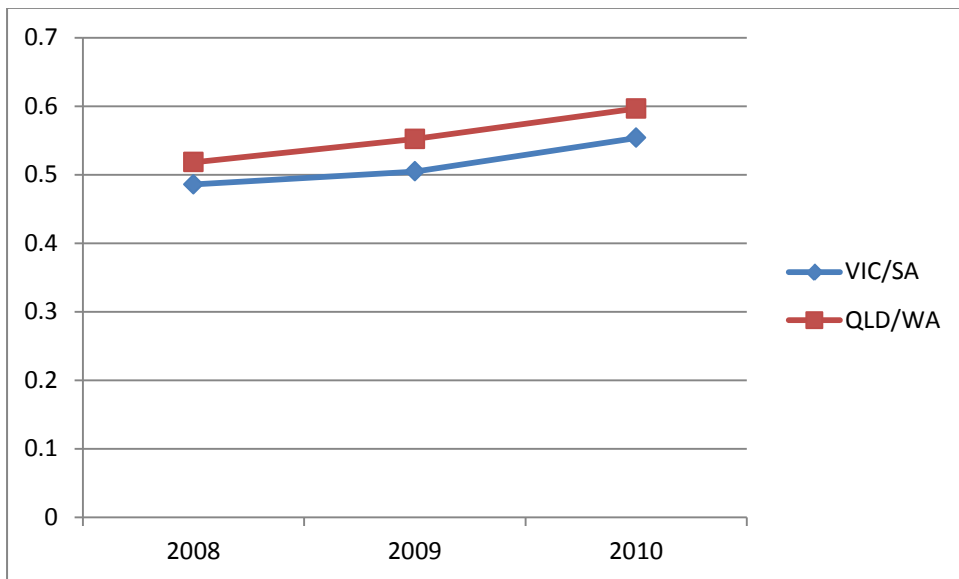


Figure A7. Proportion of senior doctors moderately or very satisfied with amount of responsibility given

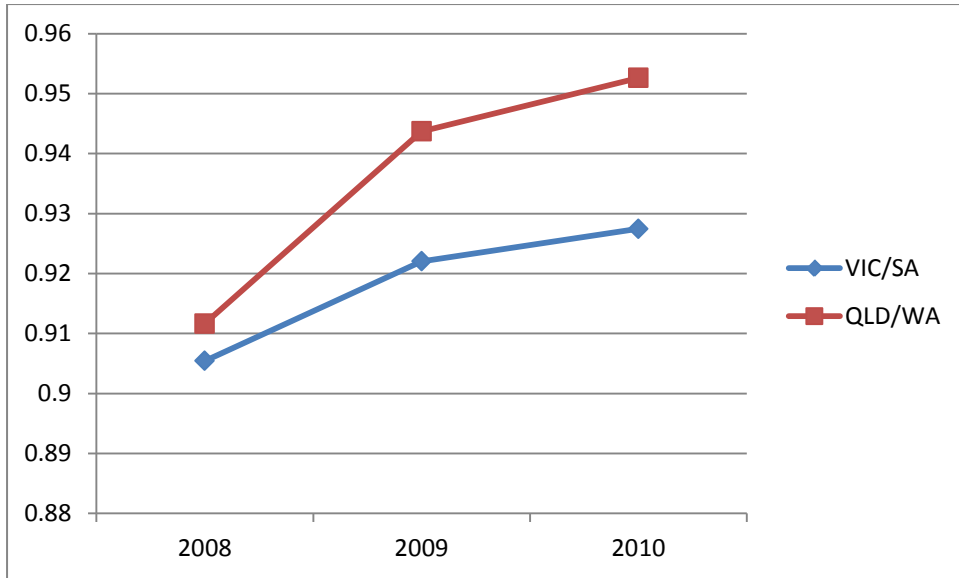


Figure A8. Proportion of senior doctors moderately or very satisfied with freedom to choose own method of working

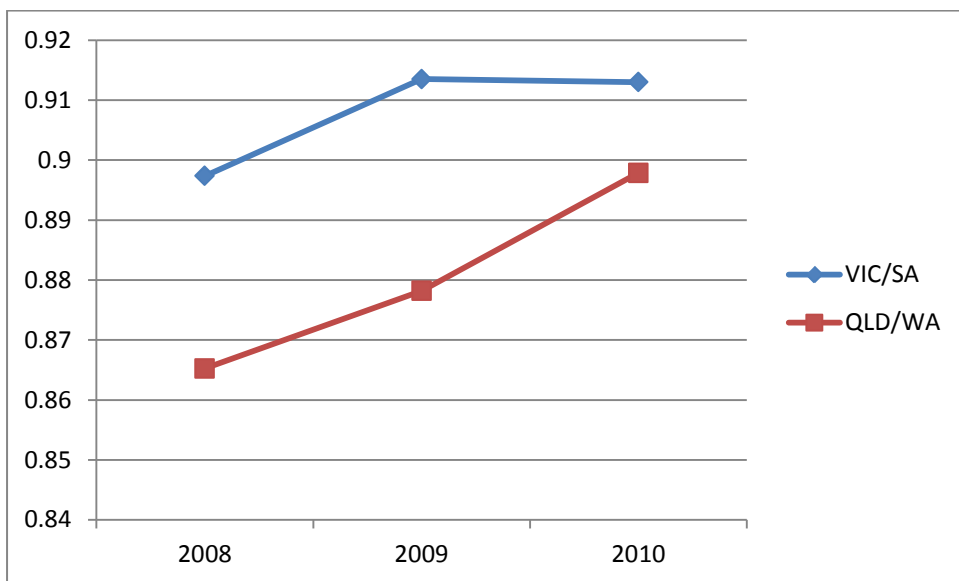


Figure A9. Proportion of senior doctors who stated "likely" or "very likely" to leave direct patient care within five years

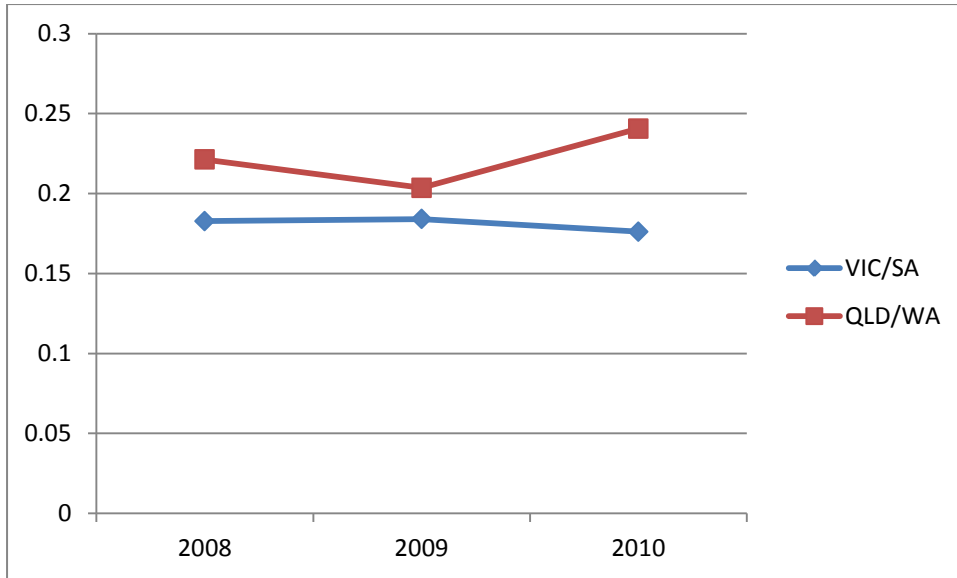


Figure A10. Proportion of senior doctors who stated "likely" or "very likely" to leave medical work entirely within five years

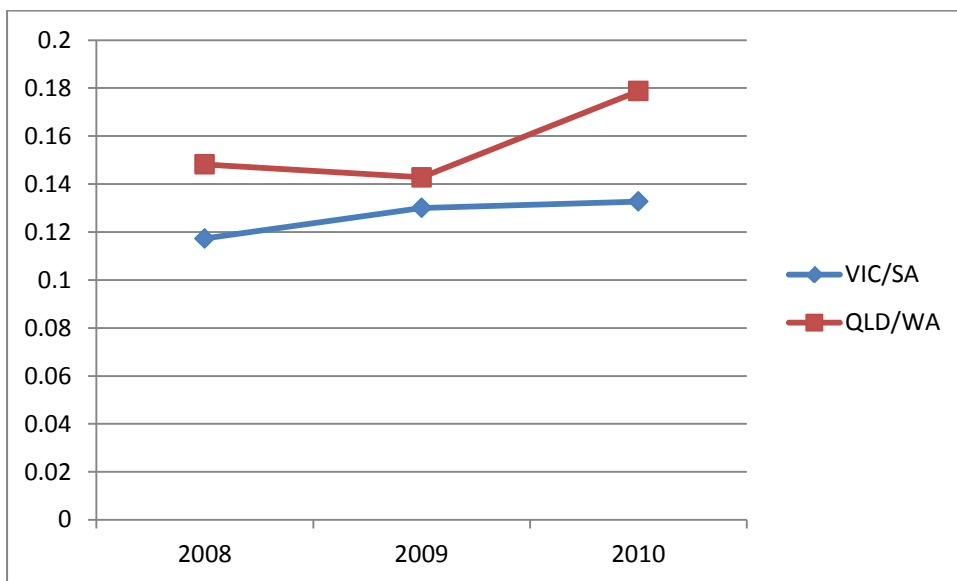


Figure A11. The proportion of junior doctors providing after-hours on-call services

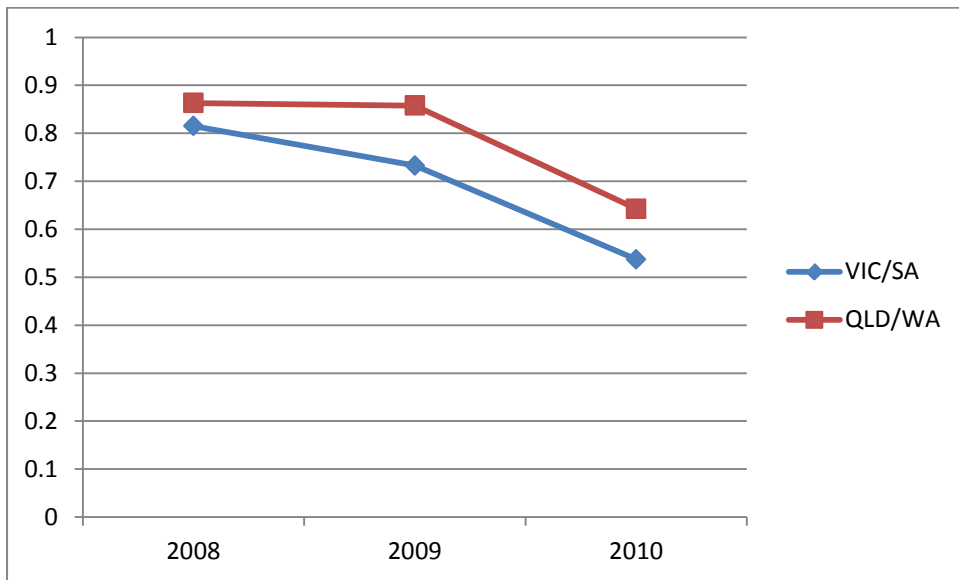


Figure A12. Actual number of times junior doctors providing on-call services in the last usual week at work

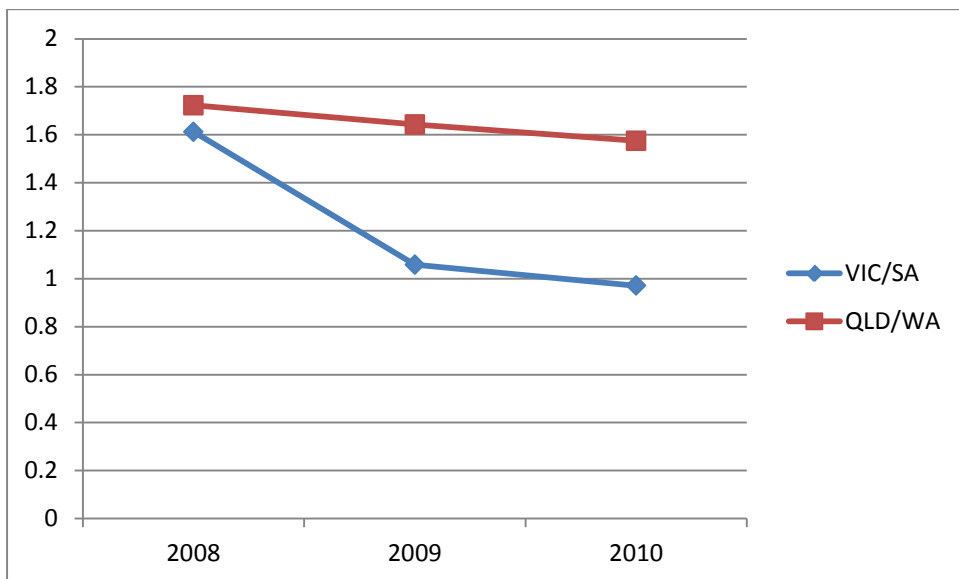


Figure A13. The number of weeks holiday taken; junior doctors

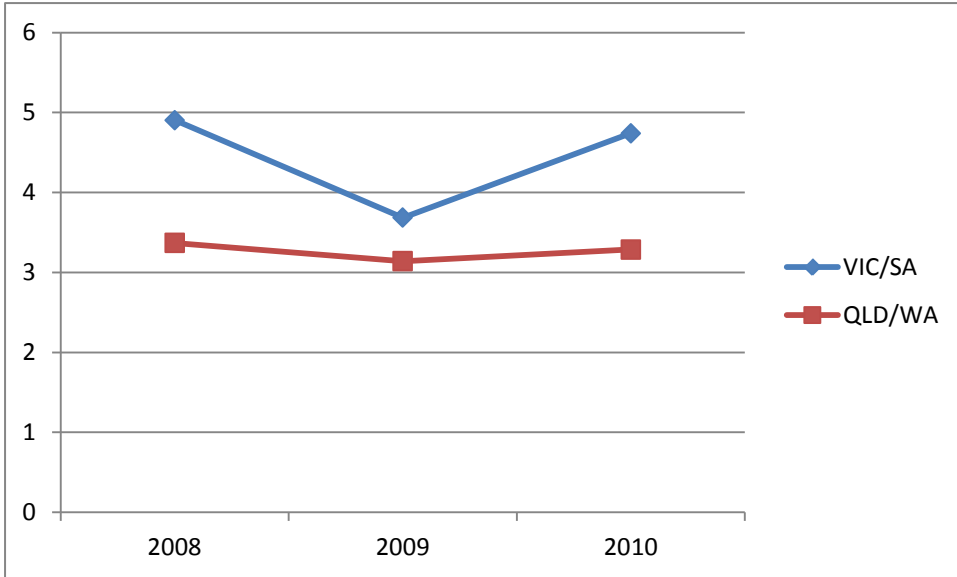


Figure A14. Proportion of junior doctors agreeing with the statement 'It is difficult to take time off work when I want to'

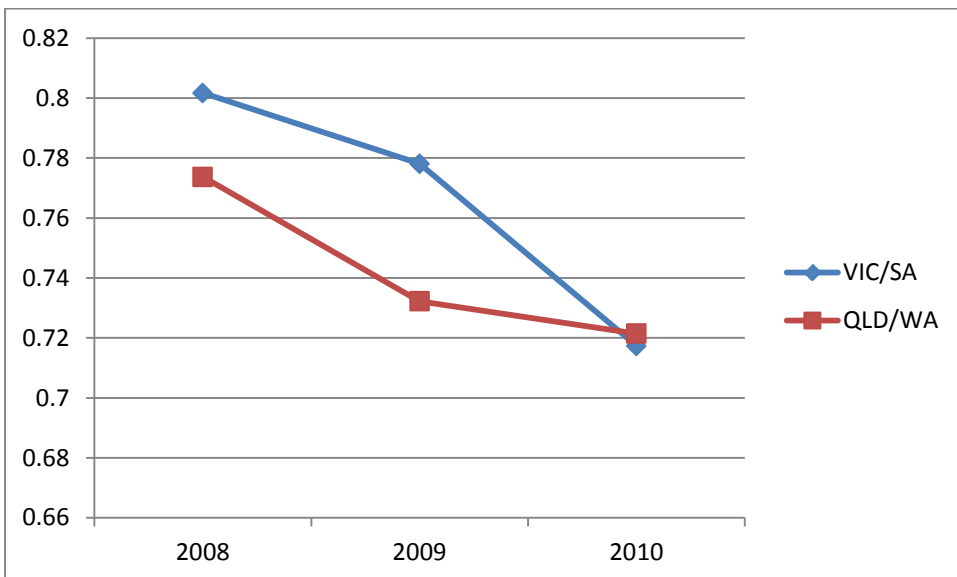


Figure A15. Proportion of junior doctors moderately or very satisfied with freedom to choose own method of working

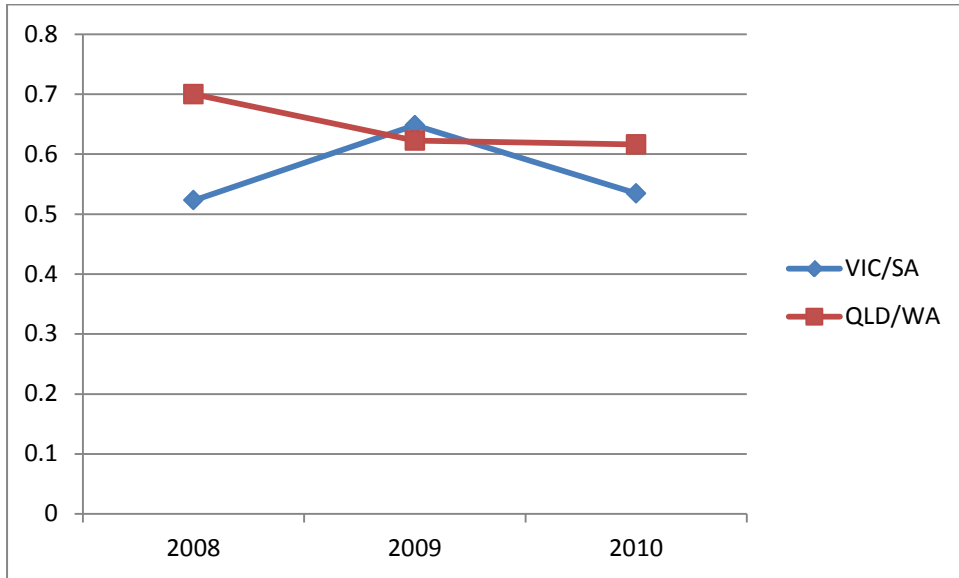


Figure A16. Proportion of junior doctors who stated "likely" or "very likely" to leave direct patient care within five years

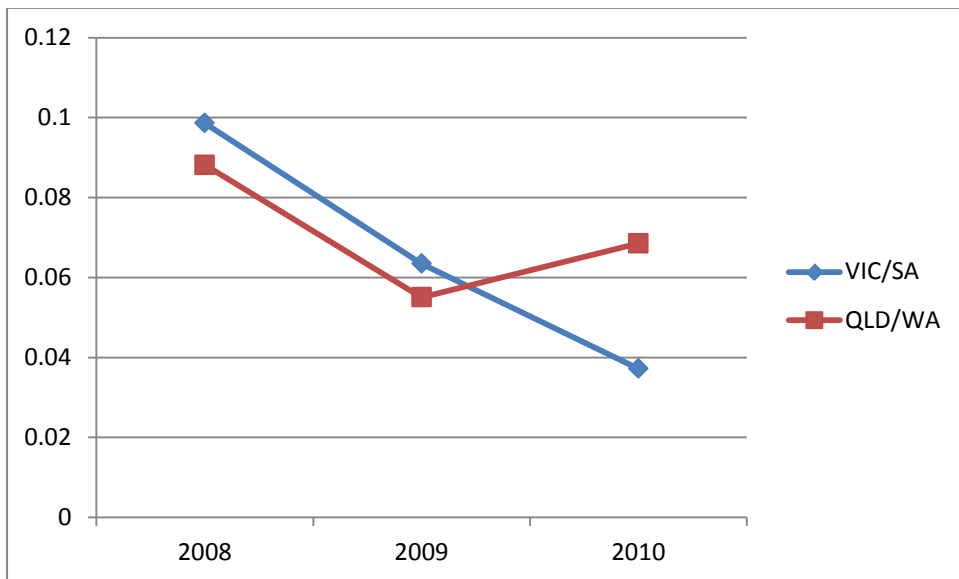


Figure A17. Proportion of junior doctors who stated "likely" or "very likely" to leave medical work entirely within five years

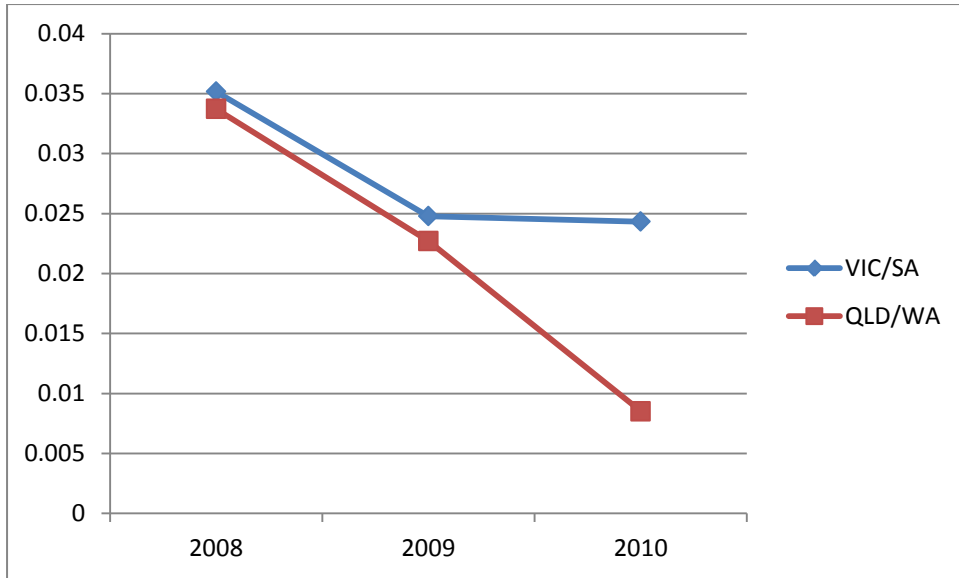


Figure A18. The proportion of specialist registrars providing after-hours on-call services

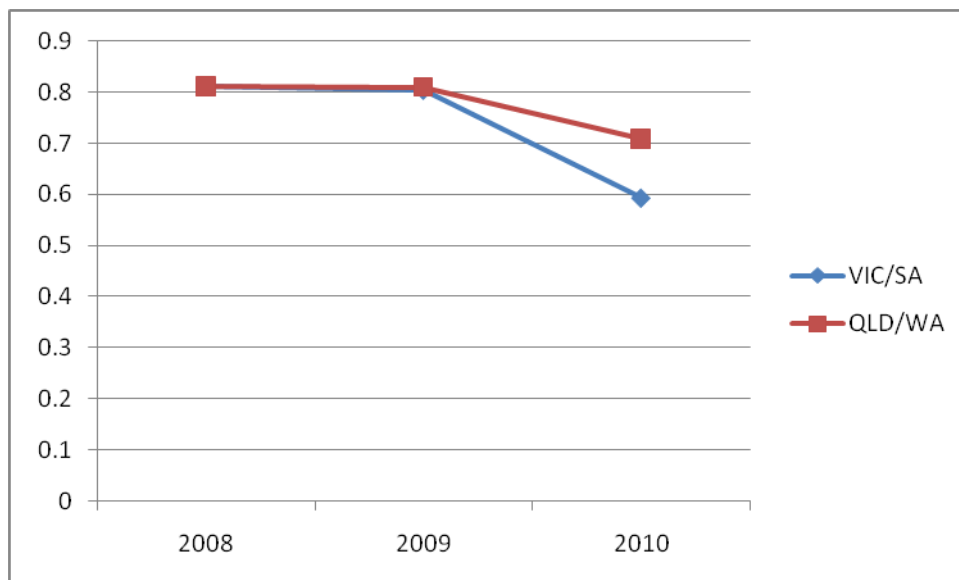


Figure A19. Actual number of times specialist registrars providing on-call services in the last usual week at work

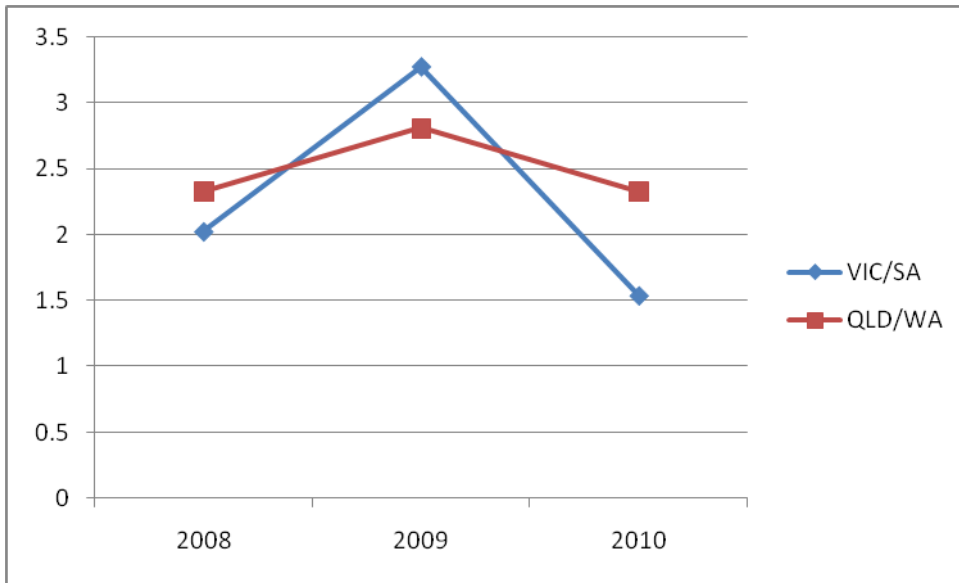


Figure A20. The number of weeks holiday taken; specialist registrars

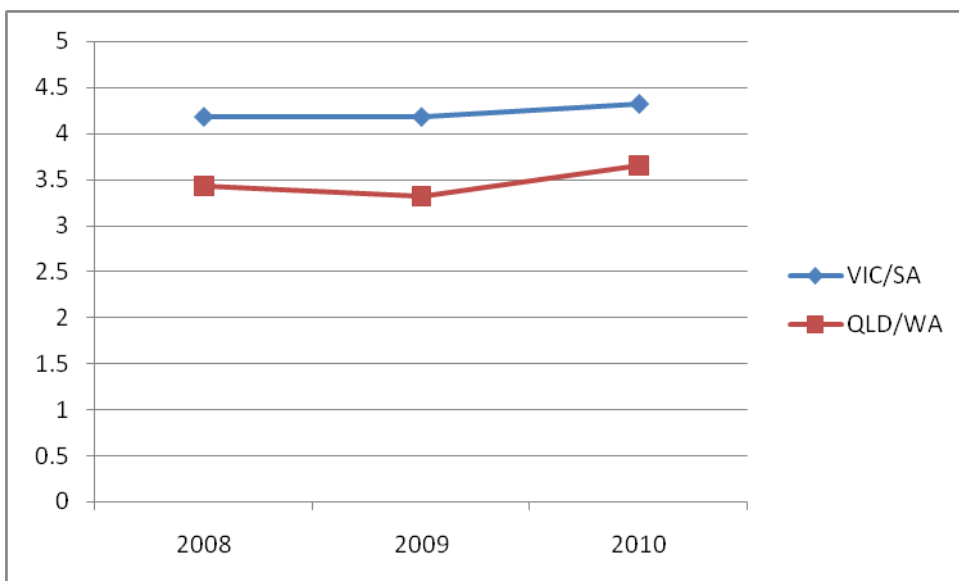


Figure A21. Proportion of specialist registrars agreeing with the statement 'The balance between my personal professional commitments is about right'

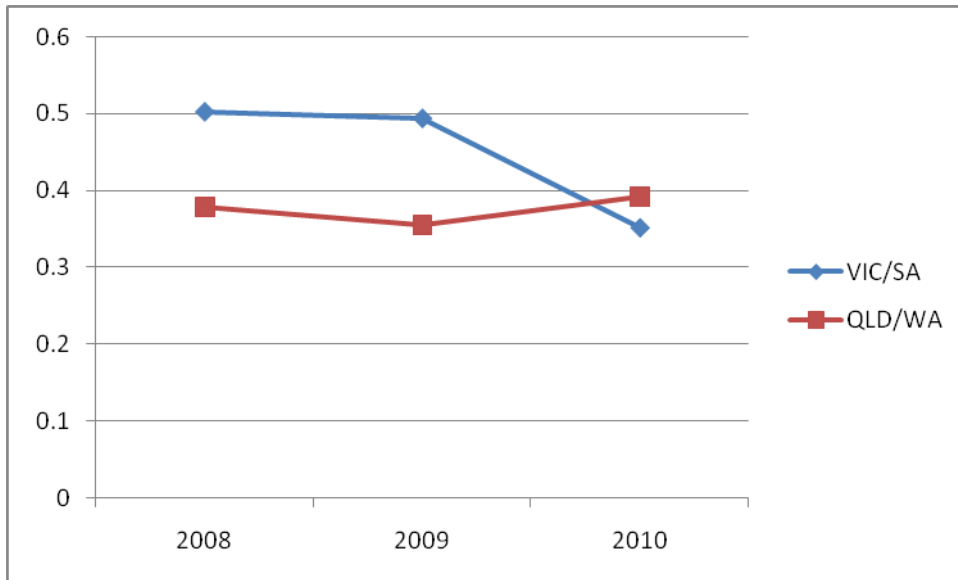


Figure A22. Proportion of specialist registrars agreeing with the statement 'It is difficult to take time off work when I want to'

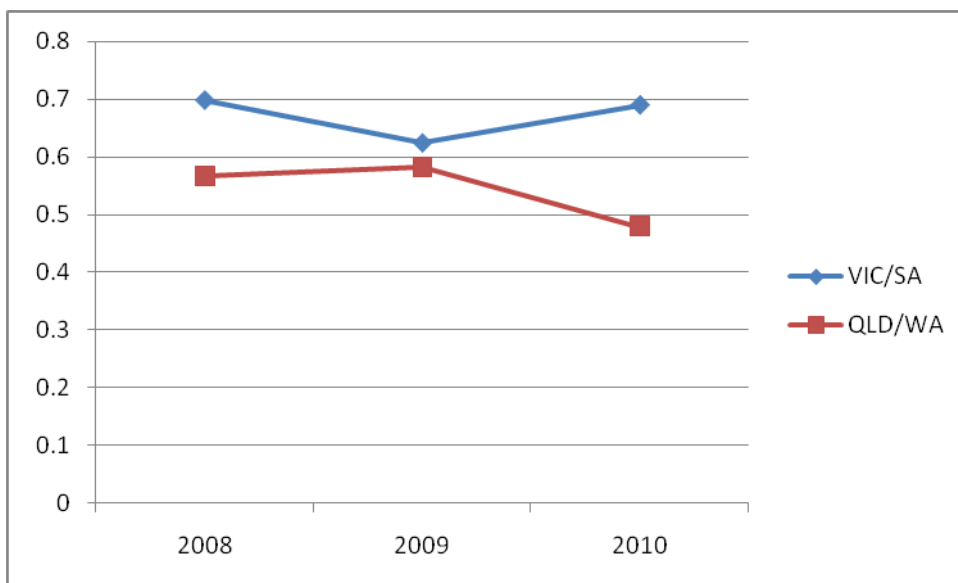


Figure A23. Proportion of specialist registrars moderately or very satisfied with their jobs overall

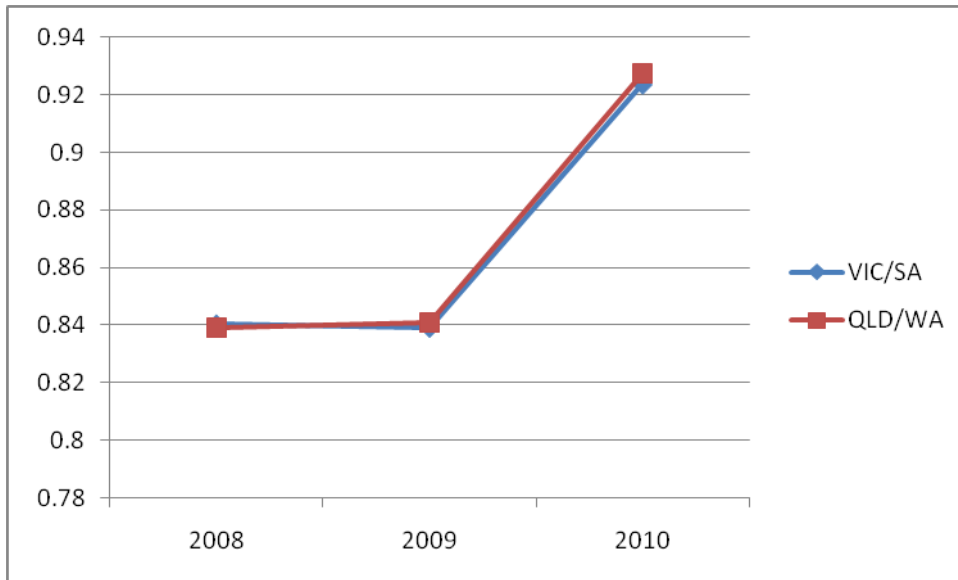


Figure A24. Proportion of specialist registrars moderately or very satisfied with amount of responsibility given

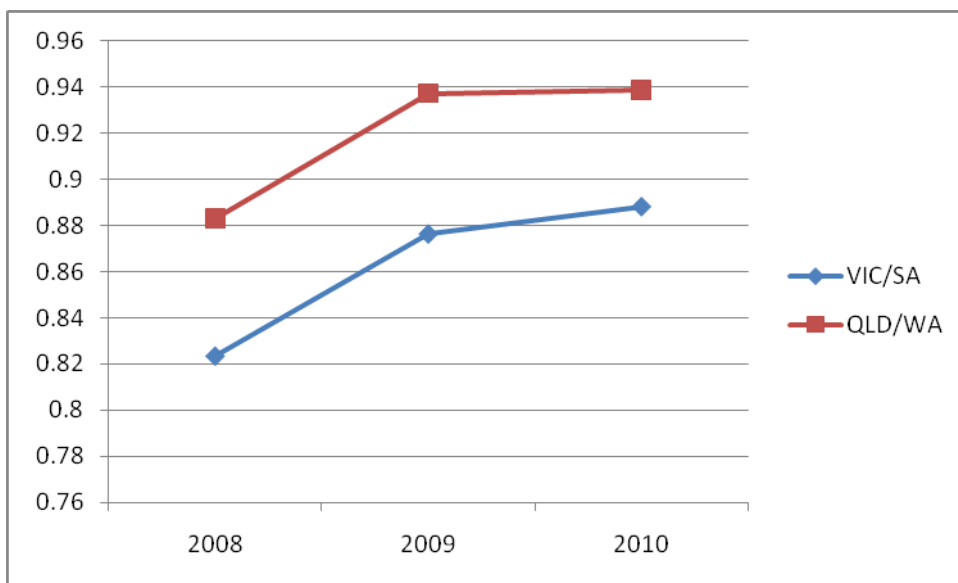


Figure A25. Proportion of specialist registrars moderately or very satisfied with freedom to choose own method of working

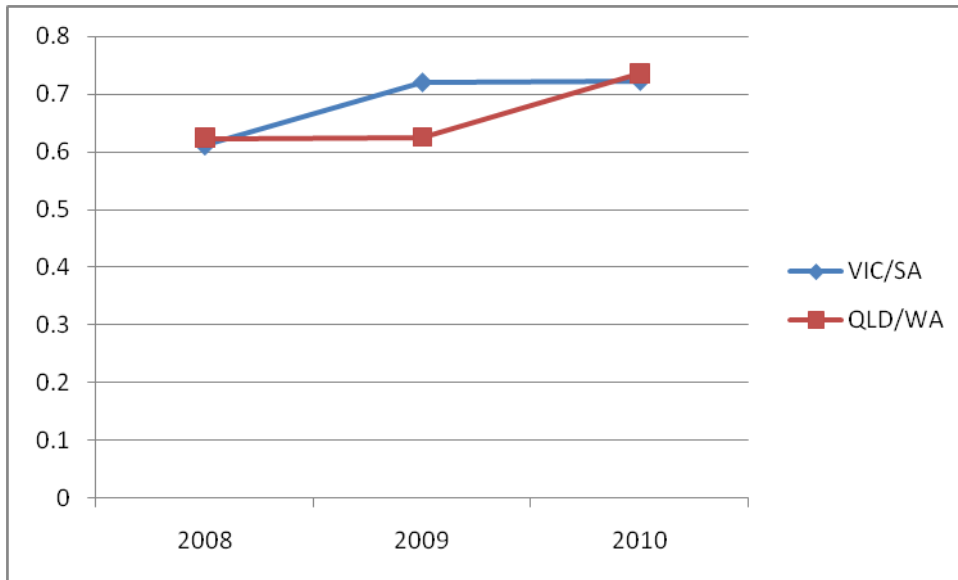


Figure A26. Proportion of specialist registrars who stated "likely" or "very likely" to leave direct patient care within five years

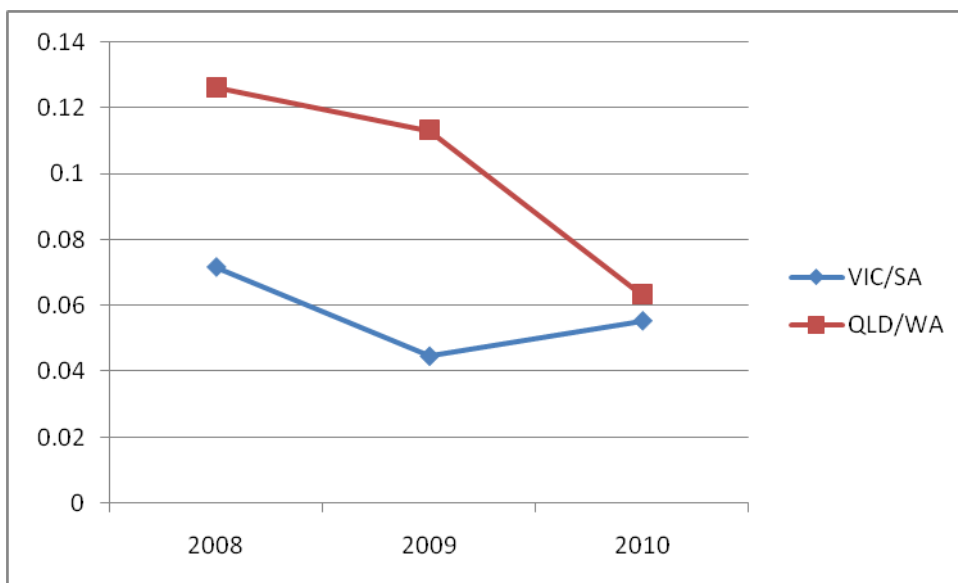
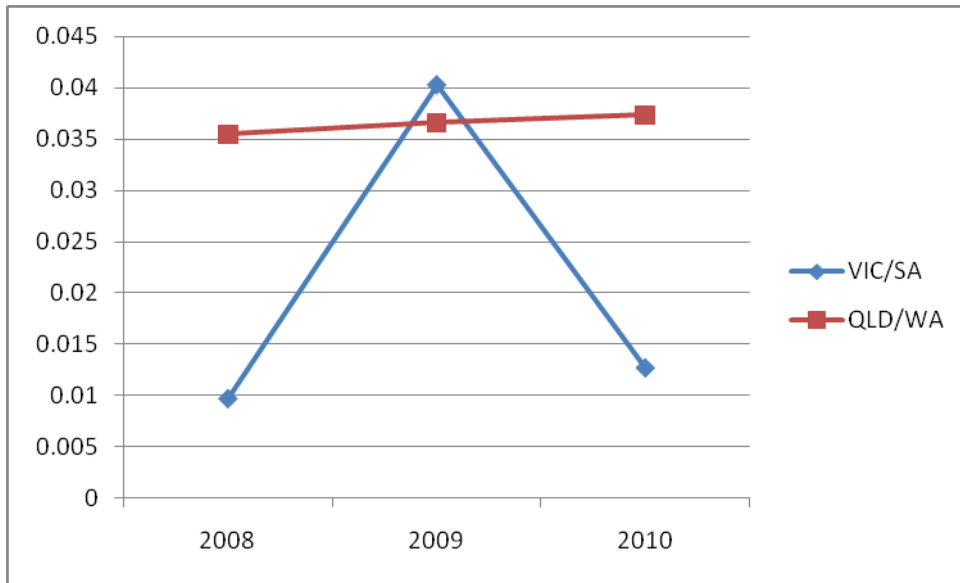


Figure A27. Proportion of specialist registrars who stated "likely" or "very likely" to leave medical work entirely within five years



Appendix 3. Medical graduate expansion analysis using AIHW Labour Force Survey data

Methods

We examine the short term effects on working patterns using data from the AIHW Medical Labour Force Survey for the period from 2004 to 2009 (3 years before 2007 and 2 years after). The data contain a much smaller range of key outcomes compared to MABEL including total working hours, proportion of hours spent in direct patient care and proportion of hours spent in teaching and supervision. Some evidence on the short term effects on working patterns is provided in the Figures below. All the results below are weighted by the cross sectional weights designed by the AIHW Labour Force Survey so that the descriptive statistics are nationally representative for each year.

Are more specialists involved in training pre-vocational trainees?

The AIHW Medical Labour Force survey included a question for all types of medical doctors asking about the total hours per week spent working as a teacher or educator. In most of the states or territories surveys, this question specifies that they should count the hours during which they were primarily responsible for training/educating other health professionals and exclude the time spent on their own continuing education.

Figure A28 shows that the proportion of specialists involved as a teacher or educator is higher in VIC/SA than in QLD/WA for all years. The figures show that there is an increase of 2.3 percentage points in the proportion of specialists spending at least some time per week as a teacher or educator between 2008 and 2009 in VIC/SA, and there is an increase of 3.4 percentage points in this proportion in QLD/WA in the same period. Figure A29 shows the same data for GPs and indicate a similar trend though the magnitude of increase is smaller, with an increase of 1.2 percentage points in VIC/SA and an increase of 1.8 percentage points in QLD/WA.

Comparison to MABEL data. Though the questions asked are different (MABEL focuses specifically on involvement with pre-vocational trainees) and cover different time periods (MABEL uses data from 2009 to 2010), the differences between the trends are similar: i.e. a larger percentage increase in QLD/WA than in VIC/SA.

Figure A28. Proportion of specialists who spent at least some time per week as a teacher or educator

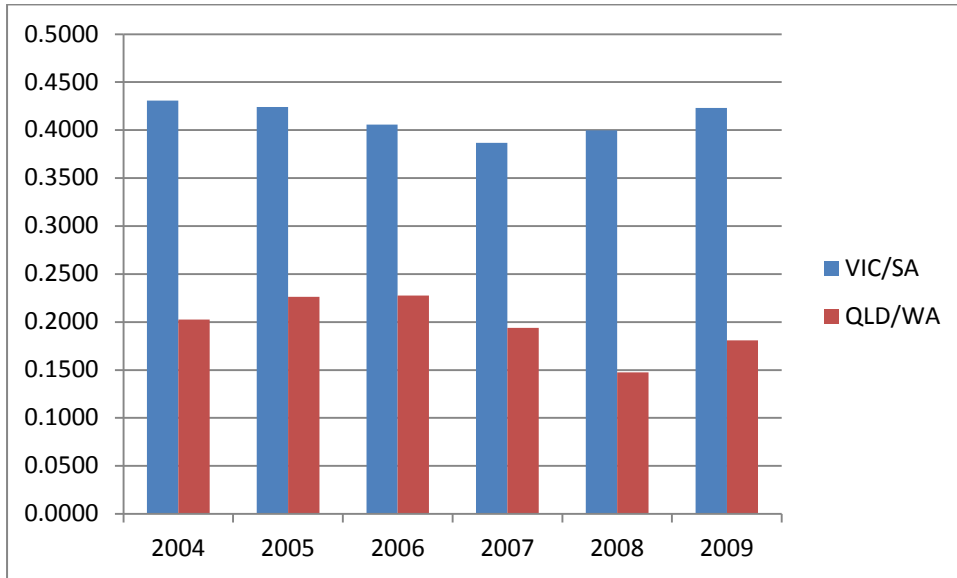
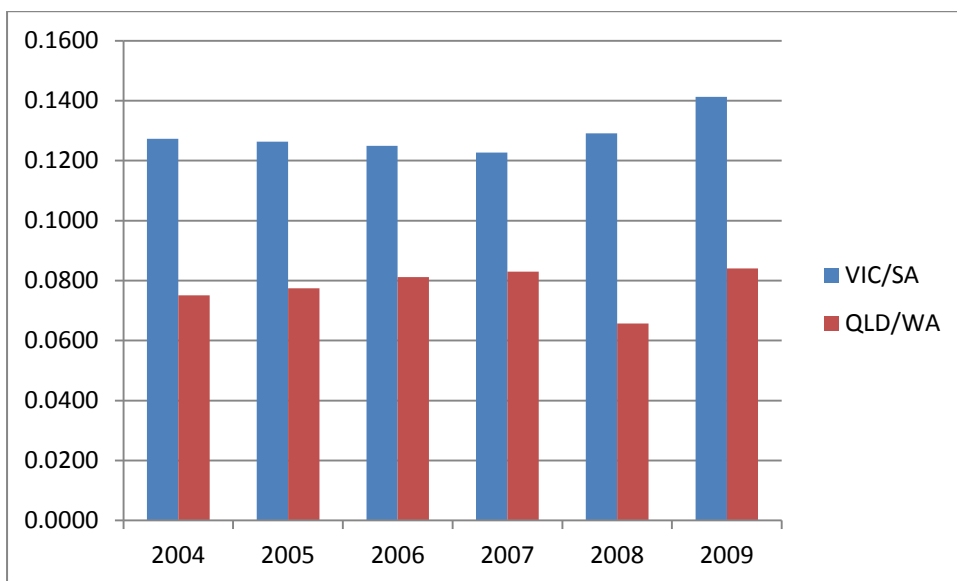


Figure A29. Proportion of GPs who spent at least some time per week as a teacher or educator



The effects of expansion on senior doctors

The set of figures in this section are for senior doctors (specialists) who indicated in the survey that they spent at least some time per week as a teacher or educator. Figure A30 shows that the total working hours are in general declining over the period of 2004-2009. But between 2008 and 2009, the total working hours of senior doctors declined in VIC/SA while increased in QLD/WA. Figure A31 shows that the proportion of hours spent in direct patient care has declined in both groups, but the size of the decrease has been higher for doctors in QLD/WA. The proportion of hours spent in teaching is slightly increasing over time in general and this trend is very similar across QLD/WA and VIC/SA (Figure A32).

Figure A30. Total hours worked; senior doctors who spent at least some time per week as a teacher or educator

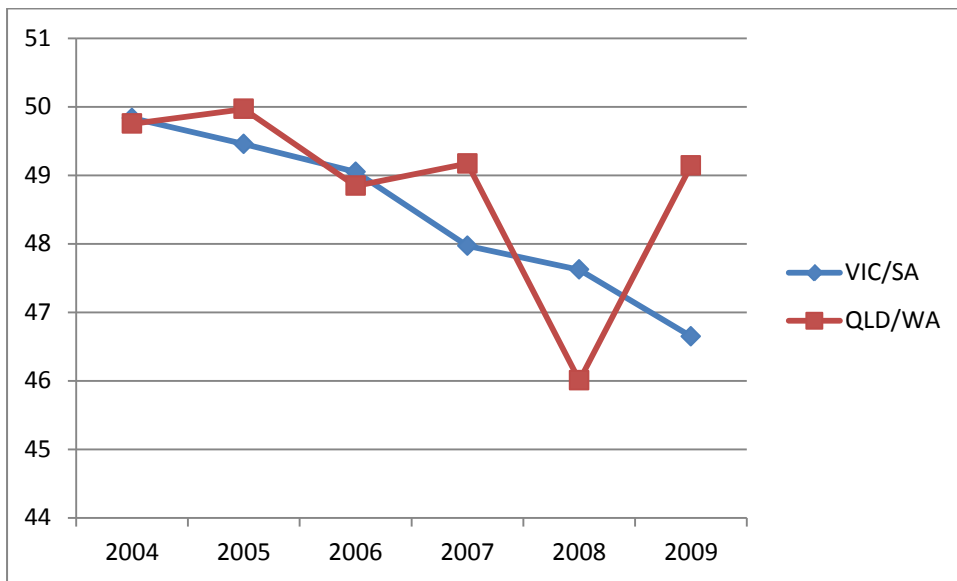


Figure A31. The proportion of hours spent in direct patient care; senior doctors who spent at least some time per week as a teacher or educator

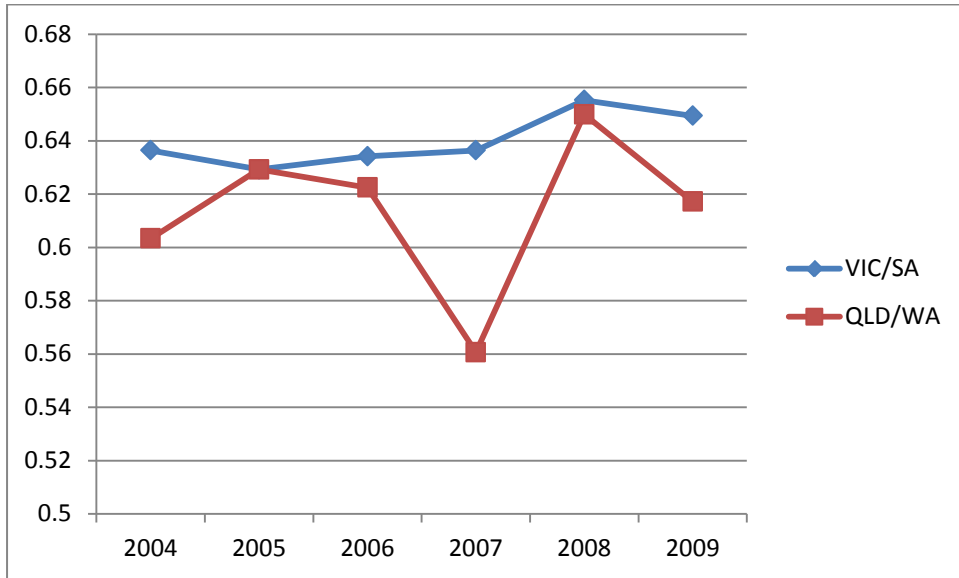
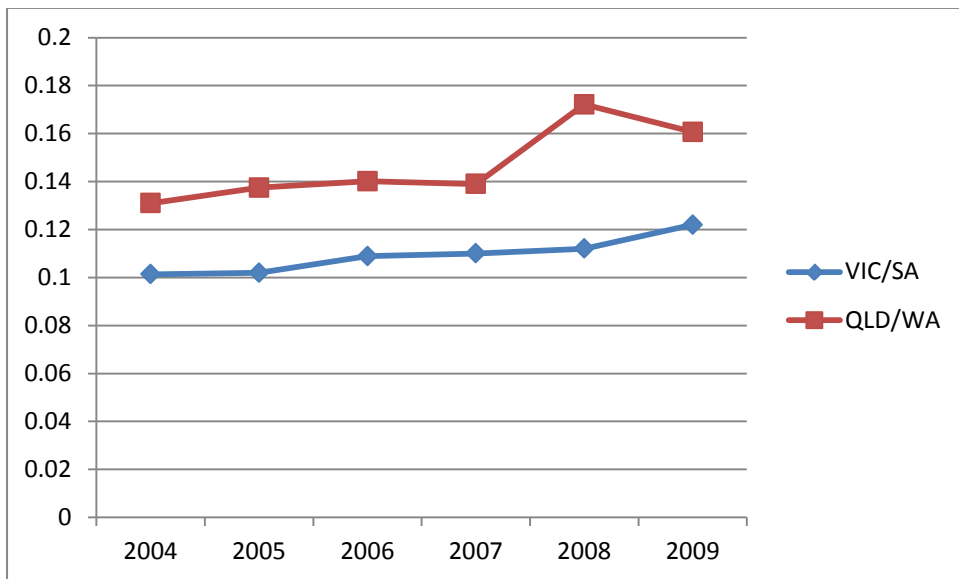


Figure A32. The proportion of hours spent in teaching; senior doctors who spent at least some time per week as a teacher or educator



The effects of expansion on junior doctors

We also examined the working patterns of junior doctors from 2004 to 2009. These are doctors who identified themselves as interns, or hospital medical officers year 1 and hospital medical officer year 2. Total working hours for junior doctors are also declining over year in general (Figure A33). The rate of decline is slightly slower in QLD/WA than in VIC/SA. Figure A34 shows that the proportion of hours spent in direct patient care hasn't been changing substantially over time, and the trend of the proportion is very similar across both groups. Figure A35 shows that the proportion of hours spent as a teacher or educator increased dramatically between 2008 and 2009. This does not mean that junior doctors spent more time in their education because in the AIHW Labour Force Survey this question seems more relevant to hours spent in the doctor's own education activities (see Appendix 1).

Figure A33. Total hours worked; junior doctors

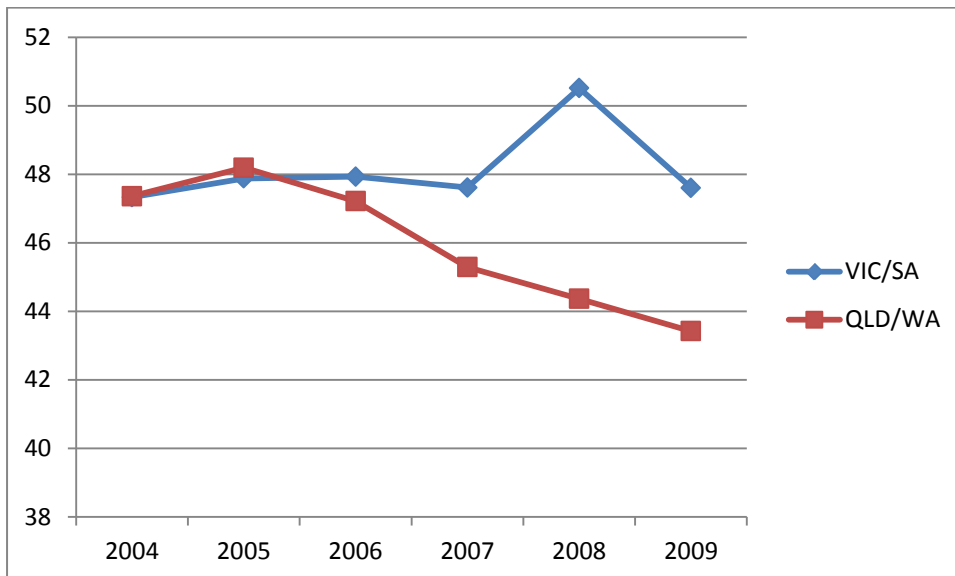


Figure A34. The proportion of hours spent in direct patient care; junior doctors

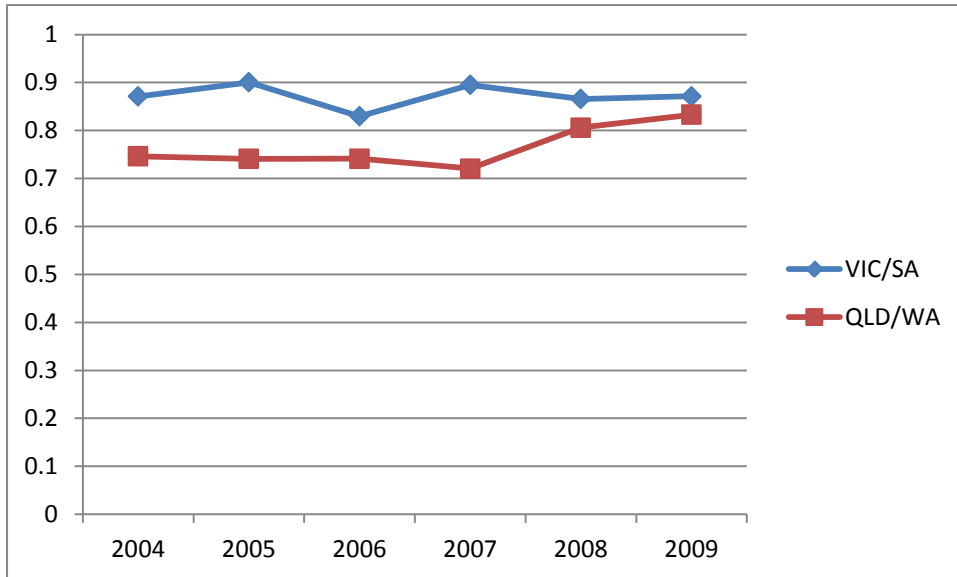
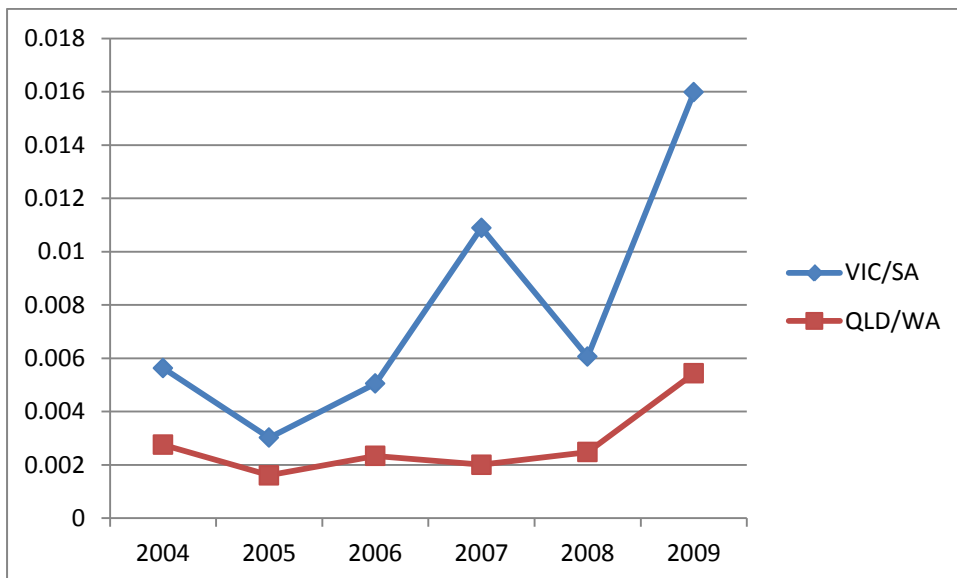


Figure A35. The proportion of hours spent as a teacher or educator; junior doctors



The effects of expansion on specialist registrars

Senior doctors may be unaffected by the medical graduate expansion if the additional supervisory responsibilities are delegated to registrars. In order to test this hypothesis, we examined the working patterns of specialist registrars from 2004 to 2009 using the AIHW data. These are doctors who identified themselves as specialist-in-training or specialist registers as for their practice type and also reported that they spent at least some time per week as a teacher or educator.

Figure A36 shows the proportion of specialist registrars involved in teaching is higher in VIC/SA than in QLD/WA for all years. The figure also shows that there is a slight increase of 1 percentage point in the proportion of specialist registrars spending at least some time per week as a teacher or educator between 2008 and 2009 in VIC/SA, but there is a decrease of 1.7% percentage points in this proportion in QLD/WA in this period.

There was little evidence of an effect on total working hours for specialist registrars. Total working hours is declining between 2008 and 2009 for both groups, but the trend of the decline is very similar across both groups (Figure A37). Figure A38 and Figure A39 show that there is little change in the proportion of hours spent in direct patient care and in the proportion of hours spent as a teacher or educator for both QLD/WA and VIC/SA and the trends for these proportions are similar across both groups. These figures suggest that we don't really observe the delegation of the additional supervisory responsibilities from specialists to specialist registrars.

Figure A36. Proportion of specialist registrars who spent at least some time per week as a teacher or educator

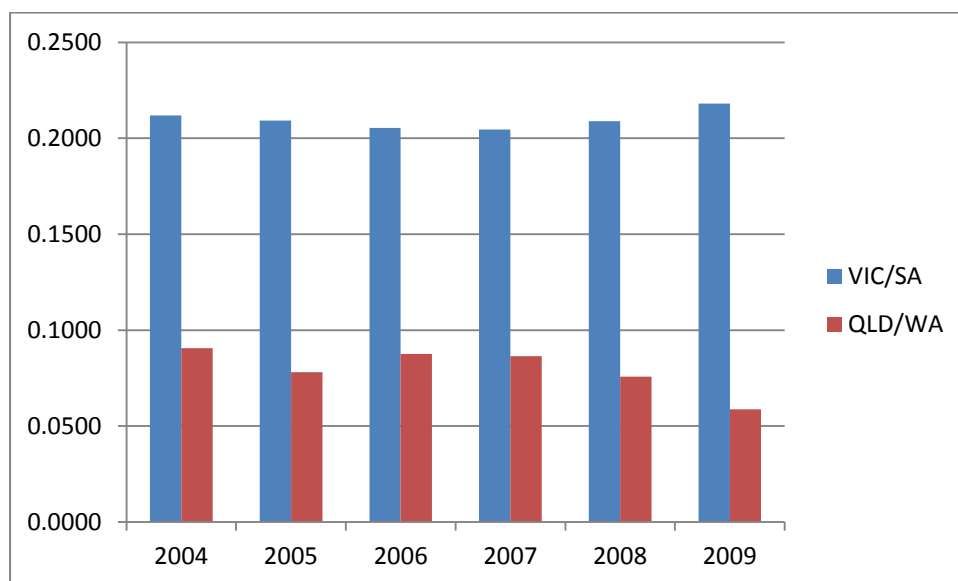


Figure A37. Total hours worked (AIHW data); specialist registrars

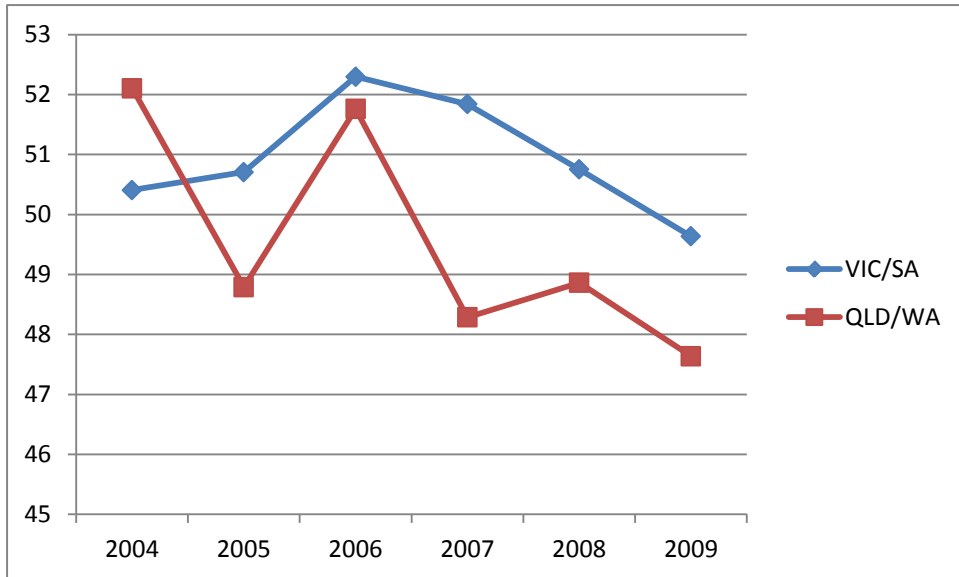


Figure A38. The proportion of hours spent in direct patient care (AIHW data); specialist registrars

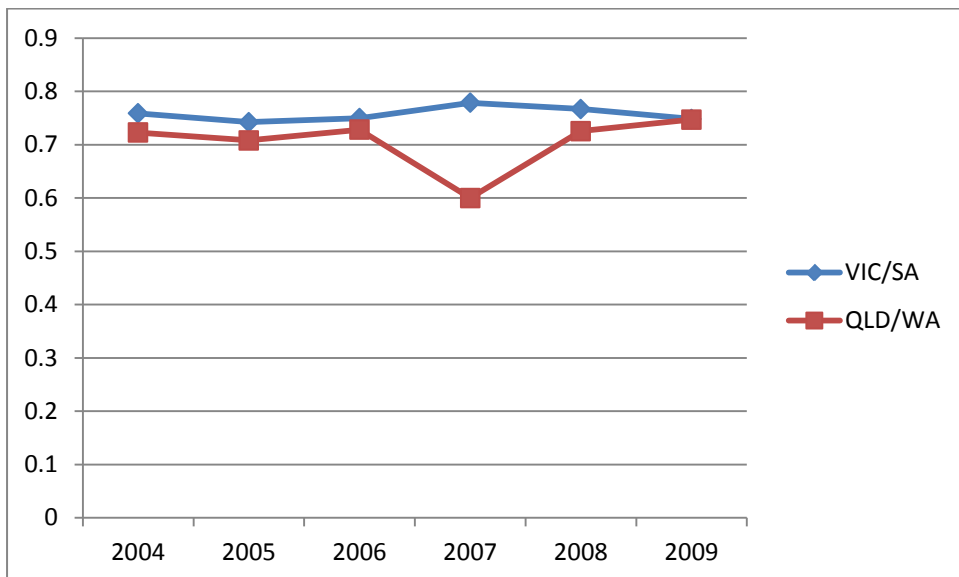
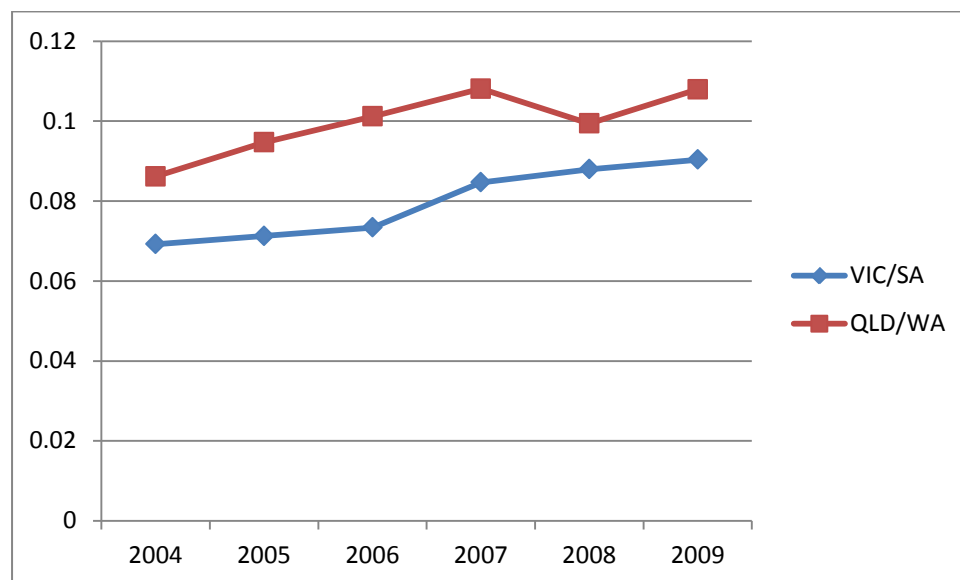


Figure A39. The proportion of hours spent as a teacher or educator (AIHW data); specialist registrars



The geographical diffusion of junior doctors

A further way of examining whether graduate expansion has had an effect on working patterns is to examine the geographical location of junior doctors. Working patterns are more likely to be affected if junior doctors remain in traditional teaching hospital environments. An increased concentration of junior doctors in these hospitals may cause issues with supervision and the quality of training. However, if junior doctors are training in new locations, such as non-metropolitan areas, then the effects on working patterns are likely to be less pronounced.

Table A1 presents the distribution of junior doctors in our study sample in different categories of remoteness based on AMPCo data on the population of doctors. The table shows that for junior doctors, the proportion of junior doctors practicing in major cities increased only slightly, by 1.1 percentage points for QLD/WA between 2008 and 2010, while the proportion decreased by about 1.3 percentage points for VIC/SA.

Even though the absolute number of junior doctors increased in major cities for QLD/WA, it will not affect the teaching quality or workload if there are proportionally more specialists or specialist registrars in metro areas. Table A2 presents the change in the ratio of junior doctors as a percentage of the whole number of non-GPs by ASGC remoteness over the first three

years of AMPCo data. It shows that the ratio of junior doctors to the total number of non-GPs has increased only slightly, 0.9 percentage points in QLD/WA, compared to a decrease of 0.43 percentage points in VIC/SA.

We focus only on interns in Tables A3 and A4. This shows that the proportion of interns in major cities has increased by 2.17 percentage points between 2008 and 2010 in QLD/WA. There is also some evidence that is increased in VIC/SA as well. Table A4 shows the proportion of interns to all non-GPs has increased across most geographical areas: by 6.7 percentage points in major cities; 6.6 percentage points in inner regional areas, and by 4.8 percentage points in outer regional areas.

AIHW data show the change from 2007 to 2008 (Table A5), so do not cover the period of most interest, after 2009. This shows that the proportion of junior doctors in major cities in QLD/WA fell by 6.7% percentage points, and increased in outer regional areas by 4.5 percentage points. There were few changes in VIC/SA. The ratio of junior doctors to all non-GPs increased by a small amount in major cities, by 0.27 percentage points, and by a larger amount in outer regional areas, 2.46 percentage points (Table A6).

Table A1. Number and percentage of junior doctors (all interns and medical officers) in different categories of remoteness (AMPCo data)

	QLD/WA			VIC/SA		
	2008	2009	2010	2008	2009	2010
[1] Major city	1,837	1,945	2,102	2,626	3,033	2,943
%	82.01	82.07	83.12	94.12	92.95	92.81
[2] Inner regional	231	226	232	148	204	200
%	10.31	9.54	9.17	5.3	6.25	6.31
[3] Outer regional	121	134	134	15	25	27
%	5.4	5.65	5.3	0.54	0.77	0.85
[4] Remote	32	38	39	1	1	1
%	1.43	1.6	1.54	0.04	0.03	0.03

[5] Very remote	19	27	22			
%	0.85	1.14	0.87			
Total	2,240	2,370	2,529	2,790	3,263	3,171
%	100	100	100	100	100	100

Table A2. Percentage of junior doctors as a proportion of all non-GPs in the population by ASGC remoteness (AMPCo data)

	QLD/WA			VIC/SA		
	2008	2009	2010	2008	2009	2010
[1] Major city	25.38	25.56	26.28	25.18	26.20	24.75
[2] Inner regional	31.13	29.54	27.72	21.64	25.37	24.07
[3] Outer regional	29.37	29.84	29.45	19.48	24.27	25.23
[4] Remote	58.18	70.37	73.58	33.33	25.00	25.00
[5] Very remote	90.48	90.00	100.00	NA	NA	NA

Table A3. Distribution of the population of junior doctors (Interns only) in different categories of remoteness (AMPCo data)

	QLD/WA			VIC/SA		
	2008	2009	2010	2008	2009	2010
[1] Major city	161	454	715	419	436	
%	84.29	85.34	86.46	94.8	96.89	
[2] Inner regional	20	53	78	21	14	
%	10.47	9.96	9.43	4.75	3.11	
[3] Outer regional	10	25	33	2	0	
%	5.24	4.7	3.99	0.45	0	

[4] Remote	0	0	1		
%	0	0	0.12		
Total	191	532	827	442	450
%	100	100	100	100	100

Table A4. Percentage of junior doctors (interns only) as a proportion of all non-GPs in the population by ASGC remoteness (AMPCo data)

	QLD/WA			VIC/SA		
	2008	2009	2010	2008	2009	2010
[1] Major city	2.22	5.97	8.94		3.62	3.67
[2] Inner regional	2.70	6.93	9.32		2.61	1.68
[3] Outer regional	2.43	5.57	7.25		1.94	0.00
[4] Remote	0.00	0.00	1.89		0.00	0.00

Table A5. Distribution of junior doctors in different categories of remoteness: AIHW data

	QLD/WA					VIC/SA				
	2004	2005	2006	2007	2008	2004	2005	2006	2007	2008
[1] Major city	369	434	397	444	458	313	293	410	364	365
%	64.85	74.57	65.51	66.77	60.03	89.94	90.43	92.34	90.32	90.12
[2] Inner regional	58	58	59	72	75	11	13	18	23	23
%	10.19	9.97	9.74	10.83	9.83	3.16	4.01	4.05	5.71	5.68
[3] Outer regional	63	60	72	71	116	2	2	8	6	8
%	11.07	10.31	11.88	10.68	15.2	0.57	0.62	1.8	1.49	1.98
[4] Remote	3	3	4	5	10	0	0	0	1	0
%	0.53	0.52	0.66	0.75	1.31	0	0	0	0.25	0
[5] Very remote	4	6	5	6	8	0	0	0	0	1
%	0.7	1.03	0.83	0.9	1.05	0	0	0	0	0.25
Missing values	72	21	69	67	96	22	16	8	9	8
%	12.65	3.61	11.39	10.08	12.58	6.32	4.94	1.8	2.23	1.98
Total	569	582	606	665	763	348	324	444	403	405

% 100 100 100 100 100 100 100 100 100 100

Table A6. Percentage of junior doctors as a proportion of all non-GPs, by ASGC remoteness: AIHW data

	QLD/WA					VIC/SA				
	2004	2005	2006	2007	2008	2004	2005	2006	2007	2008
[1] Major city	8.43	9.10	8.96	9.18	9.45	4.34	4.03	5.08	4.56	4.63
[2] Inner regional	11.51	11.18	11.22	12.72	11.77	1.92	2.25	2.83	3.58	3.41
[3] Outer regional	9.94	9.63	11.25	11.45	13.91	1.39	1.69	6.67	5.22	6.30
[4] Remote	13.04	12.00	12.12	12.50	23.26	0.00	0.00	0.00	9.09	0.00
[5] Very remote	6.15	7.23	9.62	6.67	8.89	0.00	0.00	0.00	0.00	20.00

Comparing the results from MABEL and AIHW data

Comparing the results with those based on MABEL data, we found large discrepancies in both the magnitude and the trend for the three key outcomes for year 2008- 2009. This can be due to two sources of difference between these two data sets.

First, it is possible that the survey questions or the wording of the survey questions related to the three key outcomes are different across the two data sets. We contrast the survey questions between the AIHW and the MABEL data in Table A7. There are a few differences in wording for the working hour questions across different states or territories for the AIHW data. Particularly, in Queensland the survey questions about working hours are different in design from the other states (WA, SA and VIC). The working hours on each activity are based on the reported working hours for the main, second job and third job in the questionnaire administered in QLD, while there is a direct question asking about hours spent on each activity (including direct patient care and teacher/educator) in the questionnaires administered in WA, SA and VIC. The working hour questions are consistent across different states/ territories for the MABEL data, but the wording for the same questions slightly varies across different waves (Table A7).

Second, it is possible that the scope and coverage of the survey or the response rates for the AIHW data and for the MABEL data are different. In general, the Labour Force Survey is undertaken in association with the registration renewal process. As such, only practitioners who are on the register at the time of the survey, and who are required to renew their registration receive a questionnaire for completion, regardless of their type of registration (conditional or general). Medical practitioners registering for the first time or who are not required to renew their registration in the survey year are not surveyed. However, the AIHW Labour Force Survey did not cover the whole population of all registered medical practitioners in some of the states for some years (details see Table A8). For instance, from 2002 to 2005, Western Australia registration data was based on general registrants only, whereas the survey was distributed to general and conditional registrants.

Also, the response rates for some of the states in certain years can be relatively lower than the other states for both data sets. The response rates for the AIHW data are significantly higher than those for the MABEL data. For the years 2004-2009 in AIHW data, the estimated response rates range from 31.9% to 87.5% for different states (see Table A9). But the response rates for MABEL data are around 20% for all three waves for both QLD/WA and VIC/SA. The weighting process designed for MABEL data is more comprehensive than the weights designed for AIHW data.

Table A7. Questions about key outcomes in MABEL and AIHW data

AIHW questions

States (T/C)	Total hours worked	Total hours in direct patient care	Hours worked as teacher
QLD (T)	<p>Derived</p> <p>Please indicate how many hours worked LAST WEEK. For hours worked exclude the time spent on travel between work locations (except to home visit or other callouts) and exclude unpaid professional and/or voluntary activities. Indicate the main and 2nd and 3rd job in descending order of hours worked LAST WEEK.</p> <p>Total Hours excluding hours on call not worked</p> <p>Main job, 2nd job, 3rd job</p>	<p>Derived</p> <p>Please indicate how many hours worked LAST WEEK. For hours worked exclude the time spent on travel between work locations (except to home visit or other callouts) and exclude unpaid professional and/or voluntary activities. Indicate the main and 2nd and 3rd job in descending order of hours worked LAST WEEK.</p> <p>Direct patient care hours (including hours in scheduled patient sessions and other face to face or telephone consultations)</p>	<p>Derived</p> <p>LAST WEEK, in which field of medicine did you work? If you worked in more than one job in the field of medicine, please indicate a field for each position.</p> <p>Teacher/Educator</p> <p>Main job, 2nd job, 3rd job</p>
WA (T)	<p>How many hours did you work in medical jobs LAST</p>	<p>LAST WEEK, how many of the total</p>	<p>LAST WEEK, how many hours did you work in</p>

	<p>WEEK? <i>Exclude time spent on travel between work locations but include travel to home visits or other calls out. Exclude time spent on professional voluntary activities</i></p> <p>Total hours actually worked LAST WEEK</p> <p><i>(excluding hours on call not worked)</i></p>	<p>hours (in 17A above) involved direct contact with patients? <i>Include hours in scheduled patient sessions & other face-to-face or telephone consultations</i></p> <p><i>Exclude hours on call not worked</i></p>	<p>each of the following medical fields/roles/occupations?</p> <p>Teacher or educator: <i>(during these hours you were primarily responsible for training/educating other health professionals. Exclude time spent on your own continuing education)</i></p>
SA (C)	<p>How many hours did you work in medical jobs LAST WEEK? <i>Exclude time spent on travel between work locations but include travel to home visits or other calls out. Exclude time spent on professional voluntary activities</i></p> <p>Total hours actually worked LAST WEEK</p> <p><i>(excluding hours on call not worked)</i></p>	<p>LAST WEEK, how many of the total hours (in 17A above) involved direct contact with patients? <i>Include hours in scheduled patient sessions & other face-to-face or telephone consultations</i></p> <p><i>Exclude hours on call not worked</i></p>	<p>LAST WEEK, how many hours did you work in each of the following medical fields/roles/occupations?</p> <p>Teacher or educator: <i>(during these hours you were primarily responsible for training/educating other health professionals. Exclude time spent on your own continuing education)</i></p>
VIC (C)	<p>LAST WEEK, how many hours did you work in medical jobs?</p> <p><i>(Exclude time spent on travel between work locations, but include travel to home visits or other calls out. Exclude time spent on professional voluntary activities. Please estimate where exact figures are not</i></p>	<p>LAST WEEK, how many hours did you work in medical jobs?</p> <p><i>(Exclude time spent on travel between work locations, but include travel to home visits or other calls out. Exclude time spent on</i></p>	<p>LAST WEEK, how many hours did you work in each field of medicine?</p> <p>Teacher or educator</p>

	<p><i>known.)</i></p> <p>Total hours actually worked LAST WEEK (Excluding hours on call not worked.)</p> <p><i>Should be less than 100 hours.)</i></p>	<p><i>professional voluntary activities. Please estimate where exact figures are not known.)</i></p> <p>Hours in direct contact with patients LAST WEEK</p>	
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MABEL questions

Wave	Total hours worked	Total hours in direct patient care	Hours worked as teacher
Specialist			
Wave 1	Excluding after-hours and on-call , how many HOURS in your MOST RECENT USUAL WEEK at work did you spend on the following activities? (Include ALL of the work you do as a doctor in ALL jobs/workplaces)	Direct patient care (face-to-face, phone consultations, home visits: with or without a medical student present)	Education activities (teaching, research, continuing medical education)
Wave 2	Excluding after-hours and on-call , how many HOURS in your MOST RECENT USUAL WEEK at work did you spend on the following activities? (Include ALL of the work you do as a doctor in ALL jobs/workplaces) (If none, write 0)	Direct patient care (face-to-face, phone consultations, home visits: with or without a medical student)	Education activities (teaching, research, continuing medical education)

		present)	
Wave 3	Excluding on-call , for how many HOURS in your MOST RECENT USUAL WEEK at work did you undertake work in each of the following activities? (Include ALL of the work you do as a doctor in ALL jobs/workplaces) (if none, write 0)	Direct patient care (face-to-face, phone consultations, home visits: with or without a medical student present)	Education activities (teaching, research, continuing medical education)
Hospital non-specialist			
Wave 1	Excluding after hours on-call , how many HOURS in your MOST RECENT USUAL WEEK at work did you spend on the following activities? (Include ALL of the work you do as a doctor in ALL jobs/workplaces)	Direct patient care (face-to-face, phone consultations, home visits)	Education activities (academic research, continuing medical education)
Wave 2	Excluding after-hours and on-call , how many HOURS in your MOST RECENT USUAL WEEK at work did you spend on the following activities? (Include ALL of the work you do as a doctor in ALL jobs/workplaces) (If none, write 0)	Direct patient care (face-to-face, phone consultations, home visits)	Education activities (academic research, continuing medical education)
Wave 3	Excluding on-call , for how many HOURS in your MOST RECENT USUAL WEEK at work did you undertake work in each of the following activities? (Include ALL of the work you do as a doctor in ALL jobs/workplaces) (if none, write 0)	Direct patient care (face-to-face, phone consultations, home visits)	Education activities (academic research, continuing medical education)

Table A8. Response rates by states and territories for MABEL and AIHW data

MABEL response rates by states and territories, wave 1 to wave 3

	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
2008	19.46%	15.76%	39.18%	18.97%	19.51%	21.01%	22.63%	20.43%
2009	18.65%	14.87%	31.56%	17.65%	17.67%	19.88%	20.92%	19.05%
2010	17.93%	13.95%	28.27%	16.67%	17.38%	19.04%	19.08%	18.52%

Table A9. Medical Labour Force Survey: estimated response rates, states and territories, 1997–2009

	NSW ^(a)	Vic ^(b)	Old ^(c)	SA	WA ^(d)	Tas ^(e)	NT ^(f)	ACT ^(g)	Australia
1997	92.9	74.7	85.8	67.7	70.9	69.1	69.4	75.4	81.8
1998	94.2	75.4	85.3	64.9	63.3	71.7	61.6	68.3	81.3
1999	88.0	73.3	92.0	66.1	61.7	35.7	61.6	63.3	78.6
2000	82.0	67.4	73.7	73.5	59.6	68.2	59.8	65.4	73.2
2001	n.a.	63.9	76.8	71.3	36.4	65.4	60.3	71.6	64.5 ^(h)
2002	65.4	66.7	90.7	72.1	60.4	71.3	49.3	68.5	69.6
2003	76.5	66.0	81.3	68.6	61.7	64.6	38.8	70.6	71.4
2004	71.5	65.4	87.5	76.1	65.5	60.7	43.8	67.5	71.4
2005	72.4	68.6	83.8	69.9	66.6	62.0	31.8	67.1	71.3
2006	75.4	72.0	79.7	67.9	47.6	64.1	28.6	58.7	70.2
2007	84.3	68.8	64.3	63.5	54.2	59.4	27.1	64.9	69.9
2008	81.7	68.4	65.2	60.0	51.6	59.6	44.4	64.5	68.9
2009	79.1	40.3	31.9	62.8	42.8	46.1	37.3	62.5	53.1

(a) New South Wales response rates are based on responses to the Medical Labour Force Survey weighted to financial registrants holding general, conditional specialist, limited prescribing and referring or non-practising registration.

(b) From 2007 to 2009, Victoria surveyed only general, specific and provisional registered medical practitioners in the Medical Labour Force Survey but responses are weighted to all registered medical practitioners.

(c) From 2007 to 2009, Queensland response rate is based on responses to the 2007 Medical Labour Force Survey weighted to all registrants excluding some conditional registration types. From 2003 to 2006, responses to annual Medical Labour Force Surveys were weighted to general registrants and conditionally registered specialists only.

(d) For Western Australia, from 2006 to 2009, the scope was consistent, that is, the survey population and the benchmark figures are based on general and conditional registrants. From 2002 to 2005, survey was administered to both general and conditional registrants but benchmark figures were for general registrants only. For 2008 the benchmark used was the total number of registered practitioners in 2008 using 2007 age by sex proportions. For Western Australia in 2007, 2008 and 2009, the benchmark data includes a significant number of registered medical practitioners that are no longer active in the workforce. This inflates the perception of the medical labour force in Western Australia. It is also unknown how significantly past years have been affected. Care should be taken when interpreting these figures.

Sources: AIHW Medical Labour Force Surveys 1997 to 2009: Explanatory notes on the Medical Labour Force time series

Weighting procedure to adjust for non-response: AIHW data

Each survey record (a record equates to a respondent) has been assigned a weight which is calibrated to align with independent data on the population of interest, referred to as 'benchmarks'.

The calculation of weights is usually part of the data processing for a sample survey in which the sample is selected before the survey is conducted. In the Medical Labour Force Survey, all registered practitioners within the scope of the survey are sent a questionnaire when registration renewal is due. Therefore, technically, it is a census of medical practitioners. However, because not all renewing practitioners in scope respond, the result is a data set based on a very large 'self-selecting sample' of the population. As the group of respondents in the data set is not random, standard errors are not a suitable means of gauging variability.

The weight for each record is based on characteristics that are known for the whole population. The population benchmark data provided to the AIHW are the number of registered practitioners in each state and territory. These are provided to the AIHW by the state and territory Departments of Health. Where data are not available from the jurisdictions, benchmark figures are obtained from other sources, such as medical registration boards and their annual reports. In principle, a weight is based on the population number divided by the number in the responding sample. The resulting fraction becomes the expansion factor applied to the record, referred to as the 'weight', providing an estimate of the population when aggregate output is generated. For example, if a quarter of the target population in the under 25 year age group responded and half of the target population in the 25–29 year age group responded, then the estimates for the under 25 year age group would be scaled up by a factor of 4 and the estimates for the 25–29 year age group would be scaled up by a factor of 2.

Producing estimates for the population by weighting the data from respondents adjusts for bias in the responding group of practitioners for known population characteristics (age and sex, where provided, in the case of the Medical Labour Force Survey).

Sources: AIHW Medical Labour Force Surveys 1997 to 2009: Explanatory notes on the Medical Labour Force time series



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