Preface

The Medical Schools Outcomes Database and Longitudinal Tracking Project, also known as the MSOD Project, was initially funded by the Commonwealth Department of Health and Ageing in 2004 and then by Health Workforce Australia from mid 2011.

The aim of the project is to collect robust demographic, educational, career intention and practice data on medical students and doctors across all Australian and New Zealand medical schools.

One of the long term objectives of the MSOD Project is to provide a foundation for research projects, which will contribute to the national and international literature on medical education and its relation to workforce needs. Since its commencement nine years ago, the MSOD Project has amassed a large amount of data of value not only for its educational research potential, but also for those shaping health workforce policies in Australia and New Zealand. As with any prospective multi-cohort longitudinal study, MSOD’s potential and value increase with each year that it continues.

As part of the 2009 MSOD Agreement, Medical Deans had agreed with the Commonwealth to establish a number of target research projects on the MSOD data that will contribute to national medical workforce planning. Resulting from this, several grants were allocated to stakeholders through a competitive process to analyse the MSOD datasets. Areas of analysis included medical workforce planning, rural health education, Indigenous Health and international medical graduates and students.

The outcomes of the funded research were showcased at an inaugural MSOD Research Forum held in 2011. The forum highlighted the value of the MSOD datasets and the analyses provide important findings that are useful to government in developing policy and in its strong commitment to planning for a medical workforce and to improving health outcomes for rural and Indigenous communities.

This report is a proceeding of the day and an overview of the research undertaken by the research grant recipients. The research findings are not intended to be comprehensive but rather to provide snapshots of the analyses.

The work could not have been completed without the contribution of the investigators and Project staff. I congratulate them all for their efforts.

Professor Nicholas Glasgow  
Chair MSOD Project Board  
Dean, Medical School  
Australian National University
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<tr>
<td>CMSQ</td>
<td>Commencing Medical Student Questionnaire</td>
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<tr>
<td>COAG</td>
<td>Council of Australian Governments</td>
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<td>DoHA</td>
<td>Australian Government Department of Health and Ageing</td>
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<td>FRAME</td>
<td>Federation of Rural Australian Medical Educators</td>
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<td>GP</td>
<td>General Practitioner</td>
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<td>GRHANITE™</td>
<td>GeneRic HeAlth Network Information Technology for the Enterprise</td>
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<td>GSM</td>
<td>General Skilled Migration</td>
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<td>HECS</td>
<td>Higher Education Contribution Scheme</td>
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<td>HETI</td>
<td>Health Education and Training Institute (NSW)</td>
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<td>HWA</td>
<td>Health Workforce Australia</td>
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<td>IMG</td>
<td>International Medical Graduate</td>
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<td>Medical Deans</td>
<td>Medical Deans Australia and New Zealand Inc.</td>
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<td>MSOD</td>
<td>Medical Schools Outcomes Database &amp; Longitudinal Tracking Project</td>
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<tr>
<td>NTP</td>
<td>National Training Plan</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>PGY</td>
<td>Postgraduate Year</td>
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<td>RCS</td>
<td>Rural Clinical School</td>
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Executive summary

Introduction

The MSOD project

The Medical Schools Outcomes Database and Longitudinal Tracking (MSOD) project is the world’s first nationally-coordinated project for tracking medical students through medical school and into prevocational and vocational training. Established in 2004 by funding from the Australian Government Department of Health and Ageing, a pilot study was conducted in 2005 and MSOD began collecting data nationally in 2006. In 2011 funding responsibility was transferred to Health Workforce Australia (HWA). The project is hosted by Medical Deans Australia and New Zealand (Medical Deans) and all Australian medical schools are involved.

The Inaugural MSOD Research Forum

The Inaugural MSOD Research Forum was held on Friday 4 November 2011 at the University of Technology Sydney. The forum aimed to showcase MSOD’s research activities, synthesise the research findings and determine new initiatives and future directions. The forum brought together a range of staff from medical schools from Australia and New Zealand, representatives of medical schools, hospitals, key medical organisations, medical student organisations, the Group Of Eight, the Australian Government Department of Health and Ageing, and HWA. There were expert presentations on a range of issues, breakout-group presentations and discussions on specific research topics, and a concluding plenary session. Four themes were emphasised in the forum: medical workforce planning; rural health education; Indigenous health; and international medical graduates and students.

Health Workforce Australia

HWA, established in 2008 as a national agency, is developing the National Training Plan (NTP), which will develop strategies to provide the estimated numbers of professional entry, postgraduate and specialist trainees required between 2012 and 2025 to achieve self-sufficiency. The NTP will use MSOD data to assist in understanding the future supply of medical specialists.

Highlights of recent MSOD-based research

The recruitment and retention of Indigenous medical students (Dr Lilon Bandler)

Note: This presentation was cancelled and only information from the original abstract is provided.

This study aimed to identify and describe the Indigenous medical student population, identify similarities and differences between the Indigenous and total medical student populations, and link Indigenous medical student recruitment and retention patterns to Indigenous support and Indigenous health resources available at medical schools. This study is the first time statistical analyses have been conducted on a national scale on the Indigenous medical student population.
The role of personality and temperament in students’ initial intention and subsequent decisions around medical career choice early in their career (Associate Professor Mike Jones and Dr Lisa Lampe)

Personality factors are thought to influence where and how doctors will ultimately practice. This study, using MSOD data collected from over 1000 students across seven medical schools combined with additional questionnaires, examined how aspects of personality (extraversion, neuroticism, sensitivity, openness, agreeableness, interpersonal compatibility and conscientiousness) related to making decisions about practising in a rural area (versus urban), and to choosing specialties (versus general practice). Relatively subtle, but potentially important differences were found between students intending rural versus urban practice, and between generalism versus specialties. There was a small gender difference in speciality choice, with males more likely to favour surgery and females more likely to nominate careers with more personal contact and more flexibility. This study shows the importance of matching the individual to an appropriate career to help them flourish in their job.

What are the employment outcomes for international medical students graduating from Australian medical schools? (Professor Lesleyanne Hawthorne, Ms Anna To and Associate Professor Diann Eley)

This research examined trends in international medical student enrolment in Australian medical degrees, including the extent to which students remain in Australia following graduation. Based on analysis of the MSOD database and the Australian Graduate Destination Survey, employment and salary outcomes for international medical students were defined, compared to those of domestic medical graduates. At the commencement of their medical studies, 45% of international medical students wish to remain in Australia. By their final year an extraordinary 78% accept Australian internships – virtually all those who are eligible to stay (once ineligible government sponsored international students are excluded). North Americans are most likely to do so (around 92%). Most importantly, former international students were demonstrated to achieve stellar employment outcomes relative to overseas-trained international medical graduates (IMGs), whom Australia has been importing in large numbers. As demonstrated by analysis of the Graduate Destination Survey, 99% of former students still resident in Australia secure full-time medical employment within 4 months of graduation – an outcome directly comparable to domestic student rates. By contrast just 53% of IMGs secure medical employment of some kind within 5 years. While the great majority of former students wish to stay in Australia after completing their medical degrees, their future retention will depend on whether they can secure clinical training and internship placements. It is important also to examine their length of retention, including their willingness to work in rural sites. There are ethical issues surrounding the retention in Australia of IMGs who come from countries which need those doctors to return home to support their own medical workforces. However the great majority of international students have self-funded their Australian degrees. There are arguably more serious ethical issues associated with the Australian norm – recruitment of thousands of IMGs per year whose countries have wholly funded their medical education.

Solving the GP shortage: Student characteristics that may lead to a career in general practice (Professor Christine McMenamin and Dr Nicole Koehler)

Note: This presentation was cancelled and only information from the original abstract is provided.

Australia is currently experiencing a shortage of general practitioners, especially in rural areas. The study aimed to examine which student characteristics, at commencement and completion of the course, are related to pursuing a career in general practice. Using information from MSOD for students who commenced in 2005–10 and completed in 2008–09, the results showed that medical students who were older, female, married or living with a partner, had dependent
children, had dependents other than children, were born in Australia, did not speak a language other than English at home, were raised in a rural location, and were enrolled at a GP-focused university, were more likely to express a preference for general practice at the commencement of their degree. Identification and targeting of students interested in pursuing a career in general practice may assist in alleviating the shortage of general practitioners within Australia.

A cluster analysis of MSOD student characteristics and practice intentions (Dr Deborah O’Mara and Ms Yu Sun Bin)

This research aimed to determine whether cluster analysis could be used to identify subgroups of students entering medical school. Data from the 2005 and 2006 commencing medical student questionnaires (CMSQs) were used including demographic, ethnicity and financial variables, as well as practice location and medical practice specialty intentions. The results identify students - with interests in areas such as teaching and research or rural practice, so that student educational experiences can be tailored to enhance the likelihood of pursuing such career options. Future, more detailed analysis will look at data from exit surveys and specific medical schools. A number of issues relating to medical workforce education were raised, including suggestions that: it is important not to streamline students too early; there is the potential for tailoring and/or mentoring to better meet student expectations; there is the potential to reorientate how medicine is taught to attract students to university; technical specialist training should be offered in regional and rural areas; and there are increasing demands on clinicians to teach.

Why does a rural background make doctors more likely to work in rural areas and how consistent is the effect? A study of the rural background effect (Associate Professor Mike Jones, Dr Matthew McGrail and Professor John Humphreys)

This work aimed to provide some insight into why people of rural background are more likely to work in rural areas following graduation. While the ‘rural background’ effect is known to be quite strong, there is little understanding of why it occurs. The study linked MSOD’s CMSQ data on the rural practice intentions of new medical students to their background using external data about their location of upbringing (grouped into six factors). The results indicated that students of a rural background were about 13 times more likely to intend to practice in a rural area than students of a non-rural background. Isolation tended to strengthen the association (that is, the more isolated upbringing the student had the more likely they would select a rural area); growing up in a hot, dry climate or an area of lower socio-economic status tended to weaken the association, as did older-age entry and marital status. Further research is needed.

The FRAME — Rural Clinical School: Seven years experience (Professor Dawn DeWitt)

In 2004, members of the Federation of Rural Australian Medical Educators (FRAME) developed an exit survey aimed at evaluating rural clinical school (RCS) selection, experience and outcomes. This was adapted in 2005 for use by RCSs and was developed in parallel with, and builds upon, MSOD. The pilot study found that RCS students from rural backgrounds were ten times more likely to choose rural practice after an RCS experience than other students. Although most students are satisfied with their RCS experience, students who are ‘forced’ to attend an RCS express significant dissatisfaction and concern. The data also show that RCS experiences across different universities are excellent, even with fewer traditional ‘academic’ teachers and registrars in rural areas. In order to meet workforce shortage goals, students need to see RCSs as academically excellent and supportive environments, and they must see clear training and career trajectories in rural environments, including those for specialties other than general practice. The role of the newer regional medical schools urgently needs to be evaluated in this context. The four main issues that emerged were: the need for a specialty training academic pipeline; the impact of isolation in rural and remote areas; the influence of post-study debt load on career choice; and the need for funding to support specialist training in rural areas.
Key research themes

Medical workforce planning (Emeritus Professor Louis Landau)

Medical workforce predictions have traditionally been difficult to make and have often been proved wrong, thus MSOD has become a valuable tool for workforce planning. It is important to have both a free-market approach and to regulate career choice to ensure that the medical workforce matches community needs. The changing ratio between generalists and specialists is important — at the moment Australia has a shortage of generalists — and thus there is a need to recruit both international graduates from Australian medical degrees and IMGs. A better understanding of how to provide appropriate training paths and the recognition of prior learning is needed, along with a training framework that allows people to move from generalism to specialism, and vice versa, with reasonable flexibility. Maldistribution is the largest problem in Australia, with a shortage in rural and remote areas, especially in areas of Indigenous health. There is a lot more work to be done on specialist mapping to find out which areas have the greatest need. We also need to address career image where there are gaps, and considerations include importance, remuneration, risk perception and opportunities for professional development.

Rural health education (Professor Dawn DeWitt)

Australia has a relatively large number of doctors per capita — the main problem is where they are and what they are doing, with a considerable divide between metropolitan and rural areas (e.g. only 7% of specialists in Victoria live outside metropolitan areas). There are a number of problems associated with maintaining the rural medical workforce, including competition from ‘corporate’ recruiters, and the fact that overseas-trained doctors generally cannot and do not want to teach. MSOD and FRAME data shows that medical students want academic excellence in rural clinical schools (RCS), and other studies have shown that excellence can be delivered. Other issues identified by prospective medical students entering RCS include: the need for specialist training pathways; partner and friend issues; and perceived personal, family and professional ‘isolation’. Traditional models commonly used for intern teaching are limited by the number of interns who can be taught by the one medical practitioner. To keep up with the number of teachers required, we need to research, prove and fund more efficient models.

Indigenous Health (Dr Shaun Ewen)

Indigenous Health practitioners represent only about 0.2% of the Australian health workforce. When looking at data relating to Indigenous medical students and educational outcomes, it is important to distinguish between recruitment and retention of students. While statistics on recruitment, retention, completions, graduations and registrations is now available through the MSOD, the analysis is yet to be pursued. It will be important to link Indigenous medical student recruitment and retention patterns to Indigenous support and health education resources available. Indigenous students may have better retention rates in particular locations. There are four main reasons why we need increased recruitment and retention of Indigenous students: rights-based arguments; for health workforce development; to improve patient outcomes; and to impact on the medical curricula. There is a role for Indigenous clinicians in shaping the health workforce, especially for directions and priorities of Indigenous health services. This may help reduce the unacceptable disparity in health outcomes between Indigenous and non-Indigenous people.
International medical graduates and students (Professor Lesleyanne Hawthorne, Ms Anna To and Associate Professor Diann Eley)

The HWA National Training Plan has set a ‘self-sufficiency goal’ by 2025 for Australia, but Australia’s level of dependence on overseas-trained health workers is currently extremely high. Many international medical graduates (IMGs) are currently accepted on a temporary four-year basis to work in ‘areas of need’. One advantage from government and employer perspectives is that we can be coercive about where such doctors work (i.e. in undersupplied - usually rural and remote - areas). However many never achieve full registration. Large numbers leave after four years, resulting in a constant need for replacement. There are a range of problems associated with the recruitment of overseas-trained doctors, including significant differences in training, their registerability, period of dependence on conditional registration, and English language standards. Within this context international medical students who have qualified in Australia have emerged as a highly attractive alternative resource. In 1999 former students became immediately eligible to migrate, unless they were sponsored by their government and thus required to return home. Compared to international medical graduates, former students have fully recognised qualifications, have self funded to train to our norms, and are exempt from English language testing. Given they are typically aged 23 years old when they graduate, their productivity is also exceptional, relative to the great majority of overseas-trained doctors, should they remain.

MSOD — The next steps

Translating research outcomes into policy (Professor Sally Redman and Professor Nicholas Glasgow)

It is important to have a rigorous evidence-based approach to public policy in Australia. Evidence from research can be helpful in determining policy in three ways: it can help set the agenda; it can inform decisions about specific programs and policies; and it can demonstrate the impact of policies and programs. Many opportunities to use research evidence are currently missed and this can be improved. Closer engagement and understanding is needed between policy makers and researchers because each group operates with a different set of drivers. Methods to enhance the uptake of research findings by policy makers include: taking a closer partnership approach; engaging early; providing for brokerage; and using written agreements. The most productive way in which research can interact with policy is the co-production of knowledge, with both researchers and policy makers involved from the outset.

Future challenges for medical education (Mr Robert Wells)

There have been major changes in medical school approaches over the past 20 years aligned with the increasing pressure to produce some 3000 medical graduates each year. A new challenge for medical schools is to equip doctors to work in a health environment dominated by chronic disease and ageing. There is now also a stronger interplay between health and social issues, plus expanded roles for allied healthcare professionals. The health policy environment is also changing rapidly, along with new structures in which doctors have to play lead roles and new funding models beyond the traditional fee-for-service paradigm. In addition, there is stronger pressure for doctors to work where they are needed and a large overseas-derived workforce to manage. MSOD provides a unique source of data on the medical workforce, and will into the future. But will this be enough? Will the information help us understand and fulfil the social obligations? MSOD is a start, but Medical Deans will need to start to think about what other research needs to be done if our medical schools are going to continue their tradition of delivering world-class health care for Australia.
Technological innovations and MSOD

The Australian Medical School Mapper project (Dr Ian McRae)

The Australian Primary Health Care Research Institute was commissioned by Medical Deans to examine MSOD data from 2006 to 2010 and create an online mapping tool which would allow universities, policy makers and other stakeholders to reveal the regional source or footprint of medical school applicants and their intention to practice in urban/rural areas, analysed by area, university and background factors (such as rurality). The resultant website is menu driven and easily navigated from one view to another. It has filters which can be sequentially applied to narrow down a search, or to overlay or underlay data. Results are presented as maps with details shown graphically according to the attribute selected (e.g. locations and details of medical schools, proportion of rural and international students, and where students want to go). This software will be increasingly powerful and useful for student and workforce mapping as the MSOD dataset expands over the next five years.

GeneRic HeAlth Network Information Technology for the Enterprise (GRHANITE™) (Dr Douglas Boyle)

The HWA report, National Health Workforce Innovation and Reform Strategic Framework for Action 2011–2015, recommended the development of ‘an authoritative National Statistical Resource that brings health workforce related data and information from a variety of sources together at a national level to underpin future workforce planning across the system’. The MSOD data is an excellent resource which could be dramatically enhanced by bringing it together with other datasets. A key challenge in using data from other sources will be determining what data can be brought together and under what circumstances, with a key consideration being privacy. The GRHANITE™ system uses a non-reversible mathematical technique to generate statistical linkage keys, and could be used to overcome these difficulties. It avoids most privacy barriers by guaranteeing the data cannot be converted back into the original identifying names. About 120 GP surgeries, family planning clinics and clinical laboratories around Australia already use GRHANITE. The future of record-linked research will require collaboration and the use of more than one technique.

NSW Government support for medical education and training

The Hon Jillian Skinner MP

The New South Wales (NSW) Government is strongly committed to medical training and recognises the need for a training pipeline for medical graduates. As part of the 2012 budget, the NSW Government has allocated new funding of approximately $21 million over four years to expand postgraduate medical training in NSW. Intern funding of $11.2 million over four years with $2.8 million allocated to support local health districts to create additional intern training positions each year has also been provided. In addition, new funding of $7.2 million over four years has been allocated to establish extra medical specialist training positions, and $3.9 million over four years to support the establishment of medical specialty training networks. Funding has been allocated to develop and support the infrastructure required for development of the NSW rural generalist training pathway. The government has also provided funding of an additional $6.8 million per year for additional postgraduate year 2 and 3 training positions in rural and regional areas and $3.9 million for 21 vocational training places. The availability of longitudinal data on health graduates through MSOD is an important element in the development of comprehensive workforce plans. The Director General of Health for NSW has convened a taskforce to develop a health professionals workforce plan for 2012 to 2025.
Summary of issues and implications for MSOD

- **Funding** – The MSOD project has now reached a point where the data has become extremely useful, but certainty of long-term funding must be assured.

- **Collaboration and linkages** – There is a need for linkages between FRAME and MSOD surveys. GRHANITE privacy software, if installed at each medical school and at national registration, would be very useful.

- **Research methods** – There are quite a few projects now completed or in progress using MSOD data. However, it is important to hear about methods as well as results.

- **New Zealand data** – Data from New Zealand needs to be included in some way.

- **Response rates and longitudinal tracking** – Individual, longitudinal, postgraduate data would make MSOD extremely useful.

- **Student engagement** – Keeping students engaged in data collection is essential.

- **Medical workforce planning** – There are many issues relating to medical workforce planning, some of which could be addressed through MSOD data collection and analysis.

- **Rural health education** – Further effort is needed to understand the factors involved in why people choose a rural-based career and how that information could lead to policy changes. Issues relating to training in rural areas need to be addressed.

- **Indigenous health** – It is important to gather data on a national scale on the Indigenous medical student population, not only on retention, but on support, completions, graduations and medical registrations, and the links with Indigenous support and education resources in medical schools.

- **International medical students** – International medical students have become an important Australian health workforce resource. However, they cannot remain unless they secure PGY1 training places – a critical requirement if Australia seeks their future contribution. It is essential to address this issue, including the role of international students from 2025 in relation to Australian self-sufficiency.

- **Overseas-trained medical professionals** – Australia’s level of dependence on overseas-trained medical professionals is extremely high, and there are many issues which need to be addressed in terms of training, skills, language skills, placement and retention.

- **Providing input to policy formulation** – There is considerable potential for data to influence policy, but there are many barriers to communication between policy makers and researchers. Ways in which researchers can enhance the uptake of research findings by policy makers need to be explored.
1 Introduction

1.1 The MSOD project

The Medical Schools Outcomes Database and Longitudinal Tracking (MSOD) project\(^1\) is the world’s first nationally-coordinated project for tracking medical students through medical school and into prevocational and vocational training. It is an ambitious initiative, relying on involvement from a broad range of participants and stakeholders throughout the medical education continuum in order to maximise returns, relevance and usage.

MSOD was established in 2004 by the Australian Department of Health and Ageing. A pilot study was conducted in 2005, and MSOD began collecting data nationally in 2006. Funding responsibility was transferred to Health Workforce Australia (HWA) in 2011. MSOD is now the Australian Government’s main data collection tool for medical student information.

The project is hosted by Medical Deans Australia and New Zealand (Medical Deans) through which all Australian medical schools are involved. The project is a collaboration of eight key stakeholder organisations representing students, postgraduate education and training, rural and Indigenous health, and workforce planning:

- Australian Indigenous Doctors’ Association
- Australian Medical Association Doctors-in-Training
- Australian Medical Students’ Association
- Australian Rural Health Education Network
- Confederation of Postgraduate Medical Education Councils
- Committee of Presidents of Medical Colleges
- Federation of Rural Australian Medical Educators
- National Rural Health Students Network.

MSOD project objectives include:

- provision of an effective, reliable evaluation mechanism for assessing long-term outcomes of educational programs, in particular those aimed at addressing future medical workforce needs (rural health, areas of workforce need, Indigenous health, specialty areas, and others as they arise or are implemented)
- provision of a secure, reliable source of accurate, up-to-date data for long-term medical workforce planning
- determining the effectiveness of targeted programs and interventions in influencing the career decisions of medical students
- promotion of strategic reform of medical education policy and programs at university, state and federal levels to match program and policy frameworks with national health priorities
- provision of an information resource for research projects that will contribute to the national and international literature on medical education and workforce planning.

1.2 The Inaugural MSOD Research Forum

Hosted by Medical Deans, the Inaugural MSOD Research Forum was held on Friday 4 November 2011 at the UTS Aerial Function Centre, University of Technology Sydney. The aim of the forum was to showcase MSOD’s research activities, to synthesise the research findings and to determine new initiatives for future directions for MSOD. There were four themes in the forum:

- medical workforce planning
- rural health education and workforce
- Indigenous medical students and training in Indigenous settings
- international medical students and graduates

The forum brought together staff from Australian and New Zealand medical schools, representatives of medical colleges, hospitals, key medical organisations, medical student organisations, the Group of Eight, the Australian Government Department of Health and Ageing, and Health Workforce Australia. In total, 76 participants attended (see the Appendix for the participant list).

The forum involved expert presentations on a range of issues, as well as panel discussions including five presentations on specific research topics in breakout groups which allowed detailed presentations of research findings and closer examination of issues by participants. The NSW Minister for Health, the Hon Jillian Skinner MP, also presented aspects of the government's current funding program for medical workforce education and training. Mr Robert Wells, Director, Australian Primary Health Care Research, gave a keynote address on future challenges for medical education.

1.3 The role of Health Workforce Australia

Health Workforce Australia (HWA) was established following a Council of Australian Governments (COAG) agreement in 2008 as a national agency through the National Partnership Agreement on Hospital and Health Workforce Reform. Based in Adelaide, it was allocated funding of $1.1 billion over four years to build the health workforce and help with national workforce planning. HWA has a particular focus on linking efforts across the healthcare and higher education sectors and has four program areas to lead health workforce reform:

1. information, analysis and planning
2. clinical training reform
3. workforce innovation and reform
4. international health professionals.

Australia is facing a number of challenges to the health system and health workforce which call for a coordinated national approach to health reform. These challenges include: an ageing population; increasing health system costs; health workforce shortages; and a health workforce maldistribution (i.e. large variations exist in access to the health workforce, particularly in rural and remote areas).

The National Training Plan (NTP) aims to achieve self-sufficiency in the supply of doctors, nurses and midwives by 2025. It will provide the estimated numbers of professional entry, postgraduate and specialist trainees which will be required between 2012 and 2025 to achieve self-sufficiency. The NTP will be conducted in two phases: (1) generation of baseline
and alternative scenario workforce supply and demand projections; and (2) generation of annual estimates of the number of student and trainee (for doctors) places required to enable self-sufficiency by 2025 (due December 2011).

MSOD is the primary data source for NTP for medical student enrolments in each year of each medical school in Australia, and MSOD data will also be used to assist in understanding the future supply of medical specialists. Predicting what specialty students choose to pursue can greatly assist workforce modeling, and understanding the employment outcomes for international medical students graduating from Australian medical schools is vital. HWA has committed $425 million over the next three years to support growth in student numbers in 22 of the health professions through expanding clinical-training capacity, and the MSOD clinical placement data provides a useful source for understanding medical student clinical placements across Australia.
2 Highlights of recent MSOD-based research

2.1 The recruitment and retention of Indigenous medical students

Dr Lilon Bandler, MBBS, GradDipHPol, FRACGP, Senior Lecturer, Indigenous Health Education Unit, University of Sydney

Note: This presentation was cancelled and only the original abstract is provided here.

This project had three aims:

1 to identify and describe the Indigenous medical student population
2 to identify similarities and differences between the Indigenous and total medical student populations
3 to link Indigenous medical student recruitment and retention patterns to Indigenous support and Indigenous health resources available at medical schools.

This project will mark the first time statistical analyses have been conducted on a national scale on the Indigenous medical student population, as there has previously been an absence of data. This will be significant for developing recruitment and retention programs, funding, and future research. It is expected that the findings will be a preliminary step in developing a national evidence base for Indigenous medical student recruitment and retention.

2.2 The role of personality and temperament in students’ initial intention and subsequent decisions around medical career choice early in their career

Associate Professor Mike Jones, Associate Professor and Deputy Head of the Psychology Department, Macquarie University; and Dr Lisa Lampe, Senior Lecturer in Psychiatry, Sydney Medical School, University of Sydney

Personality factors are thought to influence where and how doctors will ultimately practice and there are a number of theories on why people make particular career decisions. There is a widespread view that rural doctors are subjectively different from doctors practicing in cities. A small number of empirical studies have found some suggestion of differences in personality profile and temperament between rural doctors and urban doctors, and doctors in different specialties. The aim of this study was to determine whether students commencing medical studies intending to practice in rural areas versus urban or general versus specialty practice differ in personality profile. It examined how aspects of personality (extraversion, neuroticism, sensitivity, openness, agreeableness, interpersonal compatibility and conscientiousness) related to making decisions about going to rural areas, or to specialties. There were two definitions of rural intention: one more strict and the other broader. The data collected at this early stage of students’ medical career will later be correlated with their actual career choices. For the study, incoming medical students at seven medical schools completed two personality instruments: the NEO-FFI and the Adjective CheckList (ACL). These data, collected from just over 1000 students across seven medical schools, were linked with MSOD.

Despite a general view that rural practice means general practice, only about 33% of students intending rural practice nominated generalism as their preferred type of practice. In contrast, almost 90% of those intending urban practice also planned some form of specialty. Relatively subtle but potentially important differences were found between students intending rural versus
urban practice, and between generalism versus other forms of practice. Differentiation on personality domains appears to be more widespread in the rural versus urban-intending contrast than the generalist versus specialist-intending contrast. The study found that three of the five personality domains differentiated in terms of rural/non-rural intention, with higher scores for openness, conscientiousness and agreeableness among those students who intended to practice in rural areas than those who intend to practice in urban areas. The stricter definition gave clearer results, although the difference was not large in absolute terms.

There was not a large gender difference in choice of generalism or speciality, although males were more likely to favour surgery whereas females were more likely to nominate careers with more personal contact and with more flexibility. The age grouping was quite small, but students who nominated general practice were slightly older than those interested in surgery were, although again the difference was not large. There were some personality contributions to specialties. Personality is thus probably not the dominant factor in decision making, but it may play a role. We hope to follow up these students after they finish their studies. It would be interesting to see what personality differences emerge between different medical schools.

In conclusion, the data collected on a large sample of medical students suggested that personality plays a small but potentially important role in students' attitudes to both rural practice and generalism. The findings were also broadly congruent with previous studies of medical practitioners. The implications of the study relate to the importance of matching a person to an appropriate career: people who find a match flourish in their jobs. These are all highly functional students so the differences were not large, but providing more information about what each speciality is like and how it would relate to their temperament may help people in their choice of career.

2.3 What are the employment outcomes for international medical students graduating from Australian medical schools?

Professor Lesleyanne Hawthorne, Associate Dean (International), Medicine, Dentistry and Health Sciences, University of Melbourne

The past 10 years have coincided with extraordinary growth in international student mobility, with Asia emerging as the major source of supply. There is increased opportunity for students to convert to permanent resident status through a process of ‘two-step migration’. This research examined trends in international medical student enrolment in Australian medical degrees, including the extent to which former students remain in Australia following graduation. Based on analysis of the MSOD database and Australia's graduate destination survey, employment and salary outcomes were defined, compared to those secured by domestic medical graduates.

It is clear that many international medical students wish to stay in Australia after completing their medical degrees. In year 1 of their course 45% intend to stay, rising to 78% in the final year who actually accept internships. However whether international students stay depends on a range of factors – in particular whether they are bonded by their governments to return home (commonly students from Malaysia and Singapore), and whether they can get access to Australian internship placements. In relation to the former, there are ethical issues surrounding retention in Australia of IMGs who come from countries which need those doctors to return home to support their own medical workforces (eg from Africa and Asia). As demonstrated by the research, Canadian and American students are currently the most likely to stay (around 92%).

A large majority of former students prefer to practice in metropolitan areas, but the study demonstrated 62% accept PGY1 places based in regional or rural town sites. It is important for
us to examine in detail their scale of retention following the internship year; examine ways to make it easier for them to remain in Australia where there are no ethical issues related to retention; plus explore the issue of rural/ regional retention.

As demonstrated by the study, former international students achieve exceptional outcomes relative to international medical graduates (IMGs). As demonstrated by Census analysis, 53% of IMGs secure medical employment within 5 years (including those selected across all immigration categories). By contrast 99% of former international medical students have full-time medical employment within four months – directly comparable rates to domestic recent graduates.

International medical students have become an important Australian health-workforce resource. They are positioned to make an impressive contribution in the future, so long as they secure a clinical training place. Those unable to do so are likely to be recruited by countries such as New Zealand and Singapore, in the context of these countries’ medical shortages and Australia’s a strong international reputation for medical training. For those who remain in Australia, it would be useful to track how long they stay, where they practice, and in what medical fields.

2.4 Solving the GP shortage: Student characteristics that may lead to a career in general practice

Professor Christine McMenamin, BSc(Hons) PhD MBBS DCH FRACGP, Director of Curriculum (MBBS Central), Faculty of Medicine, Nursing, Health Science, Monash University; and Dr Nicole Koehler, BSc (Hons) MSc PhD GradDipEd, Monash University

Note: This presentation was cancelled and only the original abstract is provided here.

Australia is currently experiencing a shortage of general practitioners, especially in rural areas. Thus the study aimed to examine which medical student characteristics, at commencement and completion of the course, are related to their preferences in pursuing a career in general practice. Information regarding students’ characteristics and career preferences were obtained from MSOD for students who commenced medicine in 2005–10 and who completed in 2008–09.

The results showed that medical students who were older, female, married or living with a partner, had dependent children, had dependents other than children, were born in Australia, did not speak a language other than English at home, were raised in a rural location, and were enrolled at a general-practice-focused university, were more likely to express a preference for general practice than a career other than general practice at the commencement of their degree. Limited data was available for students at completion and thus analyses could only be conducted for some variables. However, for these variables the findings were in the same direction as that for commencement data.

In conclusion, specific student characteristics are associated with an interest in pursuing a career in general practice. Identification of the characteristics and targeting those students with the characteristics may assist in alleviating the shortage of general practitioners within Australia.
2.5 A cluster analysis of MSOD student characteristics and practice intentions

Dr Deborah O’Mara, Senior Lecturer in Assessment, Sydney Medical School, University of Sydney; and Ms Yu Sun Bin, Associate Lecturer in the Office of Medical Education, University of Sydney

This research aimed to determine whether cluster analysis could be used to identify subgroups of students entering medical school based on demographic characteristics and career interests. Ideally, the technique would allow students to be grouped in a meaningful way to enable education to be streamlined to better meet workforce needs as well as deliver programs to meet student expectations. This method used a novel multivariant analytic approach to demonstrate MSOD utility for admission policies, workforce planning and future research. Data from the 2005 and 2006 commencing medical student questionnaire (CMSQ) were used and included demographic, ethnicity and financial variables, as well as practice location and medical practice specialty intentions.

Extensive preliminary analyses were conducted before deciding on the final 23 cluster variables. Two-step cluster analysis and hierarchical clustering were explored to determine the best number of clusters. A k-means cluster analysis with six clusters was used to identify the final cluster solution. According to discriminant analysis, the cluster analysis result has very high predictability with the saved cluster membership for 96% of a development sample being correctly predicted as well as 96% of the validation or hold-out sample. The analysis resulted in six clusters of interest:

1. potential local and overseas metropolitan workforce (18%)
2. potential rural GPs and physicians (23%)
3. potential rural technical specialists (ophthalmologists, radiologists, surgeons, etc) (15%)
4. potential researchers and academics (15%)
5. potential people-oriented specialists (GPs, physicians, paediatricians, etc) (14%)
6. potential overseas researchers and academics (14%).

Combining clusters (2) and (3) indicated that some 38% of students would prefer a potential rural career, and combining clusters (4) and (6) indicated that some 29% were looking for an academic career. The research showed that the education experiences of students differ because of their preferences (people-oriented vs technically-oriented, urban-oriented vs rural-oriented).

Identifying student preferences is important to delivering programs to meet student expectations. However, students also need to be allowed to change pathways, particularly at the undergraduate level at which programs should have a broad focus. Giving non-rural interested students more exposure to and understanding of a rural career may lead them to change their preference, which would help meet workforce needs.

Other factors that influence choices, such as partnering or having children, over the duration of a person’s career could also be included in this analysis. For example, in the current system people who want to become technical specialists need to be in the city for training, and by the time they qualify, ‘life forces’ (partnering, mortgage, etc) can make relocation to regional and rural Australia less likely. Understanding that people intending to have a technical specialisation want to train and live in regional and rural Australia would help streamline technical specialist training to regional and rural areas.
The research also showed that there is potential to reorientate how medicine is taught to attract students to university (for example, by including research-led teaching). Research programs could be focused for fewer students, with the potential for tailoring or focusing the research to better meet student expectations. However, this raises the question of whether resources would be mismanaged by concentrating on specific areas such as research.

In conclusion, the results of the analysis can be used to identify students with interests in areas such as teaching and research or rural practice, so that student educational experiences are tailored to enhance the likelihood of pursuing such career options. In future, more detailed analysis will involve looking at data from exit surveys and specific medical schools.

2.6 Why does a rural background make doctors more likely to work in rural areas and how consistent is the effect? A study of the rural background effect

Associate Professor Mike Jones, Dr Matthew McGrail and Professor John Humphreys, Professor of Rural Health Research in the Faculty of Medicine, Nursing and Health Sciences, Monash University

This work aimed to provide some insight into why people of rural background are more likely to work in rural areas following graduation (the ‘rural background’ effect). While this phenomenon has been often reported, and is known to be quite strong, there is little understanding of why it occurs, although there are some theories. For example, social cognitive career theory which takes a lifetime development view of people who become doctors posits that there are distal effects early in life which have a carry-over effect into adult life and career decisions.

The study linked demographic and CMSQ data on the rural practice intentions as stated by medical students as they came into medical school with their background using external data about their rural location of upbringing (location of their final high school taken from CMSQ data), as well as social factors, economic factors (from the Australian Bureau of Statistics), meteorological factors (from the Bureau of Meteorology), proximity to coast — in other words, many of the possible attributes of the location that might influence their interest in working in a rural location.

Of the 12,500 students who had completed the CMSQ, about 7,500 could be linked to the measures gathered about their rural location and location of upbringing. The remainder were overseas students or were Australian students who had been educated overseas, or who had not yet decided where they would work. About 20% had a rural background and about 21% stated that they wanted to work in rural areas (though those two groups are not necessarily the same people). The data provided quite a few individual metrics, some of which were quite strongly correlated. To make it a more manageable set of information about the locators, it was grouped into six factors using factor analysis.

The results of the analysis indicated that the odds of a rural background student intending to practice in a rural area was around 13 times higher than a non-rural background student. Of the six factors studied, only one showed any real evidence of accounting for the observed association between rural background and rural intention, which was the isolation factor (that is, the more isolated the student was the more likely they would select a rural area for a medical career). Growing up in a hot, dry climate or lower socio-economic status area tended to weaken the association, as did older-age entry and being married (which may be explained by factors such as family commitments). The other environmental and social factors did not explain very much of the observed association. Therefore this analysis did not contribute any further to an explanation as why rural background students intend to become rural doctors, except for the fact...
that the more geographically isolated they were at school the more likely they are to choose a rural location for practice. Further research is needed, including examination of what the students actually do when they graduate.

2.7 The FRAME — Rural clinical school: Seven years experience

Professor Dawn DeWitt, BA MSc MD FACP FRACP, Foundation Chair of the Rural Health Academic Centre, Melbourne Medical School and Clinical Dean, Rural Clinical School

In 2004, members of the Federation of Rural Australian Medical Educators (FRAME) developed an exit survey which was originally aimed at evaluating rural clinical school (RCS) selection, experience and outcomes. The survey was adapted in 2005 for use by RCS and was developed in parallel with, and builds upon, the MSOD minimum dataset. The information obtained could be used to improve RCS and regional programs, to cater better for student needs as well as address medical workforce shortages in rural and remote areas of Australia. Ethics and protection of student privacy was of high importance and software has been developed to de-identify student data by creating a unique cryptographic string identity. States differ, so breakdown by state was important. Although FRAME was administered ahead of MSOD, MSOD has now caught up, and data from RCSs and urban schools can be compared.

The pilot study found that RCS students from rural backgrounds were 10 times more likely to choose rural practice after a RCS experience than other students. Although most students are satisfied with their RCS experience, and a significant percentage anticipate rural practice at graduation from an RCS (around 60% overall), students who are ‘forced’ to attend an RCS express significant dissatisfaction and concern. The data also show that RCS experiences across different universities are excellent, even with fewer traditional ‘academic’ teachers and registrars in rural areas due to the clinical teacher workforce shortage. However, access to patients, a key positive feature of rural practice, is at risk given increasing student numbers.

The survey also showed: 47% of RCS graduates live in major cities and 41% identify as coming from rural areas; only 19% of RCS students indicate general practice as their preference on exit (this is well below the 50% goal); 77% of students chose RCS as their first choice; 97% of students would recommend attending RCS, despite involuntary allocation to attend; and 86% of RCS students would practice in a rural area if specialist training was available.

The FRAME study now includes most, but not all, universities and links to the MSOD database have been established. The FRAME data are set to help answer questions about how to encourage more students to choose rural practice as part of the new RCS program parameters. Perhaps the most important finding to date from the data is that RCS graduates want clear postgraduate training tracks, including those for specialties other than general practice, in rural environments. In order to meet the workforce shortage goals, students need to see the RCSs as academically excellent supportive environments and they must see clear career trajectories. The role of the newer regional medical schools urgently needs to be evaluated in this context and the FRAME study provides baseline data and a mechanism for comparative research.

Issues which emerged from the survey included:

• academic — a specialty training pipeline is needed for at least half RCS students; there is a need for evidence that specialist training outcomes can be achieved in rural settings

• isolation — working in rural or remote areas can be isolating and this can deter students; students with a rural background fare better because they know their way around

• debt load — this can influence career choice (data from the United States)

• funding — funding is needed to support specialist training in rural areas.
3 Key research themes

3.1 Medical workforce planning

Emeritus Professor Louis (Lou) Landau, AO MBBS MD FRACP, School of Paediatrics and Child Health, Faculty of Medicine and Dentistry, University of Western Australia

MSOD was initially funded by DoHA to evaluate the impact of rural initiatives, such as preferential enrolment of people with rural backgrounds, and the rural clinical schools. However, it has become a valuable tool for workforce planning as it provides accurate information on increasing numbers and career intentions, and it has facilitated understanding in a number of areas such as increased need for clinical placements, simulation training, funding increases, innovation and reform, workforce planning, and international recruitment.

Medical workforce predictions have traditionally been difficult to make and have often been proved wrong — in the past we frequently ended up with either too many or too few students. Because of the difficulty of making predictions, we must ensure that workforce planning activities are flexible and responsive. Rather than analysing demand based on things are they are now, we much model on how we believe they will be in the future.

There is much change in medical practice, such as increased focus on preventative healthcare, ambulatory care, care closer to home, new procedures (e.g. cardiac intervention) and, in particular, new workforce paradigms (e.g. health teams, nurse practitioners, allied health procedural practitioners). New technologies allow us to delegate many procedures to other health professionals, and this will have an influence on our future medical workforce.

On average, doctors are working slightly shorter hours (from 43.7 to 42.2 hours per week since 2005) but the cumulative effect of this is that one extra doctor is now needed for every 26 doctors, or an extra 3,000 to the 80,000 or so in the workforce. The distribution of medical practitioners is also important to acknowledge: there are 392 practitioners for every 100,000 people in major cities, but only 206 per 100,000 people in outer regional centres. The proportion of females has increased (36% in 2009), and the average age of doctors is 45 which may lead to a retirement crisis in 10 to 20 years.

Two issues which are being considered are:

- role substitution which could be cost effective, although there is a risk of eroding the professional base
- redefinition of the roles of medical practitioners, particularly considering what doctors are trained for (cognitive skills, team leadership and complex procedural competencies necessary for diagnoses) and determining how we need to address these in the future.

Health professionals need to learn more from each other, as well as with and about each other so that we have a greater understanding how each can contribute to health care more efficiently and effectively in the future. We also need information that will motivate those who undertake medical training to work in those areas where there is greatest need. The difficulty is knowing whether to have a free-market approach or to regulate career choice — in most cases it has to be a combination of both. Medically-trained people are needed in certain areas. However, we cannot impose choices on medical professionals; we have to encourage them to move into the areas that are needed as well as those that will be fulfilling for them in their future careers.
The changing ratio between generalists and specialists is important. Of clinicians, with 38% in primary care and 36% specialists. The questions we need to ask are: ‘Is that the right ratio? Is it going to provide the appropriate workforce for the future’. For most developed countries, healthcare costs are heading towards 20% of GDP (gross domestic product) and it is hard to see this as being sustainable. Specialists used to be a narrow pinnacle of the medical profession but from the 1950s the number of specialists has expanded dramatically. However, specialisation may have gone too far and there is now a shortage of generalists. Generalists are needed in major hospitals (this can help reduce costs), general hospitals, rural health services and in general practice. In Australia, only 20% of specialists do generalist cover (it is 40% in New Zealand and 50% in the United Kingdom). There is a need to recruit into generalism and this can be done through our local graduates (we need to understand what leads to interest in this area) and through international medical graduates (IMGs). Australia is highly dependent on IMGs and they are critical to filling our generalist jobs and areas of need, particularly in rural areas. There is a global shortage of doctors and an even greater global shortage of nurses.

We must also understand better how to provide optimal training paths and accept the recognition of prior learning, and having a training framework that allows people to move from generalism to specialism, and vice versa, with reasonable flexibility. Unfortunately this is currently not so.

Maldistribution is the largest problem in Australia, with a shortage in rural and remote areas, especially in areas of Indigenous health. There are also shortages in some states in specific areas such as general practice, psychiatry, obstetrics and gynaecology, radiology, haematology, oncology and ophthalmology. There is a lot more work to be done on specialist mapping to find out which areas of practice have the greatest need, and where.

In some areas, there is insufficient capacity for training due to a lack of potential trainers so they cannot get accredited because appropriate case mix and adequate supervision is needed for accreditation. Ideally, we would like to move more training into general hospitals, rural hospitals, private hospitals and the community, but until now these have not been able to satisfy college requirements. Clearly there needs to be changes which address this problem. We also need to align service delivery with training to maximise quality and address predicted gaps. This needs consideration by the colleges, health services and medical schools. We also need to address career image in areas where there are gaps, and considerations should include perceived importance, remuneration, risk perception and opportunities for professional development.

Implications of this complex situation are that:

• there is a need for accurate, comprehensive, representative, prospective data on a large cohort, which MSOD provides
• there is a role for workforce modelling, including data on supply and intentions of new graduates and demand by the population
• there must be flexibility to respond to change and individual choices
• we need to understand that considerations about work–life balance is changing
• we want prospective and collaborative planning and collaboration between all sectors (including immigration) is essential
• the current shift to graduate medical degrees (i.e. completion of a generic degree before enrolment in a specialist medical degree) needs to be monitored to determine its impact on the health workforce
3.2 Rural health education

Professor Dawn DeWitt, BA MSc MD FACP FRACP, Foundation Chair of the Rural Health Academic Centre, Melbourne Medical School and Clinical Dean, Rural Clinical School

On a per capita basis, Australia has a relatively large number of doctors (compared to countries such as the United Kingdom, United States and Canada) — the main issues are where they are and what they are doing. There is a considerable divide between metropolitan and rural areas. For example, in Victoria, 71% of rural doctors are overseas-trained doctors and only 7% of specialists in Victoria live outside metropolitan areas meaning that the majority of the rural population must travel to cities for specialist care.

Problems with maintaining the rural medical workforce have recently been exacerbated by the fact that ‘corporate’ recruiters have swelled the numbers of rural nonvocationally-registered doctors under remote supervision (telephone) making educational delivery even more problematic. The educational issue is that these new overseas-trained doctors generally cannot and do not want to teach, just as we are heading into a dramatic increase in numbers of medical students and post-graduates — calculations show that we will need some 156 full-time GPs just to teach the additional students.

MSOD and FRAME data has shown that medical students wanted academic excellence in rural clinical schools (RCS), and other studies have shown that excellence can be delivered. In fact, one study has shown that students from rural medical schools actually performed better in their exams than those from metropolitan schools. Other issues identified by prospective medical students entering RCS include: the need for specialist training pathways; partner and friend issues; and perceived personal, family and professional 'isolation' which was the biggest issue for those wanting to practice in urban areas at exit.

Results from a recent FRAME study have revealed that students from a rural background who also undertake a year at a rural clinical school (RCS) are 10 times more likely to want to practice in rural or regional areas than those who do not have a rural background. Caveats are that only 80%, at best (2007–10 results) would strongly consider rural practice after attending an RCS; 85% say they would consider rural practice if specialist training pathways were available; and overall, 50% want to specialise (i.e. have a career other than as a GP). If 80% of RCS graduates (which are 25% of all Australian medical graduates) practice rurally then 20% of graduates will be rural (if 60% then 15% of graduates will be rural) for 30% of the population — which leaves a considerable gap in community healthcare needs.

Traditional models commonly used for intern student/teaching, such as the Lucy Walters parallel consulting model, are limited in the number of student/interns who can be taught by the one medical practitioner and, if we are going to keep up with the number of teachers required for teaching needs, we need to research and prove some other models, such as one used by Professor DeWitt which has a central teaching room with a supervisor monitoring some 20–26 patients, plus four consulting rooms with two registrars who see six to eight patients each, an intern who sees four to six patients and a nurse practitioner or medical student who sees four patients. The problem at the moment is that we do not have any way to fund this sort of model; the only source of funding outside of public hospital hosts is the Practice Incentive payment (PIP) which only goes to general practitioners. With the addition of a student education card (similar to a Medicare card, that is charged with an educational payment session), expert teachers could adopt this multiple-supervision model.
3.3 Indigenous health

Dr Shaun Ewen, Director, Onemda, VicHealth Koori Health Unit

Historically, Australia has been very slow to have Indigenous medical practitioners, with the first Indigenous doctor graduating in 1984 (Helen Milroy from the University of Western Australia), whereas Canada had its first Indigenous graduate in 1886, America in 1889 and New Zealand in 1904. Indigenous health practitioners still represent only about 0.2% of the Australian health workforce. In 2005, the Australian Indigenous Doctors Association Healthy Futures Report published some best practice recommendations for recruitment and retention of Indigenous medical students and included a headline target of 350 extra Indigenous students in Australia by 2010, but this was not achieved. Data from a Medical Deans report of 2011 shows a rise to about 210 Indigenous students in medical schools over 2003 to 2011.

When looking at data relating to Indigenous medical students and understanding educational outcomes, it is important to make a distinction between recruitment and retention of students. At the moment, only statistics on recruitment are collected. There is a lack of statistics collected on retention, and on completions, graduations and registrations. In obtaining this data, it will be important to link Indigenous medical student recruitment and retention patterns to Indigenous support and Indigenous health education resources available at medical schools.

We also need to examine the reasons why we might want to recruit medical students and the link between having Indigenous students in our programs and the importance of having curricula to support them. There is no use in universities having Indigenous students just to be self serving. We need to look at why we are recruiting Indigenous students into medical schools in the first place.

There are four main reasons why we need increased recruitment of Indigenous students:

- rights-based arguments
  - for access, equity and diversity reasons (medical schools have an obligation to ensure admissions criteria are driven by access, equity and diversity)
  - to ‘right’ past ‘wrongs’ (i.e. restrictions in allowing Indigenous students to study medicine)
- for health workforce development (the role of Indigenous clinicians in the health workforce, the specialities that exist and the role the Committee of Presidents of Medical Colleges in changing work practice and priorities)
- to improve patient outcomes (there are considerable disparities in health care outcomes between Indigenous and non-Indigenous people; for example, the proportion of Indigenous people given an intervention for cardiovascular disease is much lower that non-Indigenous people)
- to impact on the medical curricula and the relationship between the student cohort and what is taught.

Indigenous students do not have an individual inherent right to be in medical school. However, medical schools do have an obligation to ensure admissions criteria (and retention efforts) are driven by equity and diversity criteria. Indigenous peoples, however, do have a right to be visible in medicine, medical education, and the broader higher education sector. Diversity is needed because it increases the range of possible outcomes and solutions for Australian Indigenous health. Not having appropriate representation by one group in the community — Indigenous people — limits the range of solutions that health care can provide.
There is a role for Indigenous clinicians in shaping the health workforce, especially for the
directions and priorities of Indigenous health services. This may assist in reducing the
unacceptable disparity in health outcomes between Indigenous and non-Indigenous people.
‘Racial’ and ethnic congruence increases positive outcomes for patients. However, we need to
take care as this argument is essentialist (i.e. that only Aboriginal people can treat Aboriginal
people) — we need a partnership approach instead.

The relationship between the student cohort, and the curriculum, is critical. There is an impact of
student cohort on the curricula that is taught (e.g. How would Aboriginal health and history be
taught to an Aboriginal-only cohort?). Medical schools at Newcastle, Flinders and University of
Western Australia have done work in this area, but there is no analysis of data on student
retention and completion. As with the rural context, Indigenous students may have better
retention rates and may be better in particular locations.

In conclusion, if we are going to actively recruit, we should be aware of why we are doing so,
how we are going to support Aboriginal students to completion, and be aware of the
environment they are being placed in.

3.4 International medical graduates and students

Professor Lesleyanne Hawthorne, Associate Dean, Faculty of Medicine, Dentistry and Health
Sciences, University of Melbourne and Ms Anna To, Research Fellow

The Health Workforce Australia National Training Plan has set a ‘self-sufficiency’ goal by 2025
for Australia, but our level of dependence on overseas trained health workers is extremely high
in OECD (Organisation for Economic Co-operation and Development) terms. We are currently
importing around 50,000 skilled migrants with health professional qualifications every five
years. This is in addition to people who migrate on a family or humanitarian basis, or as the
partners of skilled migrants. In the past decade Australia has increasingly recruited medical
migrants on a temporary basis, a major advantage being the potential to constrain their location
of practice (most notably in ‘areas of need’). In consequence, IMGs are disproportionately
employed in rural or remote areas. However, many of them leave after four years, leaving
Australia in a constant process of replacement. Skilled migrants are typically derived from the
United Kingdom, India, Malaysia, Philippines, China, South Africa, Korea, Ireland, Egypt,
Zimbabwe, Canada, Singapore, and United States. Loss of their medical workforce is a major
problem for some of those countries, particularly Malaysia, South Africa and Zimbabwe.

As demonstrated by Hawthorne’s recent study for Health Workforce Australia, there are six
main pathways for medical migration to Australia. Outcomes for IMGs derived through the first
three pathways are extremely positive:

1. New Zealand flows (via the Trans–Tasman agreement – associated with seamless transition
to medical employment)
2. international students (via the study–migration pathway, with 99% employed full-time in
   medicine at four months)
3. temporary labour migration (via the 457 visa — IMGs sponsored directly to jobs, with 99%
   employment rates at six months, noting this is typically with conditional registration, with
   many disproportionately likely to leave on completion of service)
4. permanent skilled migration (via the General Skilled Migration [GSM] program – at 18
   months of arrival typically doing well, with about 70% working in their preferred field)
5. dependents of GSM migrants (a high-risk group unfiltered in advance for human capital
   attributes, who may need considerable bridging into medical employment)
family and humanitarian category migrants (an even more high-risk group, again unfiltered in advance for English ability or registerability, likely to need considerable bridging into employment).

Using MSOD and CMSQ data, we found that the institutions where international students were initially enrolled were dominated by Queensland (426), Monash (367), Melbourne (328), NSW (308) and Sydney (218), although interestingly, students in Queensland often preferred to work in other states if retained once they had completed their course. The main source of countries for international students in the MSOD sample were Malaysia (610), Singapore (505), Canada (431), United States (109), and South Korea (73), with rapid recent growth in enrolments from Canada and the United States. Interestingly, the study found that Indian students enrolled in medical degrees were overwhelmingly permanent residents or citizens in Australia, as were Chinese students. There are only a very few students from either of these countries in courses for full-fee-paying international students.

In addition to international students as a source of supply, in the last five years, over 3000 overseas-qualified doctors are recruited as temporary or permanent skilled migrants by Australia each year, with a similar number of nurses arriving. There is no sign of this number lessening. Rather, the scale of arrivals has increased. Many such international medical graduates face serious problems, serving for years with various forms of conditional registration. In addition, thousands of IMGs arrive as spouses of migrant doctors, or as family or humanitarian category migrants. Their skills (their quality of training, registerability and their English language ability) are wholly unassessed in advance of migration. Many will take years (if ever) to secure medical employment.

Since 2008, Australia has established multiple pathways into practice for international medical graduates (fast track, medium and slow routes), with the first major barrier to acceptance being English language competence. For example, only 12% of 15,000 nurses currently pass the overseas English test, compared to 53% of doctors. If the English test is passed, the next hurdle is securing vocational registration, but this is a highly variable process. India has been a strong source of medical migrants for Australia over the last 20 years, but only a minority of recent arrivals have persisted through the Australian Medical Council examination process to secure unconditional registration. The 2006 census shows that, overall, 53% of 2001-06 arrivals were employed in medicine within five years (with conditional or unconditional registration). Those most likely to be employed were from South Africa (75%), other sub-Saharan Africa (71%), United Kingdom/Ireland (71%), Singapore (63%), Malaysia (62%), West Europe (62%) and India (61%); more modest performers were generally from Hong Kong (59%), Philippines (50%), West Europe (54%), south–east Europe (49%) and South America (40%); and particularly poor performers from east Europe (31%), Vietnam (23%), Indonesia (8%), and China (6%).

In 1999, international students became immediately eligible to migrate to Australia unless they were scholarship-sponsored by their government or some other body. This is an ethical bar where students have to go home to support their own health workforce. The great majority of international students however are privately funded. Compared to migrant health professionals, international students are greatly advantaged. Their qualifications are fully recognised, they have self-funded to train to Australian norms; they are exempt from English language testing; and, given that typically they are 23 years old when they graduate, their future productivity is likely to be exceptional relative to the normal age of overseas-trained doctors (40 years or more).

As noted, there is an ethical bar for the sponsored medical students, with many from Malaysia and Botswana required to return home to work for up to five or six years. Leaving aside
sponsored students, privately funded Malaysian students are largely of Chinese or Indian origin. The majority are motivated to study overseas because of the national *bumiputra* affirmative action policy in Malaysia which favours native Malays. This is reported to disadvantage other ethnicities at point of entry into medicine degrees and in subsequent practice. Such students typically want to stay in Australia and many of them do. The drivers for Singaporean students are reportedly employment conditions and hours of work back home relative to Australia. For Canadian students, who are here in large numbers now, the migration pathway, access to internships, benign weather and diasporic family links to Australia are reportedly major attractors.

There were some very interesting findings related to the medical ‘Study-Migration’ Pathway: Graduate Destination Survey (2006–10) analysis undertaken by Hawthorne & To, to compare to the MSOD data. While just 53% of overseas-trained doctors are working in medicine within five years, 99% of former international medical students have full-time medical employment within 4 months (near identical to the domestic student rate of 99.7%). These are completely atypical results for international students who qualify in Australia across all fields. The typical outcome is that former international students earn $20,000 less than local graduates 6 months after skilled migration, despite qualifying in Australia. It takes them far longer to get employment in their field.

In terms of the MSOD data, in their first year of study when international students were asked where they want to start their medical career, 55% said they planned to work overseas compared to just 6% of domestic students. International students also wanted to work in capital cities and major urban centres. By their final year however there had been a radical transformation: 78% of international students had accepted PGY1 places in Australia and were intending to stay. Typically, they chose Victoria (35%), NSW (17%) and Queensland (14%) followed by Western Australia. In terms of retention in Australia by institution, for Australian National University, Western Australia, Griffith, Bond and Flinders, 100% stay in Australia. For the University of Sydney the rate was 95%, Melbourne 76%, Queensland 92%, and Monash 62%. The key issue in the differences was level of student sponsorship.

The students most likely to stay were the Canadian and American students (92%) reflecting the fact that these students were on the whole self-funded, and desperate to secure PGY1 places (with residency access uncertain back home. Marital or relationship status was also a major factor — if students had a partner in Australia they were more likely to stay.

The study also examined where students were doing their postgraduate year 1 (PGY1) rotations and it found that they were most willing to work in rural locations and in places that were relatively undersupplied for work. 62% had accepted such places.

A key issue for Australia will be retention. It is very clear that countries such as New Zealand and Singapore are keen to recruit international students qualified in Australia if they are not allocated internship places here. These internship places are the critical bridge to skilled migration. If Australia does not provide internships to international students they will be compelled to go elsewhere, where they are likely to establish their careers. There is also growing competition between IMGs who are seeking full medical registration in Australia (requiring supervised clinical places), and former international students. This will be a key challenge for the government to resolve in the context of the HWA National Training Plan.
4. MSOD — The next steps

4.1 Translating research outcomes into policy

Professor Nicholas Glasgow, Dean Australian National University; Chair, MSOD Board, Treasurer, Medical Deans Australia and New Zealand

In classically academic research, when research results have been disseminated, the researcher moves on to another research objective. But if research results are to be adopted they need to be put into practice and this often comes about through uptake as government policy. However, policy people think in very different ways to academic researchers. Policy people have to make a wide range of decisions and have to think through a whole range of issues, through different perspectives, to come up with a policy. If academics are going to make sure that research is of value to the policy people, they must understand the real world of politics.

There are three broad ways that research can interact with policy. One is the ‘producer-push’ where the research thinks up an idea and then provides the results to policy makers. This is easy, but this kind of linear thinking is not particularly helpful. Then there is the ‘user-pull’ where governments or agencies related to governments commission research to answer a particular question. The difficulty with this is that the way that a user shapes a question might not be ideal for the way a researcher might set up the research methodology. The third way — the co-production of knowledge with both researchers and policy makers involved from the outset — is the most productive.

Research can be adopted in various ways. For example:

- directly (the use of research, such as immunisation research results, being used to shape policy)
- symbolically (where research supports an announcement but has nothing to do with the development of the policy; this is about policy makers using research to support the policy direction they want to go in)
- through enlightenment (policy problems are difficult issues, but research and policy makers working together can lead to new ways of constructing or approaching a problem).

The direct use of research where a research result directly shapes policy (e.g. immunisation) is unusual. With symbolic adoption, a politician might find fortuitously that a research finding supports an announcement they want to make, but that probably has nothing to do with the purpose of the research—it is just an opportunity for the politician to recruit another bit of evidence to support the policy direction they want to take, or not want to take, and it may be good, or not so good, for the researcher.

Policy problems are often very difficult issues with no right answer. In this case, researchers, rather than actually solving the problem, might come up with new ways of considering the problem, and that can be a very important part of the interactions.

Professor Sally Redman, Honorary Professor, School of Public Health, Director, Sax Institute

Public Health, School of Public Health

It is important to have a rigorous evidence-based approach to public policy in Australia and the goal of the Sax Institute is to increase the use of research in the development of policy. Evidence from research can be very helpful in determining policy in three ways: (1) it can help set the
agenda; (2) it can inform decisions about specific programs and policies; and (3) it can demonstrate the impact of policies and programs. However, evidence from research is always only going to be one part of what informs government decisions.

Many opportunities to use research evidence are currently missed and there is a lot that we could do better; what is needed is a process of closer engagement and understanding because policy makers operate with a completely different set of drivers than do researchers. For policy makers, there seems to be a huge amount of research out there (and there is!), so we need to get much better at providing syntheses of information so it makes sense to policy agencies. Policy-makers work in very short timeframes, whereas researchers work with much longer timeframes. There is also the issue that researchers might feel compromised if they interact too closely with policy-makers who they fear might tell them what the results should be or prevent researchers from publishing. For policy makers, working with researchers can be complex and some areas of research are potentially confusing. Policy makers can also say, despite all of this investment in research, when they actually go to find a piece of evidence to support what they are saying, it is rarely actually there.

If researchers are interested in having their work adopted by policy makers, these barriers need to be addressed. Across the world there have been many attempts at finding solutions to these problems (for examples: access to research findings; organisational strategies; training for researchers; training for policy makers; structured exchange; partnership research; and building research expertise inside policy agencies). However, little is known about which of these are effective.

Cohort studies have a particular capacity to fill some of the needs that we see in policy development. Policy makers want research that is timely, they want research that is relatively inexpensive, research that relates to the local environment and high-quality data have the potential to fulfill all of these requirements. Cohort data are usually high quality, locally relevant, timely, inexpensive and useful for guiding action. The ‘45-and-up’ study, which is a large population-based cohort examining healthy ageing, is a collaborative, open resource, designed to be used by a range of agencies (at the moment about 100 agencies are using the data), and is a good example of how policy makers, researchers and practitioners can work together effectively to improve healthcare outcomes.

Experience at the Sax Institute in working with policy agencies has found that long-term research programs, where policy agencies, researchers and other stakeholders can work closely together to inform each other and grow the program over time, are much more likely to be more effective than short research projects. There will be more uptake of findings if the policy agency is engaged early in defining the questions and in all subsequent stages of research. This requires new methods of doing business between policy makers and researchers, and new systems, which are best supported with high-level written agreements. In the 45-and-up study there are regular face-to-face meetings, annual collaborator meetings and brokerage, where close discussions are held about what questions might be asked within the study, at either the request of policy makers or researchers.

Methods to enhance the uptake of research findings by policy makers include:

- taking a closer partnership approach — long-term partnerships between researchers and agencies, where ideas for research are generated together, ideas and information are exchanged and the research program is progressed collaboratively, are more effective
- engaging early — informing the policy agency (via face-to-face meetings and/or annual collaborative meetings) when generating research questions and in all subsequent stages of research so that they are aware data is coming
• not taking research results to an agency — ‘transfer’ of research findings at the end of a project is less likely to be effective
• providing for brokerage — when an agency thinks data may be useful, working more closely with them, at their request or visa versa
• using written agreements — these are helpful because each party can have different expectations about how things are done.

4.2 Future challenges for medical education

Mr Robert Wells, Director, Australian Primary Health Care Research Institute and Menzies Centre for Health Policy, Australian National University

Society confers a high level of status on doctors which brings with it a number of benefits to the medical profession: heavily subsidised training; a lifetime career; a high degree of self regulation and self management; and a system that is largely responsive to doctors’ needs. In return, the profession in Australia provides world-class healthcare, which is what the population wants. This forms the basis for a very strong and good social contract. This social contract, however, means that society expects medical schools to train doctors who are competent and provide care to accepted standards, and who understand and can work well in the healthcare system. Society expects the medical profession to establish and run medical research. So medical schools have a social responsibility, not just to medical students and graduates, but to society as well. And Medical Deans accept this; that medical schools have a social responsibility, other than a clinical or professional responsibility, to provide a medical workforce that met workforce needs, if only in their state or region. Most accept a responsibility to have a mix of students — at least to have a gender balance — that more or less reflects the mix of society, specifically to attract and support Indigenous medical students.

There have been major changes in medical school approaches over the past 20 years. In the 1980s, only one or two medical schools had graduate entry whereas about half of them have it now. Clinical training for students was only provided in the traditional teaching hospitals; now it is provided in rural areas, and it’s provided in non-traditional teaching hospitals and in general practice. We now have bonded students and while this concept was seriously questioned 10 years ago, it is well accepted now. There has been a doubling of medical schools and a trebling of students (there were only 10 medical schools in 1997 and now there are close to 20). Consequently, now there is a pressure on intern training place to catch up with producing 3000 medical graduates every year.

The new challenge for medical schools is to equip doctors to work in a health environment dominated by chronic disease and ageing. This shift has occurred relatively quickly. There is now also a stronger interplay between health and social issues, especially with mental health. There are expanded roles for other professionals, such as nurses and allied healthcare professionals, especially in primary healthcare. Working in teams in primary care is now popular, and we need training to support that.

The health policy environment is also now changing rapidly, with policy decisions being rapidly reversed in some instances. There are now also new structures in which doctors will have to play lead roles, and new funding models beyond the traditional fee-for-service paradigm. There is now stronger pressure for doctors to work where they are needed. We have had a decade or so with incentives, but it doesn't seem to have worked. We have dragooned an overseas workforce to do much of the rural medical work that we think needs to be done. This is a strong issue, which does not go away and does not seem to be being fixed.
So where does this link to MSOD? MSOD provides a unique source of data on medical workforce and will into the future if it continues to be supported. It not only informs about the aspirations of students, but it can actually follow actual career directions. So we will know a lot more about the workforce, and the backgrounds of students, what sort of training programs are more likely to produce a workforce that is more flexible and more likely to work where the demand is than where they would prefer to work. This will help us understand the workforce, but is that enough? Will the information help us understand and fulfil the social obligations? Will the Medical Deans look at research that gets back to some of the broader social issues: how medicine fits into the reforming system; how society is responding to having doctors and nurses and maybe other health professionals in roles that seem to overlap and people are not too sure who they should approach if they have a particular problem? MSOD is a start, but I would like the Medical Deans to start to think about what other research we need to do, if indeed the medical schools are going to continue their fine tradition of fulfilling a very clear and unique social responsibility.
5 Technological innovations and MSOD

5.1 The Australian Medical School Mapper project

Dr Ian McRae, Australian National University, College of Medicine, Biology and Environment, Australian Primary Health Care Research Institute; Mr Paul Konings, Spatial Scientist, Australian National University, College of Medicine, Biology and Environment, Australian Primary Health Care Research Institute; and Danielle Butler, Australian Primary Health Care Research Institute

The Australian Primary Health Care Research Institute was commissioned by Medical Deans to examine MSOD data from 2006 to 2010 and create an online mapping tool which would allow universities, policy makers and other stakeholders to reveal the regional source footprint of medical school applicants, and the intention to practice in urban or rural areas of all medical schools applicants. These footprints and intentions to practice were to be analysed by area, university and background factors such as rurality.

The MSOD data had commencement information for every student who joined a medical school from 2006 to 2010. Information was available on which medical school they attended, which high school they had attended, where they intended to practice (urban or rural areas), and whether they thought their background was rural. Considerable effort was put into ‘cleaning’ the data, particularly in terms of ensuring consistency in responses which varied because of the use of individualised nomenclature (e.g. names of schools). As well as their high school, students were asked if they were of urban or rural background. However, when high school data and the student’s view of their background were compared, there was a fair degree of inconsistency. In this, the students may have been right (i.e. having a largely rural background and finishing high school in an urban area, or vice versa), but care is needed in interpretation of this data. The medical school data originally comprised 28 schools and this was divided in terms of undergraduate and postgraduate programs, and some schools were combined, giving 23 medical schools.

The ‘Health Landscape’ software, which is managed by the Robert Graham Centre in Washington DC, was used. It allows a considerable, though not infinite, amount of flexibility in mapping. The website is menu driven and it is easy to move from one view to another. It is set up with filters which can be sequentially applied to narrow down a search, or overlay or underlay data. It also includes some aggregate data which can be observed. The data can be placed in any geographic structure — statistical local areas, statistical subdivisions, postcode, census, or mesh blocks, for example. Results are presented as maps with details shown graphically according to the attribute selected (e.g. locations of medical schools, and details about each schools, public/private school mix, degree of rural students, level of international students, where students come from (nationally and for specific areas), and where students want to go).

In conclusion, this software will be increasingly powerful and useful for student and workforce mapping as the MSOD dataset expands over the next five years.
5.2 GeneRic HeAlth Network Information Technology for the Enterprise (GRHANITE™)

Dr Douglas Boyle PhD, FACHI, Head, GRHANITE™ Health Informatics Unit, Rural Health Academic Centre, Melbourne Medical School, University of Melbourne

The Health Workforce Australia report *National Health Workforce Innovation and Reform Strategic Framework for Action 2011–2015* recommended, for health workforce planning, the development of an authoritative National Statistical Resource that brings health workforce related data and information from a variety of sources together at a national level to underpin future workforce planning across the system. The MSOD data is an excellent resource. However, it could be enhanced dramatically by bringing it together with other data sets. There is a large number of agencies involved in health workforce planning and the collection of statistical information. The key challenge in using data from any of these sources is determining what data can be brought together, and under what circumstances (e.g. some of the databases are controlled by legislation). The major problem with access to other data sets is maintenance of information privacy, and the GRHANITE™ system could be used to overcome this difficulty. While many people see privacy laws as a barrier, they should be considered an opportunity for Australia to create better tools which allow researchers to work within very tight legislation.

There are different ways of looking at data (e.g. individualised or aggregated), but to get longitudinal information and access to more complex analyses, record linkages are needed. The possible data parameters for linking datasets include medical student number, Australian Health Practitioner Regulation Agency (AHPRA) registration number, provider number, surname, date of birth, gender and country of origin.

Traditional medical dataset linkage uses de-identified clinical data for research; a third-party organisation is given identifiers and deals with linking the data together. However, some national organisations will not allow identifiers to be released to anyone, even third-party agencies. A more recent system therefore uses a non-reversible mathematical technique to generate statistical linkage keys so that research can be done using these numbers without knowing who the individuals are in the first place (e.g. John Smith = 823y8734dhjck348hecj3847h898jx8weud8eemazaks ^&%11==). Very common names (e.g. John Smith) are dealt with through probability estimates and advanced phonetic encoding can ensure a significant percentage of spelling mistakes are captured. Similar techniques can address date errors such as an inaccurate year of birth.

This system gets around most privacy barriers so long as there is a way to guarantee the data cannot be converted back into the original identifying names. While the technique is irreversible, there are still people who are skeptical about it because, where you have humans involved, there is potential for error or abuse.

The work at the Health Informatics Institute over the last five years has focused on providing an advanced tool (GRHANITE™) which allows the Institute to provide a service using this type of linkage system and to work with health professionals to validate mechanisms to overcome ethics and privacy constraints and manage issues such as data oversight. GRHANITE moves the required information between two different places, and the data can be previewed to check what is being transmitted via the internet. About 120 laboratories around Australia are already using it. There are other record linkage tools available, but it is important to get the right tool for the specific research situation. Because there are different organisations already performing record-linked research, they have an investment in their infrastructure. These different organisations have dealt with the complexities of obtaining their data for research and there are benefits in
building on those resources. The future of record-linked research will require collaboration and the use of more than one technique for record linkage.
6 NSW government support for medical education and training

6.1 NSW government

The Hon Jillian Skinner MP, Minister for Health and Minister for Medical Research

The NSW Government has a strong commitment to medical training: doctors are integral to the healthcare system and high-quality healthcare demands that they are extremely well trained. Data sources such as MSOD are very useful for policy makers as they allow for an assessment of career aspirations against workforce needs. As increasing numbers of graduates enter the medical workforce, specialist training positions need to be created to ensure these graduates train in the medical specialties required to meet patient needs. The NSW Government recognises the need for a training pipeline for medical graduates. As part of the 2012 budget, the government has allocated new funding of approximately $21 million over four years to expand postgraduate medical training in NSW. The government will also provide intern funding of $11.2 million over four years with $2.8 million allocated to support local health districts — the new devolved part of the health system — to create additional intern training positions each year. The Ministry of Health is currently conducting an expression-of-interest process to allocate the funding across each of the local health districts. NSW has 850 intern training positions available in 2012. The Clinical Education and Training Institute — soon to become the Health Education and Training Institute (HETI) — advises that to date all domestic graduates of NSW and interstate universities who applied for an intern training opportunity have been allocated a position. Allocations are currently being made to full-fee-paying international graduates of NSW universities; as at 28 October, only four were still awaiting positions. The intern allocation process will continue until December.

In addition to allocation for intern positions, new funding of $7.2 million over four years has been allocated to establish extra medical specialist training positions. As with the intern funding, an expression-of-interest process is underway. NSW Health will continue to expand specialty training positions to align with workforce needs. Priority will be given to expanding specialty training opportunities in areas which have previously experienced workforce shortages, such as rural and regional hospitals and those specialties which have experienced difficulty in attracting domestic graduates, such as general medicine, geriatric medicine, general surgery and palliative medicine. Medical specialist training positions also need to be accredited by the relevant medical specialist college. The Ministry of Health will be seeking advice from those colleges on the accreditation status of the new positions that are to be funded under this new medical training expansion.

The NSW Government has also allocated $3.9 million over four years to support the establishment of medical specialty training networks. This funding recognises that medical training is best delivered through a network of training sites to allow doctors to gain experience across a range of metropolitan, rural and regional health facilities. The places most in need of support in this way are the smaller institutions and the regional institutions in country NSW. This new funding will be used to support the establishment of rural and generalist training networks, networks for radiology training, emergency medicine and general medicine.

Funding has been allocated as part of the 2012 budget to develop and support the infrastructure required for development of the NSW rural generalist training pathway. This builds on the support already provided for medical postgraduate training in NSW. It includes recurrent
funding of over $8.5 million per year to support medical specialty training networks administered by HETI. This funding support training networks for prevocational training, basic physician training, pediatrics, psychiatry, cardiology, oncology and surgery. It also included funding of $4.5 million per year to the medical division of HETI to support postgraduate medical education and training.

The government has also provided funding of an additional $6.8 million per year for additional postgraduate year 2 and 3 training positions in rural and regional areas and $3.9 million for 21 vocational training places. This funding arose from the recommendations of the commission of inquiry into acute care at public hospitals (Final Report of the Special Commission of Inquiry into Acute Care Services in NSW Public Hospitals, Peter Garling SC, October 2009). Funding of $6.9 million per year provided to HETI to develop an inter-professional new-starter training package has also been allocated. HETI is developing this program under the team health brand; interns and specialist health trainees will benefit from this program as it is rolled out across the local health districts.

The availability of longitudinal data on health graduates (MSOD) is an important element in the development of comprehensive workforce plans. A workforce plan requires two key elements: (1) a demand element, in terms of the healthcare needs of people; and (2) a supply element that takes into account graduate numbers, their career aspirations and available training opportunities. MSOD is seen as a useful dataset to inform the assumptions around workforce supply. The Director General of Health for NSW has convened a taskforce to develop a health professionals workforce plan for 2012 to 2025. The taskforce is currently consulting on a discussion paper which will inform the development of workforce strategies which considers the vertical integration of training needs.

In conclusion, the NSW Government will continue to grow postgraduate medical training to meet the needs of patient care. Between 2006 and 2011, the number of specialist trainees in NSW increased by 25.7%. During this time, the number of rural specialist trainees increased by 36%. The new funding outlined does not include the additional training positions funded by local health districts. The NSW Government has given those local communities and districts the opportunity and responsibility to plan and deliver their health services in line with local community needs. As part of their own organisational growth to support service delivery, local health districts have also been delegated the responsibility of growing their medical workforce to meet current and future service requirements.
7 Summary of issues and implications for MSOD

7.1 The importance of continuing the MSOD project and MSOD needs

- Funding — A number of delegates to the Forum noted that the MSOD project had now reached a point where the data was becoming extremely useful and researchers were only just starting to get value from the project. MSOD is now the Australian Government's main data-collection tool for medical student information and it is the primary data source of data for the National Training Plan (NTP) for medical student enrolments. Combined with other datasets, MSOD has considerable potential for expansion and in-depth modeling. Given that Australia has a goal of medical workforce self-sufficiency by 2025, MSOD will be an increasingly important tool in workforce planning. In noting the success of MSOD, and its future importance, delegates expressed concern that the project did not have certainty of long-term funding. Support by the Australian and state governments, medical schools and colleges, and other direct stakeholders, needs to be assured. In addition, more diverse opportunities for funding are needed to maximise the benefits that the database can provide.

- Collaboration and linkages — There is a need for linkages between FRAME and MSOD surveys so that there is one incorporated FRAME/MSOD survey questionnaire (noting also that it is uncertain whether the FRAME questionnaire will continue because of lack of funding and because Dawn DeWitt, who has been running the project, is leaving Australia). We have now the MSOD minimum data set for surveys on entry and exit; we have the FRAME survey which we have been running separately. We now have linkage opportunities to allow validation of MSOD and to look at detailed data on preferences and factors. GRHANITE privacy software, if installed at each medical school and at national registration, could allow detailed follow-up. Once we get into other national datasets, we would have the best outcomes and workforce predictor research in the world.

- Research methods — There are quite a few projects now completed or in progress using MSOD data. However, it is important to hear about not just results, but about methods also. It would be good to have a central collation of not just the findings but the methods, the contact people, what they were planning to do, etc, so that we can get more cross-fertilisation between researchers.

- Benchmarking — Because we have so many diverse medical schools, interesting cross comparisons are possible — which schools are doing some things well and which are not, etc.

- New Zealand data — How do we get New Zealand into the picture? How do we get funding to get both datasets together? We have been liaising with Health Workforce New Zealand and they are interested in looking at international students as a source of supply. HWA has just established an international recruitment section. We have both a Health Workforce Australia and a Health Workforce New Zealand, so it is the perfect opportunity to look at all sources of supply, medicine, nursing, etc, for the two countries. Medical Deans bridges the two countries and could help facilitate more collaboration and discussion to help develop a strategy for comparing data between the two countries. It is difficult to use Australian Government funding for work in New Zealand. However, there are some opportunities emerging in both countries to collaborate.

- Response rates and longitudinal tracking — The challenge for MSOD is to keep it going and to keep the response rates up. Ideally we can follow these students as they go into
practice, but that will take a lot of effort from people who are very busy. We may need to
graft on data from other agencies (e.g. annual registration process) to keep following these
individual longitudinally because that is where some real power will come for the dataset.

- Student engagement — From a student perspective, it is very exciting to see the work
resulting from the surveys, but keeping students engaged in this process is going to be
essential to maintain the flow of data.

### 7.2 Medical workforce planning issues

- MSOD has become a highly valuable tool for medical workforce planning. However,
because of the difficulty of making predictions about medical workforce needs, we must
ensure that workforce planning activities are flexible and responsive, and are based on how
we believe those needs will be in the future, not on present day needs.

- There is a lot changing in medical practice, such as preventative healthcare, ambulatory
care, care closer to home, new procedures and, in particular, new workforce paradigms
(e.g. health teams, nurse practitioners, allied health practitioners). Doctors’ roles are being
redefined and new technologies are allowing doctors to delegate many procedures to other
health professionals, and this will have an influence on Australia's future medical
workforce. These changes can be tracked by MSOD.

- While we cannot impose career choice on Australian medical graduates, medically trained
people are greatly needed in certain areas (especially rural, remote and Indigenous
healthcare). We need information that will motivate people who undertake medical training
to work in those areas where there is greatest need. The way in which MSOD can contribute
to this should be examined.

- Data have shown that there is an increasing number of specialists relative to generalists in
the medical profession, and that Australia is increasingly lacking in generalists. However,
there are specialist shortages in certain areas (peri-urban, rural and remote). There is a lot
more work to be done on specialist mapping to find out which areas of specialisation have
the greatest need, and where.

- We must also better understand how to provide appropriate training paths and recognise
prior learning, and having a training framework that allows people to move from generalism
to specialism, and vice versa, with reasonable flexibility.

- Specific student characteristics are associated with an interest in pursuing a career in
general practice (i.e. students who are older, female, married or living with a partner, have
dependent children, have dependents other than children, were born in Australia, do not
speak a language other than English at home, were raised in a rural location, and were
enrolled at a GP-focused university, are more likely to express a preference for general
practice). Identification of student characteristics associated with pursuing a career in
general practice and targeting those students may assist in alleviating the shortage of
general practitioners within Australia. Further research could be carried out through MSOD.

- In some areas there is insufficient capacity for training and medical student teaching. This
also needs to be mapped through MSOD.

- The current shift to graduate medical degrees (i.e. completion of a generalist degree before
enrollment in a specialist medical degree) needs to be monitored to determine whether it
brings a better healthcare results.

- An ‘education card’, where a student is issued with a card and each school they go to is
funded for training services, needs to be explored.
• The Australian HECS debt can be retired in two years if a medical student goes to work in a rural area. The roles that education debt load and incentives for repayment of debt play in career choice need to be further examined.

• The personality profiles of students play a small but potentially vital role in career choice. Relatively subtle but potentially important differences were found between students intending rural vs urban practice and between generalism vs other forms of practice. The role of personality in career choice needs further study and this could be done through MSOD.

• One third of medical students are initially looking at academic careers but we know from trying to recruit them that in the end they do not continue with this intention. We need to understand what happens in between enrolment and graduation which prevents that outcome. MSOD could contribute to this.

• We do not have a clear academic path in the medical profession. We talk about PhDs and we talk about specialisation, but we do not talk about the senior lectureship years. We need consider a college of clinical academics to have a clear path for someone who wants to be a clinical academic.

• MSOD data could also assist at the postgraduate level, for example to quantify the level of interest of clinical academia around postgraduate trainees.

• Medical schools in Asia (particularly Malaysia) have recognised the fact that medical students are over-focused on technical matters and have lost contact with the humanities; these universities are trying to bring this back into their curriculums, as well as emphasising the social contract. Australian medical schools should address this issue as well.

• There is the trade-off between PGY 1 and 2 graduates being part of the workforce versus getting education and training. It is supposed to be two years of prevocational education and training. If there is not any education, and only a bit of training, then that hiatus can be really damaging. A related question, especially in PGY 2 which is the period when people get to the point of committing to a career decision, what opportunities are there for them to do non-core options? It might be very different in different environments, especially in rural environments. What is available or not available might make a big difference to where people go. It is not clear how MSOD could directly address these issues (although MSOD does collect PGY 1 and 3 data). Making sure we collect the right data so that we can inform college strategies and processes is critical.

• An advisory council needs to be formed through which a broad range of stakeholders could be represented (including students and junior doctors) to consider medical workforce issues and present them to government, preferably through COAG. This needs to be a true partnership. Health Workers Australia has been formed, but that is not performing the function we are suggesting here.

• In terms of utilisation of the healthcare system for early clinical placements, there are data which show that about 16,000 days of the healthcare system are used by medical students in the first half of the course for probably rather dubious and not well thought through mechanisms. At the same time, we are desperately short of placements for senior medical students. It is not just the long-term information that is valuable; there are some interesting cross-sectional matters that we could look at that would be useful to medical workforce planning.

• Data on changes in preferences between entry and exit are critical to knowing what students experience and how the curriculum is delivered and shaped. Factors influencing changes in preferences should be explored.

• Key questions included:
How can we better address the isolation issues to shape workforce outcomes?
How will society respond to doctors and nurses and other health care professionals having overlapping roles?
What other research is needed if medical schools continue to have clear and unique social responsibilities?

Key areas for further research included:
- Education for specialists (e.g. medical colleges require multiple subspecialist support for a general medical advanced trainee).
- Cost-effectiveness analysis (e.g. the costs of recruiting an overseas trained doctor for rural areas versus putting in better training facilities in rural areas).
- Analysis of teachers and supervisors and the learning outcomes of the vertical and horizontal integration model of supervising more than one learner.
- Understanding the role of mentors and role models as the biggest shapers of career choice.

7.3 Rural health education issues

- While it is clear that there is a ‘rural background’ effect (i.e. people of rural background are more likely to work in rural areas following graduation), despite recent studies as to the cause of this phenomenon there is still little understanding of drivers at an individual level. Further effort is needed to understand the factors involved in why people choose a rural-based career and how that information could lead to policy changes.
- The role of personality and temperament in students’ initial intention and subsequent decisions around medical career choice early in their career was a pilot study only, and therefore a broader survey is warranted.
- Students with a rural interest are a mixture of ‘types’, including those who are technically oriented as well as those who are people oriented. We need to understand how this influences policy in relation to selection and to curriculum.
- There appears to be a high level of indicative interest in a rural medical career (e.g. multivariant cluster analysis showed that some 38% of students would prefer a potential rural career), yet this does not appear to translate into graduate uptake of rural medical careers. This needs to be further explored through MSOD.
- It is of note that students from rural high schools are interested in training in rural areas. Perhaps there is scope for research on some innovative models of recruitment, supervision and specialist training in rural and regional areas in the future.
- The restraints to increased uptake of rural placements include lack of opportunities for partners. Finding employment for spouses or partners of doctors in rural areas is a significant issue that needs robust research. Similarly, isolation issues for medical students and graduates in rural areas need to be addressed.
- Despite a general view that rural practice means general practice, in one study, only about 33% of students intending rural practice nominated generalism as their preferred type of practice. Given the need for generalists in rural areas, this needs to be explored further.
- Rural clinical school (RCS) graduates want clear postgraduate training tracks, including those for specialties other than general practice, in rural environments. In order to meet the workforce shortage goals, students need to see RCSs as academically excellent supportive environments and they must see clear career trajectories. The role of the newer regional
medical schools urgently needs to be evaluated in this context (the FRAME study provides baseline data and a mechanism for comparative research).

- There needs to be clear pathways to rural practice that are written down, advocated and marketed very clearly so that when a student says that they want to follow a rural pathway, it is very clear what they need to do. A question that could be added to the MSOD survey questionnaire is, “if you have a rural intention, do you know what the pathway is?” What you can get, how you can get it, where you get it from, etc.

- A specialty academic training pipeline is needed for at least half RCS students. A proposed solution made to this was to set up a College of Clinical Academics offering 20 fellowships for five years and set a clear rural path for students wanting to pursue this.

- Students from rural schools who are interested in specialty training in rural areas need to be catered for. There is scope for this in the future — RCSs have shown there are alternative models that can work. Funding is needed to support specialist training in rural areas.

- Working in rural or remote areas can be isolating and this can deter students; students with a rural background fare better because they know their way around.

- While a disproportionate number of overseas-trained doctors are being located in rural areas, they generally cannot and do not want to teach. This is significant in light of the fact that we are heading into a dramatic increase in numbers of medical interns and post-graduates in rural areas.

- Traditional models of intern teaching cannot keep pace with the number of interns needing supervision, and other, more doctor-efficient models need to be examined.

- The mining approach in Western Australia was given as an example of a fly-in–fly-out workforce that rotates on a seven-day cycle. Can the medical workforce for rural settings learn from this strategy? This needs to be considered.

- Cost-benefit analyses show that increased funding is needed to train rural graduates compared with urban graduates. This needs to be recognised and supported.

- It might be possible to access alumni data from rural schools to track who goes where.

### 7.4 Indigenous health issues

- Indigenous health practitioners still only represent a very small proportion of the Australian health workforce (about 0.2%) and there is an urgent need to increase the number of Indigenous health practitioners. However, active recruitment of Indigenous medical students by universities can be seen as self serving. It is therefore important to closely monitor educational outcomes for Indigenous student enrolment, and make a distinction between recruitment and retention of students. At the moment only statistics on recruitment are collected. In addition to statistics on retention, MSOD should collect data on completions, graduations and medical registrations. In obtaining this data, it will be important to link Indigenous medical student recruitment and retention patterns to Indigenous support and Indigenous health education resources available at medical schools.

- Knowing what leads an Indigenous student to get into medical school will determine the next stage of their progress, but we are not sure where it all starts, therefore it is difficult to analyse how best to promote and support Indigenous students. This data also needs to be collected.

- There have not been any studies carried out on a national scale on the Indigenous medical student population. This will be significant for developing recruitment and retention programs, funding, and future research. It is expected that the findings will be a preliminary
step in developing a national evidence base for Indigenous medical student recruitment and retention.

- We need to examine the reasons why we want to recruit medical students and the link between having Indigenous students in medical education programs and the importance of having curricula to support them. The impact of the current medical school curricula on Indigenous students needs to be examined, as well as gaining an understanding of the relevance of the current curricula to Indigenous medical students.

- While increasing positive outcomes for Indigenous patients is important, there are not enough Indigenous people to fill roles in Aboriginal Health Services; a partnership approach is therefore needed.

- Indigenous students may do better and have higher postgraduate retention rates in particular locations. This needs to be examined.

- If we are going to actively recruit Indigenous students, we should be aware of why we are doing so, how we are going to support them to completion, and be aware of the environment they are being placed in. MSOD could assist with this.

### 7.5 International medical graduates and students issues

#### International students

- International medical students have become an important Australian health workforce resource, who are positioned to make an impressive contribution in the future. However, the contribution of international students and other medical migrants needs to be examined in more detail in the light of the Australian Government policy of self-sufficiency by 2025.

- There are ethical issues surrounding the retention in Australia of international medical students derived from countries which need those doctors to return home to support their own medical workforces (e.g. from Asia and Africa). A position on the ethics of international student retention and recruitment into the Australia healthcare workforce needs to be articulated. The ethics of revenue streams associated with international students also needs to be examined. It is important to note however that Australia already bars the retention of students sponsored by governments (e.g. Malaysia, Singapore and Botswana), who must return home to serve for extended periods. Second, there are arguably fewer ethical problems associated with retaining private international students than doing the OECD norm – recruiting international medical graduates (IMGs) aged 35-45 years, whose education has wholly been resourced by their source country.

- The reasons why international medical students remain in Australia after graduation, or leave, are complex. Key factors include whether they are bonded to their country-of-origin government (and therefore must return) and, more importantly, whether the remainder are offered clinical training and internship placements.

- A large majority of international medical students prefer to practice in metropolitan areas, but not all (62% serve in PGY1 in regional sites). It is important for Australians to examine in detail the issue of retention of these former students, including access to and following their intern year, and look at ways to make it easier for them to stay in Australia, although the moral issue should be a dimension in any such study.

- Research on retention of IMGs after PGY 1 is required to understand more about how these doctors can be retained and what their needs are. For those who stay in Australia, it would be interesting to track how long they stay, where they practice, in what locations and in what fields.
• The degree of difficulty former students face in getting clinical training and internship placements should be carefully monitored. Many cannot undertake clinical training in their source countries, and risk being in an invidious position if unable to do so in Australia.

• Analysis of the Graduate Destination Survey demonstrated exceptional immediate employment outcomes were achieved by international medical students remaining in Australia from 2005 to 2010 (99% employment rates at 6 months). We need to have a better idea of what the longer term employment patterns are for international medical students graduating from Australian medical schools. MSOD could assist with this.

• There is a need for a medical council to be funded which would bring together all relevant organisations and other stakeholders to, inter alia, consider matters relating to international students.

• There needs to be a policy decision made at government level about international students’ access to internships, in a context where they will increasingly compete for training with domestic students, and with international medical graduates who require supervised positions to secure full registration.

• Should Australia facilitate the rural experience for international students as well as for local students, given the great majority currently remain (around 78%), with many securing regional PGY1 places (25%)?

Overseas-trained medical professionals

• Australia's level of dependence on overseas-trained medical professionals is extremely high. These IMGs are often accepted on a temporary four year basis, an advantage being that work in an under-supplied site can be made a condition of visa status. Such IMGs are disproportionately employed in rural or remote areas. However, a disadvantage is that many of them will leave after four years and so Australia is in a constant process of replacement, especially in rural areas.

• The two major barriers to acceptance of overseas-trained medical professionals are English language skills and registerability (most work first under various forms of conditional registration). Thousands arrive as the spouses of migrant doctors, and as family or humanitarian category migrants, with their medical skills and English wholly unassessed in advance. This places a considerable assessment burden on administrators, and applicants, and leads to serious skills wastage. For example many do not pass English language tests, even after numerous attempts.

• Migrant doctors need to understand how the health system works, and this is one of the problems we have with migrant medical professionals — they are not trained to understand our system. The extent to which this impacts on Australia’s healthcare system is unknown and needs to be studied.

7.6 Other matters

Providing input to policy formulation

• There is considerable potential for data to influence policy, but often there is not a linear response between evidence and policy for development. The important thing is to have the evidence available so that when the opportunity arises, advantage can be taken of it.

• Ways that researchers can enhance the uptake of research findings by policy makers include:
- having a close partnership approach (long-term partnerships between researchers and agencies, where ideas for research are generated together, ideas and information are exchanged and the research program is progressed collaboratively, are more effective)
- engaging early (inform the policy agency via face-to-face meetings and/or annual collaborative meetings when generating research questions and in all subsequent stages of research so they are aware data is coming and their input is needed)
- not taking research results to an agency (‘transfer’ of research findings at the end of a project is less likely to be effective)
- including brokerage (when an agency thinks data may be useful, work more closely with them, at their request or visa versa)
- having written agreements (these are helpful because each party can have different expectations about how things are done).
# Appendix — Participants

<table>
<thead>
<tr>
<th>Name</th>
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