

FINAL

The Australian Pathology Workforce Crisis

A Scoping Paper prepared by
Michael Legg & Associates

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Michael Legg & Associates

Consultants in Information and Organisational Systems

12 Dianella Street, Caringbah NSW 2229, Australia - ABN 34 706 197 112
Phone: +61 2 9531 0612 Fax: +61 2 9501 3853 Mobile: +61 4 1125 6312 Skype: michael_legg
Email: michael_legg@optusnet.com.au

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1 EXECUTIVE SUMMARY

That there are workforce shortages in pathology is not a new finding¹. This is a healthcare system-wide problem.

What has not been well recognised to date is the current impact of these shortages and the extent to which many of the mitigation strategies designed to improve productivity for the broader healthcare system have already been widely deployed in the pathology sector. Further application of such strategies is therefore not likely to have the same impact for the pathology sector as they might elsewhere.

Indeed, it was argued during consultation discussions that this past success in productivity improvement over the last two decades was a likely cause of the late recognition of the extent of the current problem.

This report shows that it is clear that there is now a real problem with workforce shortages in pathology and the available projections infer a further and significant impact on service quality and timeliness if urgent action is not taken².

Because of the critical role that pathology plays in so many aspects of clinical decision making, impacts on pathology service quality and timeliness will have serious consequences for safety and efficiency in the whole health system.

All those consulted agree that there are workforce shortages in all parts of the pathology workforce. The critical shortages are best documented for specialist pathologists but there is also good evidence of a critical shortage of scientists. All agree however that too little is known about the workforce to manage it properly, both as a whole or in its component parts.

While the pathology workforce needs to be considered as part of any broader health workforce review, it cannot wait for any 'comprehensive industry-wide' solution which, in any event, may be less appropriate to its needs. Those working in pathology believe that co-ordination at a national level is required.

Mitigating strategies are proposed here that need to be considered and acted upon as they apply to the various workforce groups but there is an urgency for this action to occur which will in the first instance by necessity need to be aimed at maintenance. It was argued that the window of opportunity for this is as short as eighteen months.

The strategies outlined in this report are presented under the following framework, according to their focus and intent. However, the headings included in the framework are not mutually exclusive and it is expected that multiple, related strategies will need to be adopted.

¹ There have been reports on health workforce issues by the Productivity Commission on behalf of the Council of Australian Governments, by the National Health Workforce Taskforce (and before them the Australian Medical Workforce Advisory Committee) on behalf of the Australian Health Ministers Advisory Committee, by State Governments and from Colleges and Scientific Societies. More than 15 such reports and submissions specific to pathology and its sub-disciplines are listed in Appendix B.

² A National Workshop on Quality and Safety in Pathology with around 50 participants held in November 2007 identified workforce as a current critical problem and the greatest risk to quality and safety facing the pathology sector.

The framework is as follows:

- Increase the supply of workers by
 - Increasing the opportunities for education and training
 - Improving recruitment
 - Retaining the workforce longer
 - Attracting re-entry of those who have exited
- Redistribute the workforce from areas of lower to higher demand
 - Geographically
 - By discipline
- Improve the productivity of the workforce by
 - Improving work design
 - The introduction of new technology
 - Further consolidation
- Reduce the demand by
 - Improving the quality of ordering
 - Rationing

The approach adopted will necessarily be different for different types of worker and for different places.

2 BACKGROUND

2.1 Scope of this report

Michael Legg and Associates was asked to ‘assist the Department to prepare a background discussion paper which sets out the scope and structure of the pathology industry workforce and draws together a summary of the key issues, gaps and opportunities for further work to be undertaken on this issue’.

A series of consultations were undertaken including meetings in four states/territories. The details of these are provided at *Appendix A – Consultations undertaken*.

Relevant reports and submissions were identified and reviewed and submissions were invited from relevant organisations. These are shown at *Appendix B – Reports, papers and submissions*.

2.2 Pathology

Pathology is a medical specialty which focuses on understanding what causes disease and in making diagnoses.

Pathology involves the examination and testing of body fluids (eg blood), body tissues and cells to identify what changes are occurring and to assist in selecting the best course of treatment. It is the diagnostic skills of pathologists and their laboratory-based scientific colleagues that allow patients to know if they are pregnant, anaemic, diabetic, at risk of heart disease or if their lump is cancerous.

Pathology plays a critical role in more than 70% of clinical diagnoses and many of the decisions around the optimal treatment for patients.

Pathology is a scientific discipline and research has always been a cornerstone. Many of the great advances in medicine such as antibiotics, vaccines, transfusions and transplants have been based on the work of pathologists. Several internationally recognised Australian scientists, including two Nobel Prize winners, have done their prize-winning work in pathology-related research fields, such as immunology. Pathology is now working directly at the rapidly advancing frontiers of genetics, including molecular biology, epigenetics and pre-emptive and personalised medicine.

2.3 The current pathology work environment

Whether owned by governments, non-profit organisations or shareholders, the pathology organisations and their laboratories in Australia are now quite similar in their structure and function.

Three private national pathology organisations do around 80% of the community pathology in Australia and there is either just one or a few publicly-funded pathology networks in each State, which mostly service the public hospitals. The actual volume split between public and private pathology is not known but has been estimated at 60% private and 40% public.

While there are differences in emphasis in their caseload, with public pathology doing more hospital work and private pathology more community work, there are public laboratories that provide community services (to private practice GPs and specialists) just as there are private

pathology practices that do complex hospital-based and specialist work (in some cases for public teaching hospitals).

No laboratory in Australia can do all of the tests asked of it and there is a well established (although said to be under-remunerated) mechanism for referral both between laboratories and across sectors.

Whether privately or publicly owned, most pathology services are provided in large centralised laboratories in capital cities. These laboratories are associated with a network of smaller regional laboratories, often located within hospitals – both public and private.

In addition, there are also more than a hundred boutique (mostly private) and niche research laboratories (mostly public) and a small but growing amount of pathology testing is done at the “Point of Care” rather than in laboratories. In hospitals, for example, this point-of-care testing may be in the form of troponin level testing in the Emergency Department to check for indications of myocardial infarction (heart attack), the use in General Practice of INR testing for the management of anti-coagulant therapy, and for use by consumers/patients to check their blood glucose levels for diabetes.

Hospital-based and comprehensive private laboratories are almost always 24 hour operations. For those working in the community sector, most activity occurs in the evening.

Associated with the laboratory is generally a wide network of facilities for the collection of pathology specimens. This includes a sophisticated, quality-assured logistics network for the safe transport of specimens between healthcare facilities (including general practice), collection centres, and laboratories.

Larger pathology laboratories are broken up into departments that reflect the knowledge domains and sometimes the nature of the testing that is done. These include:

- **Histopathology:** examining organs, tissue and cells to decide if a disease is present and what effect it could have on the patient eg whether a breast lump is cancerous or not.
- **Cytopathology:** the examination of small samples of cells to identify abnormalities, usually from a smear (eg a pap smear for cervical cancer), brushing technique (to collect skin cells) or fine needle aspiration (from a cyst).
- **Microbiology:** the study of bacteria, fungi, parasites and viruses to examine, diagnose, treat and prevent the spread of infection. Outbreaks of food poisoning, meningitis or a virulent strain of flu would be investigated by a microbiology or virology laboratory.
- **Haematology:** the study of blood cells in order to identify any abnormalities. Haematologists diagnose and treat a variety of blood disorders including anaemia, haemophilia and blood cancers, including leukaemia.
- **Immunopathology:** focuses on disorders of the immune system and the body’s ability to resist invasion by foreign organisms. Immunologists play a key role in transplants and diseases like HIV-AIDS.
- **Blood Banking (Transfusion Medicine):** combines haematology and immunology disciplines for testing compatibility and quality of donated blood.
- **Chemical Pathology:** the study of body fluids such as blood, urine, saliva or spinal fluid to detect abnormalities and make a diagnosis eg diabetes, high cholesterol and nutritional disorders.

- **Toxicology:** the study of the effect of different substances on people, animals and the environment. Toxicologists can diagnose poisoning and help devise a treatment. They assess side effects of new medicines and determine safe doses.
- **Genetics and Cytogenetics:** the examination of chromosomal and genetic abnormalities. This covers a range of issues such as prenatal diagnosis (eg Down's syndrome), predictive testing for cancers and reactions to certain drugs.

Clinical Pathology is a generic term that refers to chemical pathology, haematology, microbiology, blood banking and genetics/cytogenetics. **Anatomical Pathology** is a term used to group histopathology, cytopathology and post mortem investigation.

Many large laboratories now have a separate area for high-volume, rapid-turnaround testing which provides tests from the chemical pathology, microbiology and haematology disciplines.

Smaller laboratories tend to do a limited range of tests that require rapid turn-around or special expertise.

2.4 The current pathology workforce

There is an often-held, but largely misguided, perception that pathology testing is all done by machines and that there is not much human involvement. The average pathology service episode actually involves around one hour of worked time from a complex workforce team using a diverse range of skills.

2.4.1 Types of pathology worker

The pathology workforce consists of the following types of 'worker':

- **Specialist pathologists** – are medical graduates with an additional five years specialist study and training to become expert in the use of laboratory tests to diagnose and treat disease. In Australia, pathologists choose to train in one or more of the following disciplines: general, anatomical, chemical, clinical, forensic, genetics, haematology, immunopathology or microbiology. There has been an increasing trend to even greater sub-specialisation, with general and clinical pathology not being popular options. Some, such as chemical pathologists, haematologists, immunopathologists and microbiologists, also work directly with patients and hold joint Fellowships with the Royal Australasian College of Physicians. All pathologists have the role of interpreting the laboratory findings in clinical context. General pathologists are trained in all the disciplines and clinical pathologists in the clinical disciplines.
- **Medical scientists** – are generally graduates with specific training in medical laboratory science and experience in testing in at least one of the disciplines of pathology. Senior scientists often have additional post-graduate qualifications from universities and/or their scientific societies. There are areas of pathology where scientists take a stronger leadership role than others – these are generally in the clinical (as opposed to anatomical) disciplines and the scientist can be the most expert in the team, especially in emerging areas such as genetics. Senior scientists provide much of the supervision and quality management in laboratories and are often recruited into laboratory management positions.
- **Health informaticians** – ideally should be graduates specifically trained in health informatics – a discipline dealing with the collection, storage, retrieval, communication and optimal use of health related information and knowledge. In practice, however, few

have come via this route and most are either graduates in computer science or medical scientists that have learned on the job³. Health informaticians are responsible for the safety, quality and development of the pathology information system and associated communications.

- **Technical officers or medical technicians** – are workers with two years' post-high school training to the Certificate IV or Associate Diploma levels. Although they work under the direction of a Medical Scientist, they are able to do most routine work in the laboratory.
- **Laboratory assistants** – generally have no relevant post-school training other than that provided in the work place. They perform many of the non-analytical tasks within the laboratory that involve specimen handling including reception, preparation and transport within the laboratory. They may load analysers but do not release results.
- **Collectors & nurses** – collectors are mostly trained by pathology practices but many of these training programs are formal and accredited. Some nurses also act as collectors but most are provided with the same training as for other collectors. Some specific types of collections require that they be done by or with a registered nurse, such as autologous blood collection. Collectors take specimens which may be body fluids, scrapings or smears but mostly they collect venous blood.
- **Pathology couriers** – are also workplace-trained and have a higher level of training and responsibility than do general carriers. They transport specimens to the laboratory and reports (and other materials such as collection supplies) to healthcare facilities. They are an important link in the chain of information custody and are responsible for biosecurity and the safe delivery of (often irreplaceable) specimens needed to make life and death decisions.
- **Clerical staff and others directly involved in testing** – a category of worker that includes those with data entry and clerical training and for some, such as the medical typists, quite specific medical terminology training. These workers are involved in areas such as specimen reception and request and result entry.
- **Management & support services** – includes general and operations managers, accounts staff, human resources, engineers, stores and liaison staff.

The National Pathology Accreditation Advisory Council (NPAAC) document “Requirements for the Supervision of Pathology Laboratories”⁴ includes definitions for a pathologist, a senior scientist and a scientist and describes expectations around staffing and requirements for the supervision of laboratories.

³ There has been a push to introduce informatics as a pathology discipline in its own right (like haematology) but although this has progressed in the US and is starting in the UK it has not yet been adopted in Australia

⁴ NPAAC Supervision Document 2007

Only pathologists currently have a registration scheme, in the form of the State/Territory medical registration schemes. Despite the fact that medical scientists are registered in other Western countries and the Australian Institute of Medical Scientists has called for their registration, the current COAG review of the registration of health professionals has not identified this as an area for attention. This may in part be due to a lack of awareness of the extent of responsibility held for the production of high quality patient test results by scientific officers in partnership with specialist pathologists.

2.4.2 Census, benchmarking, satisfaction and planning

The 2006 Census⁵ revealed the following self-reported data for pathology-relevant occupations.

	Males	Females	Persons
234611 Medical Laboratory Scientist	4,340	9,029	13,369
311213 Medical Laboratory Technician	2,107	9,569	11,676
253915 Pathologist	584	571	1,155
253313 Clinical Haematologist	39	30	69
Sub Total Pathology	7,070	19,199	26,269
Total Health Workforce	136,676	456,172	592,848
Proportion which is pathology	5%	4%	4%

A typical laboratory might have the following profile of full time equivalents for the categories described in the section above.

Pathologists	3%
Medical Scientists	21%
Technicians	4%
Lab Assistants	12%
Collectors	33%
Couriers	7%
Clerical	17%
Support	3%
Total	100%

Around half of the staff in a comprehensive practice which includes regional laboratories work within the 'biological testing zone'. The rest are involved in the collection and transport of specimens and support of the organisation.

A measure used by David Maister⁶ to gauge the efficiency of professional organisations is the ratio of professionals to others – so-called “leveraging”. If pathologists alone are considered to be the professionals in this category then the “leverage” is 1:30. If you include senior scientists it might drop to 1:10 but it is still very high by comparison to other health disciplines and other professions.

A comparison of the ratios of pathologist category to others in the two data sets here suggests that there may be people other than pathology-related personnel ticking the Medical Laboratory Scientists and Medical Laboratory Technician box on the Census paper; or alternatively that people still consider themselves to be of that occupation even though they are not currently working in pathology. Any survey undertaken would need to clearly differentiate between those involved in research and those in service roles.

On the evidence it would be reasonable to state the number of persons working in the pathology sector is between 30,000 and 50,000. This is more than 5% of the total health workforce. At least 70% of the pathology workforce is female.

⁵ ABS 2006 Census by health occupation Feb 2008

⁶ A noted management consultant in professional organisations <http://davidmaister.com/>

Work satisfaction and environment surveys have been undertaken both for scientists⁷ and pathologists⁸. Reference is made to relevant results from those surveys in the sections that follow.

The pathology workforce is not tracked by the Australian Institute of Health and Welfare as for other areas of healthcare in their biennial reports on Australia's health⁹ but its future inclusion would improve monitoring options.

There was some work on modelling the specialist pathologist workforce in 2002-03 by the Australian Medical Workforce Advisory Committee¹⁰.

A survey was undertaken in 2007-08 by NPAAC¹¹ of senior scientists and pathologists. This work was undertaken for the purpose of establishing the availability of laboratory supervision capacity and because there were no other reliable sources of data available for that information. These survey results confirmed that there is a problem and provided some insights to its urgency. Despite having only a 60% response rate, the results were checked by the relevant professional associations who considered that the data was likely to be a reasonable representation of the current situation. This data is, however by its nature, a useful but incomplete snap shot and those consulted agreed that a more comprehensive and regularly updated set of data is required in order to manage the pathology workforce effectively on an ongoing basis.

⁷ Charles Sturt Uni The professional status of medical scientists in Australia 2003 McGregor & Moriarty

⁸ RCPA Work Environment Survey August 2007

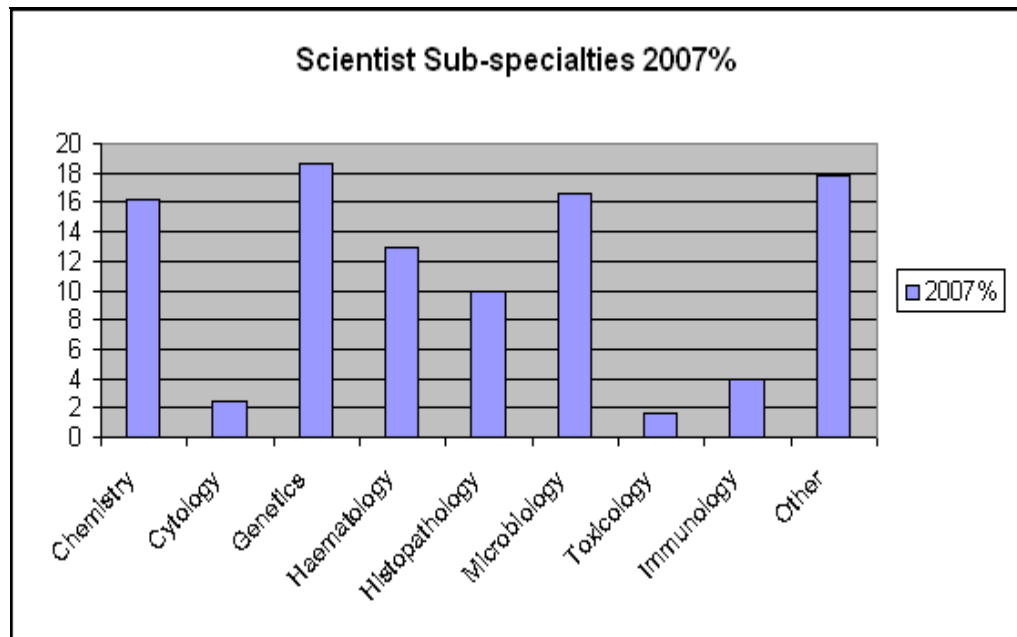
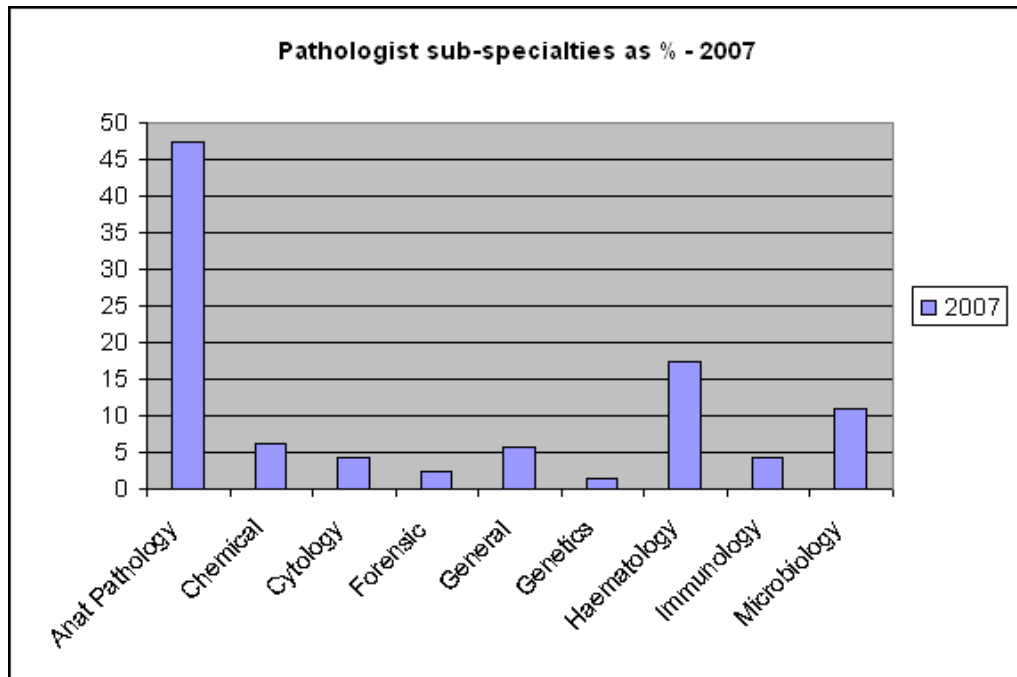
⁹ AIHW Australia's Health 2008, Chapter 8.2 Workforce

¹⁰ AMWAC The Specialist Pathology Workforce in Australia - Supply and Requirements 2003-2013 - 2003

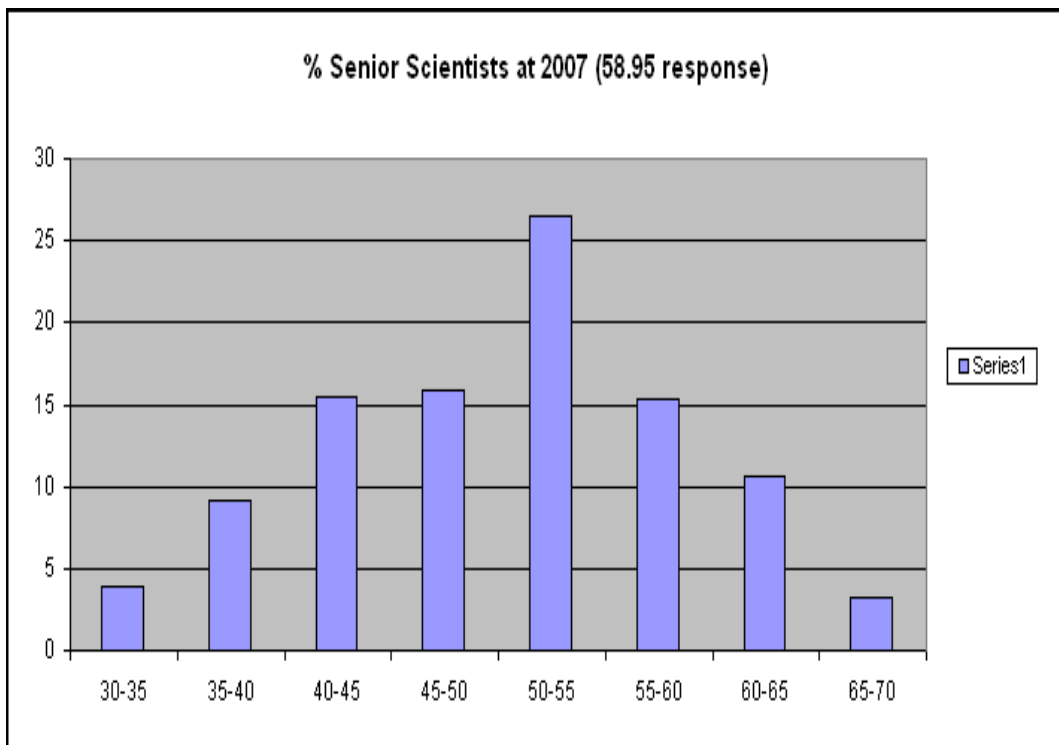
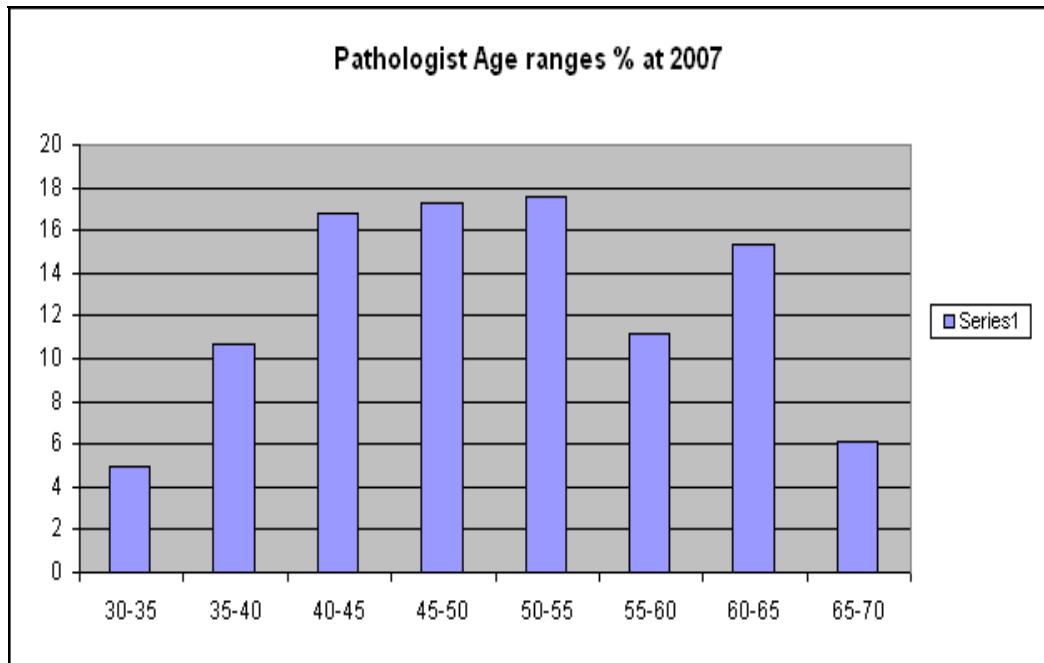
¹¹ NPAAC Pathology Workforce Census 2007 (with around a 60% response rate)

¹² Pathologists July 2008

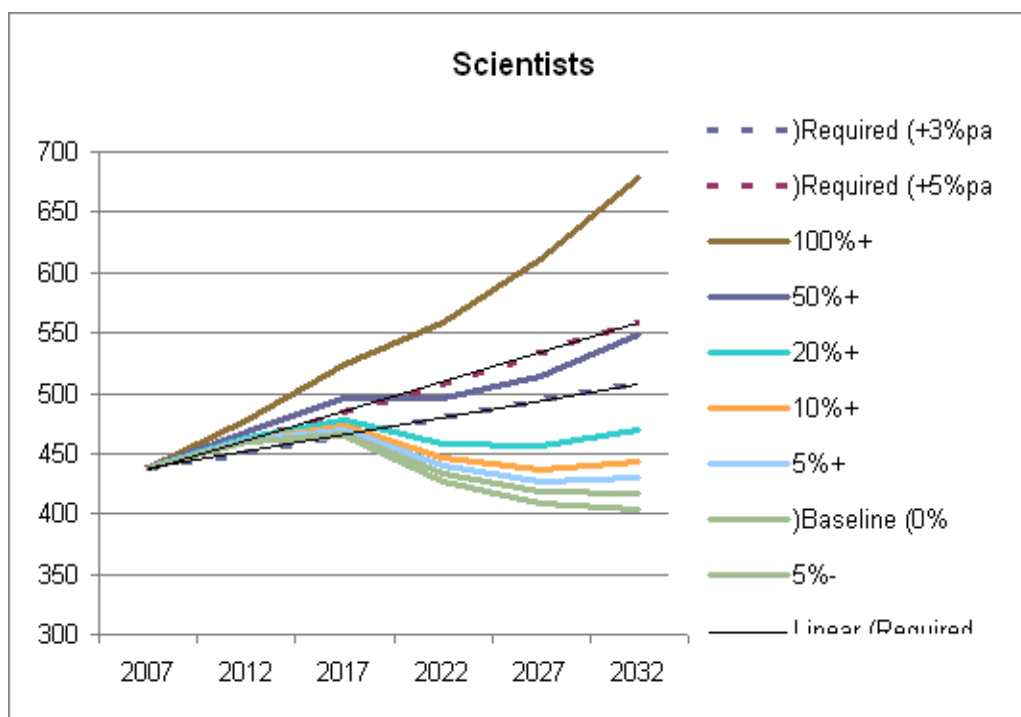
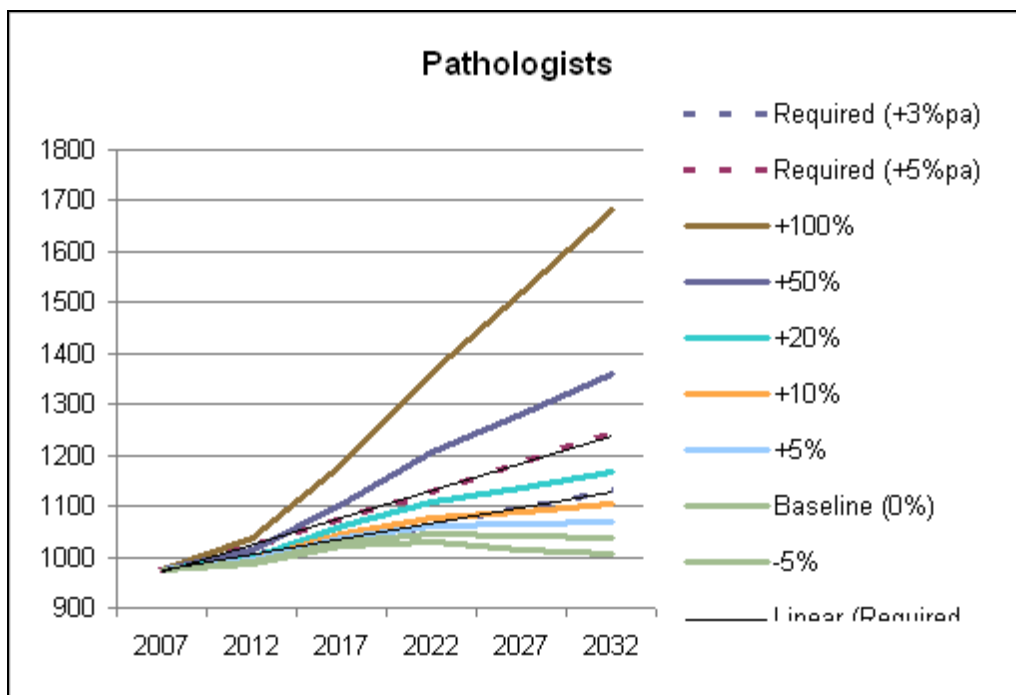
Data on the breakdown by discipline for pathologists and senior scientists from the NPAAC survey is shown graphically below (% workforce by discipline):



Data on the age of pathologists and senior scientists from the NPAAC survey is shown graphically below (% workforce by age range in years):



A model was established by the NPAAC working group to test workforce projections for pathologists and senior scientists. The results of that model are shown graphically below. The number of workers is plotted against years from 2007 to 2032 by five year steps. Baseline is what would happen if there was no change to today's processes. The lines marked as +x% show the growth in numbers if there could be an x% recurrent growth in net entry. The dotted lines show required numbers assuming the present workforce levels are adequate and a 3% and 5% recurrent growth in pathology demand.



2.5 The current education and training environment

A brief overview of the current education and training arrangements for the sector is provided below.

2.5.1 Colleges, Societies and Associations

In addition to education institutions, at least 16 other organisations have a role of representing and educating members of the pathology workforce. They include:

- Specialist Colleges
 - Royal College of Pathologists of Australasia (RCPA)
 - Royal Australasian College of Physicians (for dually qualified Fellows)
- Scientific Societies and Associations
 - Australasian Association of Clinical Biochemists (AACB)
 - Australian Institute of Medical Scientists (AIMS)
 - Australian Society of Cytology (ASC)
 - Australian Society for Microbiology (ASM)
 - Australian New Zealand Society of Blood Transfusion (ANZSBT)
 - Australasian Society of Clinical Immunology and Allergy (ASCIA)
 - Haematology Society of Australia and New Zealand (HSANZ)
 - Health Informatics Society of Australia (HISA)
 - Human Genetics Society of Australia (HGSA)
 - International Academy of Pathology, Australasian Division (IAP)
 - Public Health Association (PHA)
- Industry Associations
 - Australian Association of Pathology Practices (AAPP) - Non-government, private sector pathology practice members
 - National Coalition of Public Pathology (NCOPP) – Government-owned pathology practice members
 - Pathology Associations Committee – a forum made up of most of the above groups, with the secretariat function undertaken by the RCPA
 - Australian Hospital and Healthcare Association (AHHA) – Public hospitals

2.5.2 Education Institutions

Education programmes relevant to the pathology workforce are offered by Universities, Institutes of Technology, TAFE Colleges, through accredited education courses conducted by pathology organisations and through on-the-job training.

An overview of these programmes is provided by work category in the following sections.

Pathologists

In line with the model which occurs in most other medical specialty fields, the RCPA and its Fellows support the training of medical graduates toward a Fellowship in pathology. Those trainees mostly derive from the 18 medical schools in Australia. Of these, most now run graduate entry programs. The output from medical schools is expected to almost double from 2010.

As noted above, in Australia pathologists choose to train in one or more disciplines over a five year post-graduate training period. With increasing complexity in scientific knowledge, there is a trend to even greater sub-specialisation, and general and clinical pathology have become less popular options.

The training program involves both academic learning, including Part I and II examinations, and on-the-job training and adequate specialist supervision is a critical element in this training process.

The RCPA is involved in credentialing overseas trained pathologists and has actively refined its assessment processes so as to facilitate entry to the Australian workforce where appropriate.

The RCPA expects around 70 to sit their Part II examinations in 2008 and then, providing that training time is completed and the exams passed, they will graduate pathologists in the mix shown in the table below.

Discipline	Number Sitting Part II Exam 2008
Chemical Pathology	4
Microbiology	14
Immunopathology	7
Forensic Pathology	2
Haematology	23
Genetics	1
Anatomical Pathology	30

Medical Scientists

The Australian Institute of Medical Scientists (AIMS) has the role of accrediting bachelor degree programs in medical laboratory science in Australia. These are at James Cook University and QUT in Queensland, University of Technology, Sydney and Charles Sturt University in New South Wales, RMIT University in Victoria, University of Tasmania, University of South Australia and Curtin University of Technology in Western Australia.

An example of undergraduate, postgraduate and research pathways is provided by RMIT University¹²

Fellowships and other post-graduate qualifications in specific areas of laboratory medicine are offered to scientists by the AACB, AIMS, ASC, ASM and HGSA. RCPA currently offers Associate membership for senior scientists and is examining the possibility of providing a full Fellowship option in the near future.

Between 220 and 240 students are expected to graduate from AIMS accredited courses in 2008. Of these, between 80% and 95% can be expected to enter the medical science workforce; some of the remainder will go on to other studies, many into medicine.

AIMS is also the assessing authority for overseas-trained laboratory scientists under the General Skilled Migration program.

¹² RMIT Laboratory Medicine pathways 2008

Technical Officers and Medical Technicians

This is the group for which there is greatest variation in the training that is being offered and indeed what the job is called and what is expected of the worker.

In most cases it requires two years' post high school training to the Certificate IV or Associate Diploma levels which is provided by TAFE Colleges or Institutes of Technology.

There is an issue with high variability in the quality of TAFE offerings for technicians.

Laboratory Assistants

Laboratory assistants require no relevant post-school training other than that provided in the work place.

Health Informaticians

Courses have been available at the undergraduate and graduate levels but a number of the courses have closed in recent times and none have been specific to pathology. Sydney University and LaTrobe University continue to offer programs. On-line education is being developed internationally and the Health Informatics Society of Australia is establishing a voluntary registration system for this group of professionals.

The Australian Computer Society accredits health informatics courses in Australia because of their historical association with information technology departments.

Collectors & Nurses

Collectors are mostly trained by pathology practices but many of these training programs are formal and accredited. Some nurses also act as collectors but they are generally still provided the same training as for other collectors.

Others

The rest are not specific to pathology and have a myriad of options for formal and on the job training.

2.6 A comparison with the broader health workforce

That the needs of the pathology sector are not currently being recognised in the larger health workforce review activities is an issue identified in consultation.

There is speculation that this is because the pathology workforce is small by comparison (at around 5%) and that there has not yet been a trigger to focus that attention, like media-attracting incidents related to quality or service levels, as there has been in other parts of the acute care sector. This, however, has started to occur, for example, in Canada where the pathology workforce shortages have reached a critical point.

The Productivity Commission, in their report¹³ on Australia's health workforce, identified the following systemic problems:

2.6.1 Productivity Commission Report

- Fragmented roles and responsibilities, with health workforce policy 'compartmentalised' by profession, even in circumstances when an integrated 'cross-profession' approach is clearly called for

¹³ COAG Productivity Commission 2005, Australia's Health Workforce, Final report, Canberra

- Inadequate co-ordination mechanisms, inflexible and inconsistent regulation with a lack of collaborative policy efforts to improve co-ordination across the various parts of the system
- Inflexible and inconsistent regulation that is subject to considerable influence from the professional groups concerned, and widely perceived as inhibiting changes to scopes of practice and the development of new competencies that could help to better meet changing health care needs
- Perverse funding and payments incentives that may result in patients seeking treatment from a doctor, when (unsubsidised) treatment from another health professional may be more appropriate and limited incentives for medical practitioners to delegate less complex service provision to other suitable skilled but more cost-effective, health professionals;
- Entrenched workforce behaviours that are heavily influenced by 'custom and practice'

As will be seen from what follows, these themes and the associated mitigation strategies are probably more applicable to other parts of the health care system than to the pathology sector. This is largely because the pathology sector has undergone a process of structural review over the past twenty years or more, and many of the strategies outlined in the response by COAG (shown below) are already under consideration and/or in place. This is not to say that there is not more that could be done and consultation undertaken to date has revealed a strong stated desire on the part of the sector to engage with governments to make further progress.

2.6.2 COAG Response to the Productivity Commission Report

- Reduce health workforce shortages through significant investments, including additional medical school and higher education nursing places and capital funding for medical schools and nurses' clinical training. The increase in medical school places would result in an expansion in the number of medical school places bonded to areas of workforce shortage
- Promote workforce mobility and consistency between jurisdictions by creating national registration and accreditation schemes for health professions
- Provide greater health service access for rural, remote and indigenous communities by introducing a new Medicare item for practice nurses and registered Aboriginal health workers to provide ongoing support for patients with chronic disease
- Help medical specialist trainees build appropriate skills and experience by providing a new system of training rotations through an expanded range of settings beyond traditional public teaching hospitals, including regional, rural and ambulatory settings, private sector hospitals and practices and community settings
- Create a national health workforce taskforce to undertake workforce projects and advise governments on workforce innovations and reforms.

Additional relevant and targeted policy options to address outstanding areas for attention in relation to the pathology workforce are provided for consideration in the last section of this report.

2.7 The regulatory environment in pathology

Pathology has led the way amongst medical domains in that it has a formal and compulsory inspection and accreditation process with standards that are highly codified.

Standards for pathology laboratory organisational systems are developed and published by the National Pathology Accreditation Advisory Council (NPAAC), in a unique arrangement which includes Commonwealth and State/Territory governments, medical and scientific professional groups, relevant industry representatives, and consumers. NATA (The National Association of Testing Authorities) and the RCPA Quality Assurance Program together provide an assessment service that audits laboratories against the NPAAC standards. A combination of NATA and RCPA QAP assessments lead to the accreditation of laboratories in specific areas of operation if the relevant standards have been assessed as met.

The NPAAC standards identify requirements for performance against technical standards. These technical standards cover methods including clear linkage to reference methods (often established by the scientific societies), units and the requirements for external proficiency testing (Quality Assurance).

NPAAC standards also, however, embrace by reference such things as building codes and safety standards, including infection control, ergonomics, lighting, biological waste and environmental emissions such as radiation.

The NATA/RCPA assessment also looks at the pathology laboratory's own internal procedures and work instructions.

This accreditation status, combined with formal undertakings from the laboratory owners and the pathologists, is required before Medicare benefits can be paid for services in the Medicare Pathology Services Table. The Medicare Services Advisory Committee (MSAC) makes recommendations to the Minister for new services to be added to the Schedule only on the basis of established safety, effectiveness and cost effectiveness.

There are also NPAAC standards defining the training and competence required for technical and medical personnel for the purposes of ensuring adequate professional supervision of testing. The RCPA arranges training and examine medical practitioners in the specialty of pathology. The RCPA is assessed for its training competence by the Australian Medical Council. Universities, TAFE, and various scientific societies provide training and examination for scientific and technical staff according to the criteria of the Australian National Training Authority.

Some laboratories also voluntarily subject themselves to further auditing against other international standards for example ISO 9000 – Quality Systems and/or the Business Excellence Framework.

Pathology laboratories that service hospitals and other healthcare institutions are also required to demonstrate service levels in accordance with the institution's accreditation systems, such as ACHS's EQUIP program.

The adoption of international standards (ISO) has changed the focus from seeing laboratories as systems (ISO Guide 25, ISO 17025) to identifying that staff have key roles in the production of quality results (ISO 15189). This change is apparent in the requirements of ISO 15189 which require laboratories to have regular, documented competence testing of staff, to provide continuing education and for staff to have appropriate continuing professional development programs.

The pathology professions and industry have also participated in a model of joint governance with successive Australian governments since the early 1990s. These discussions have occurred largely in the context of the Pathology Consultative Committee (PCC), a peak advisory group comprised of the Australian Government, the Royal College of Pathologists in Australasia, the Australian Association of Pathology Practices and the National Coalition of Public Pathology. Much or most national pathology policy developed during this period, especially that related to Medicare expenditure, has been significantly influenced by consensus reached through this group. The PCC, in conjunction with its sub-committee the Quality Use of Pathology Committee, also oversees the Quality Use of Pathology Program, the aim of which is to identify, explore and evaluate opportunities to improve the practice, use and benefit of pathology testing.

2.8 A comparison with peer countries

The quality of pathology services provided in Australia has a good reputation, both nationally and internationally, and is generally considered to be world class. It may be of interest to note, for example, that the next international meeting of pathology colleges will be held in Sydney in early 2009.

The issues relating to workforce identified in this paper have also been experienced by other countries that are commonly used for comparison such as New Zealand, the US and Canada. Taking Canada as the example – there has been headline news because of what appears to be a major failure in quality, with workforce shortage being identified as a major contributing factor.

Australia, because of its comprehensive quality and accreditation system, has been somewhat protected from the kinds of incidents happening now in Canada. Many countries have observed and drawn on the system for laboratory accreditation that was established co-operatively here in Australia

The UK has recently initiated a total review of their health workforce and how structures within the NHS would work better. This has included definitions of competencies and the development of borderless training frameworks, with dedicated, centralised funding (to the tune of £4 billion) for training in the medical science-related fields so that training positions can be supported where there is an identified need and the capacity to support them.

The operating model used by the largest Australian private pathology practice has also been proved internationally, with successful operations now in place in the UK, Germany, New Zealand and the US.

3 DRIVERS

3.1 Demographic change

The strongest of the drivers leading to workforce shortage is demography and in particular the impact of the “baby boomer” birth-rate bulge reaching retirement age. When this is combined with increased life expectancy, there is a double impact for healthcare – a reducing supply of workers with an increasing demand for services.

Pathology as a component of the healthcare sector faces these general trends. Succinctly put:

- Healthcare workforce supply is going down¹⁴ because
 - workforce entry is going down because
 - there is a reduced birth rate which is below replacement
 - generation Y (now 16-31 years old) are uncommitted to the same construct of career as previous generations and will inherit baby boomer wealth
 - there is a reduction in the understanding and prestige of science
 - there is competition for workers especially from boom sectors outside health
 - workforce exit is going up because
 - the workforce is ageing and large numbers are due for retirement in the near future
 - there is a feminisation of the workforce with more time taken out for a range of reasons (often family-related)
 - there is an increasing reduction in commitment to full-time work (and particularly long hours of work) by both men and women
 - there is competition for workers
 - BUT the workforce is also maldistributed because
 - professionals want to live in the affluent parts of cities
 - healthcare training has been done in the cities and trainees remain there
 - specialists are well settled and committed by the time they qualify at around 41 years of age
- healthcare demand is up because
 - people are living longer¹⁵ leading to
 - more disease prevalence
 - proportionately more complex diseases like cancers and dementia
 - more co-morbidities
 - more can be done in health care
 - with advances in diagnostic and therapeutic technologies such as better prostheses and surgical interventions
 - an explosion in the understanding of molecular pathology and the potential for personalised medicine
 - consumer expectations have increased
 - healthcare rationing is not considered acceptable – “no expense will be spared on the care of my loved ones”
 - service expectation is higher on the part of “baby boomers”
 - BUT the capacity of government to pay is going to reduce because
 - there are fewer workers to pay tax and drive gross domestic product.

¹⁴ It was reported that the workforce 15-64 years will halve in 10 years

¹⁵ It was reported that those over 65 will double in 10 years

Data for the pathology sector and qualitative evidence from the consultations for this paper suggest that these trends are happening sooner for pathology and that they are more severe because they are being compounded by other more specific sector issues. These issues are considered in more detail in **Section 4 - Problems**.

3.2 Technology and medical advances

Technology has had a marked impact on the pathology sector¹⁶ and consequently on its workforce. The future promises even more likelihood of change although this change is more likely to occur in relation to doing new things rather than doing existing things faster, which has been a feature of progress in the last three decades. Considerations include:

- Automation within the laboratory and the use of electronic decision support has changed the processes within the pathology laboratory, the roles of workers and the quality of analysis.
- The development of instruments capable of being used at the point of care which, while there are some issues around cost and quality now, are being progressively adopted and may change where high volume and/or time-critical testing is done and by whom in the future.
- Digital microscopy has now progressed to a stage where histological slides can be scanned at up to 50 levels of depth automatically, allowing a computer screen to be used for microscopy. While currently still expensive and slow, this will improve and means that the 'reading' of slides can be done anywhere, allowing for distribution of the workforce, workload balancing and/or for special expertise to be drawn on where necessary. The next advance, which is in the research phase now, is the introduction of image-based decision support. It is likely to be ten years, however, before these technologies are ready to improve the productivity of anatomical pathologists to any extent.
- The burgeoning understanding of biology and the rapid development of molecular biology and epigenetics, allowing for pre-emptive and personalised medicine. For example, from a limited base there has been an explosion in the knowledge around common diseases in the last two years and much of this testing will form part of mainstream practice within five years.
- The capacity to trap and identify blood-born cells from solid tumours such as breast and colon has been demonstrated in research. The commercialisation of this technology may well have a significant impact on the use of histopathology
- Other medical advances, such as the introduction of the cervical cancer vaccine (Gardasil) in 2007 to all 12 year old girls nationwide as part of the school immunisation programme, may well reduce or at least alter demand for Pap tests in the next 10 years. New technologies such as automated screening (using liquid based cytology samples and an imager) promise better performance. The ThinPrep imaging system is before MSAC now and a result is expected in November 2008.

3.3 Efficiency

Whether driven by necessity because of cost pressure with rising volume or because of competition, there has been a marked and continuous increase in efficiency in the pathology sector for the whole of the last three decades of technological advancement. This has not just

¹⁶ for all of its history but especially the last three decades

been because of automation – there has also been significant consolidation, work substitution and process engineering undertaken as part of a significant program of structural reform in the industry.

Historically there has been an average increase in volume of testing of around 8% per annum without a matching rise in funding. This, the industry reports, has resulted in a twenty five year “efficiency” dividend.

There is a perception that there has been a long and continuous drive for efficiency in the pathology sector, which has not been matched in other areas of medicine in Australia. The effect of this restraint has been exacerbated by the introduction of new tests into common clinical practice before the sometimes lengthy process of funding has been determined.

3.4 Demand

The demand for pathology is expected to rise and is being driven by matters including:

- Increased disease prevalence and complexity with ageing population
- Increased cancer prevalence with increased longevity
- Increased emphasis on evidence based medicine that requires pathology for decision making
- Increased use of pathology testing for eligibility for subsidised drug therapy and monitoring
- Increased genetics (epigenetic and molecular pathology) testing for pre-emptive and personalised medicine
- Increased consumer expectation that testing is part of diagnosis and treatment.

3.5 Partisan mutual adjustment

The consultations also revealed a widely held perception that pathology had declined in its prestige and capacity to win funding against other medical disciplines where “partisan mutual adjustment” is the norm in the resource-limited environment of healthcare.

Reasons offered for this include:

- The limited actual contact between pathologists and their patients
- A reduction in clinical emphasis on the science of medicine, including significant reduction in pathology content in medical training, with a consequent underestimation of the value of the contribution made by pathology testing
- The erroneous perception by the users of pathology and their patients that pathology is a machine-based discipline with little human involvement or expertise required
- Lack of promotion of the value of pathology by the pathology profession themselves
- Competition within the industry and the high service levels offered by pathology practices to requesters and consumers
- The “commoditisation” of pathology, particularly in the hospital environment, where it has been sometimes grouped and dealt with in the same way as support services such as laundry and catering.

4 PROBLEMS

4.1 All agree there is an immediate problem!

No-one spoken to in the consultations believes that there is not an immediate problem with workforce shortage in pathology, nor did anyone suggest that it will not be a much bigger problem if action is not taken soon.

All those consulted agree that there are workforce shortages in all parts of the pathology workforce. The critical shortages are best documented for specialist pathologists but there is also good evidence of a critical shortage of scientists.

All also agree that too little is known about the workforce as a whole, or in its component parts, to manage it properly.

4.1.1 Medical Scientists

AIMS writes: “It is generally accepted that there is a significant shortage of medical scientists in Australia, and that this shortage is particularly acute in rural and remote areas and is exacerbated by the ageing of the medical science workforce”. A recent estimate indicated that more than 50% of Senior Scientists (using the National Pathology Accreditation Advisory Council definition) are aged 50 or over.

The exact extent and severity of the shortage of medical scientist is not known: in fact, we do not know how many medical scientists are employed in Australian laboratories nor do we know how many unfilled vacancies exist. A detailed survey to determine the numbers, sex, ages, geographical distribution, educational levels, employment levels and other essential information must be a priority, and should be undertaken at the earliest opportunity Without these data any study of the pathology workforce will be severely limited” (AIMS, 2008).

4.1.2 Pathologists

The RCPA reports that “over the last 10 years in Australia, at least 70 training positions have been cut out of the system by stressed health administrators trying to balance budgets for the short term. There was seen to be no imperative to plan for the longer term. There are currently 1,290 pathologists in active practice in Australia and 20% of these are over the age of 60. 130 are over the age of 65. Currently in Australia, only approximately 70 new pathologists are produced each year on the funding made available by governments. This is quite frightening considering the age profile of pathologists and the fact that there are more than 70 vacancies in the system for qualified pathologists that cannot be filled.”

Further, the AMWAC Report¹⁷ concluded that 500 additional trainee pathologist positions were needed by 2008 but only 100 have been funded to date.

4.1.3 Other workers

For other workers in pathology the workforce shortage, while real, appears to be more like the generic workforce shortages experienced across healthcare. This is particularly a problem in those States that have boom industries such as mining where there is strong competition for the same workers.

¹⁷ AMWAC The Specialist Pathology Workforce in Australia - Supply and Requirements 2003-2013 - 2003

4.1.4 Current signs of shortage

Signs that the pathology workforce shortage is having an impact now include:

- vacant positions
- inability to attract appropriate applicants to advertised positions
- additional training required of applicants (especially scientists) because they are not ready
- unable to provide holiday cover for sub-specialists
- closure of facilities such as the cancer care centre in Albury as a result of the retirement of pathologists, which meant correlation could not be done
- long delays in reports especially in disciplines such as genetics and forensics (where it has changed the use of the testing and also caused closures of facilities in NSW)
- a decline in service levels such as examples of the reduced number of courier runs in some public sector laboratories, leading to longer turn-around times for results
- staff are now being flown in on a rotating basis from capital cities to some regional laboratories where they were once staffed locally, leading to a significant increase in operating costs
- complaints from pathologists and scientists of excessive workloads.

4.2 Specific pathology workforce issues

4.2.1 Common

The issues specific to pathology but common to all pathology workforce groups include:

- a lack of understanding and profile of what pathology is and its value and so a lower standing in the community and the healthcare sector
- the option of increasing supply by the use of overseas-trained pathologists and scientists is hampered by a world-wide shortage of well trained personnel, especially in the sub specialties with greatest need such as toxicology
- there is an argument that laboratories are not being used optimally by requesters and that fewer more appropriate requests would result – however, this is balanced against the evidence that if protocols for common diseases (such as diabetes) were being adhered to, many more pathology tests would be ordered (double the number of HbA1c tests for diabetics for example)
- the opportunity to further remodel the workforce is said to be impaired by some of the existing work practices, award structures and regulations.

4.2.2 Medical Scientists

In 2003 Louise McGregor and Helen Moriarty from Charles Sturt University conducted a survey of the professional status of medical scientists in Australia and established that the respondents perceived themselves and the profession to have low recognition, respect and professional autonomy, lack of opportunities for advancements, low autonomy and poor pay. When asked to rate their satisfaction with their pay, only 2% of the 500 respondents were very satisfied, with a further 10% moderately satisfied.

The issues specific to medical scientists include:

- Difficulty in attracting new recruits of appropriate quality because:
 - pay is not competitive - graduates of medical science degrees are poorly paid in comparison with graduates of other courses and in comparison with unskilled workers in some industries
 - there is little or no apparent career structure
 - the hours of work are unsociable
 - suitable education is not available eg cytopathology majors are only offered at UniSA (SA), RMIT (VIC) and Curtin UT (WA) – the cost of medical scientist training is high and so not attractive to universities
 - misleading advice is provided by universities about the appropriateness of certain general biomedical courses as training for work in pathology
 - some courses have an insufficient vocational component and one reason for this is that there are too few placements in laboratories
 - industry/employer need and course content have not always been aligned
 - undergraduate medical science degrees are often now used for entry to postgraduate medical education.
- Difficulty in retaining staff because:
 - career progression is not facilitated – AIMS writes “graduates are routinely employed at a technical level: after that, it is the lack of progression that is particularly irksome and many scientists move from one laboratory to another trying to get up the ladder or just leave for another occupation”
 - career progression for senior scientist is toward a management rather than technical position and so those with knowledge and skills are lost from the service function
 - high proportion of females in the medical science workforce - women who leave the workforce to start a family may not return to the profession, or may return on a very limited part-time basis
 - high levels of responsibility without recognition of knowledge and skills (that might come from registration)
 - low levels of autonomy
 - the work environment is often stressed with continuous driving for efficiency gains
 - the public sector laboratories report being starved of capital and so there is a perception of not being at the cutting edge or indeed doing the job best
 - pay is not competitive and higher paid overseas positions are available that are more attractive
 - retirement becomes more attractive in the light of the issues outlined above.
- Difficulty in re-entry to the workforce because:
 - the knowledge domain and technology is rapidly developing and the opportunity for bridging or upgrading courses are limited

4.2.3 Pathologists

The issues specific to pathologists are different to those of scientists and include that:

- there are too few trainee pathologists because there are too few funded trainee positions – the College maintains that there are interested medical graduates and that there are those willing and able to train but that there are not the training positions available to allow uptake of the traineeships – training is less than 80% of what is needed
- reduced exposure to pathology in medical training and the associated loss of role models is reducing the attraction of the profession and consequently the calibre of trainee
- the current rate of advance of knowledge in pathology makes it difficult to keep pace, especially in the sub-specialties and this is exacerbated when demands on service provision are high
- work-load has got to a level where many pathologists are expressing concerns about the impact on quality and their unwillingness to sustain current workloads
- issues around professional isolation of pathologists working in regional laboratories
- the number training as general pathologists has declined – these pathologists are often well suited to regional laboratories in terms of being able to liaise with the local medical teams but there is a concern that by taking this route, a pathologist takes a career ‘dead-end’ – “jack of all trades but master of none” in a field of increasing complexity
- where pathologists have dual training for example in haematology the tendency is for most time to be spent in clinical practice reducing the availability of these pathologists for laboratory work
- there are specific shortages in the sub-specialties now, including:
 - renal (histopathology)
 - neuropathology
 - paediatric
 - forensic
 - cytopathology
 - genetics and cytogenetics
 - immunopathology.

4.3 The consequences of inaction

There is a real concern that the high standards of quality in Australia are under threat by workforce shortages. This was voted the number one risk in a recent workshop of some 50 senior people on quality in pathology¹⁸.

When asked what would happen if there was no improvement in shortages in the near future, the following were offered as likely outcomes:

- The time taken to provide a pathology report will increase especially in the anatomical pathology and genetics disciplines resulting in
 - compromised care and increased risk to the patient
 - increased patient anxiety
 - reduced efficiency in hospitals including access block and extended stays

¹⁸ National Workshop on Quality and Safety in Pathology November 2007

- Workers will be further stressed leading to
 - an exacerbation of all of the previously identified issues
 - reduced maintenance of skills and knowledge because there is no time to ‘sharpen the saw’
- Increase in the cost of laboratory operations from
 - wages pressure
 - payment of overtime and contractors
 - fly-in fly-out arrangements in regional laboratories
- Increase in costs of dependent services from
 - Emergency Department access block
 - increased length of hospital stay
 - use of more expensive substitutes such as point of care tests
 - increased waste with inappropriate treatment
- Reduced capacity to teach, exacerbating the training shortfall
- Reduced attractiveness of sector and so further loss of recruits to competition
- Miss out on medical advances because of the dominance of the urgent routine work because there is
 - no time for working up new tests in the laboratory
 - no time for research
 - no time for MSAC submissions
- Compromised care and increased risk to the patient from
 - Increased error rates in pathology results
 - Increased length of hospital stay and exposure to infection
 - Inappropriate, delayed or uncontrolled treatment
- Limit the adoption of evidence based medicine and the associated lost opportunity cost, both financial and social.

The experience in other countries such as Canada and New Zealand in recent time shows that these scenarios are not idle conjecture.

The timeframe of demographic change and effect of the impending retirement of the baby boomer generation means that there is a very narrow window of opportunity to commence making the significant structural changes required to mitigate the existing and worsening workforce shortages in the pathology sector. That window has been suggested by a leader of a State Health department (who is also a pathologist) to be as short as 18 months.

5 MITIGATION

As the Productivity Commission described it for healthcare in general, the aim for pathology is to have a more sustainable and responsive health workforce, while maintaining a commitment to high quality and safe health outcomes.

The ways to address the problems with workforce shortage can be considered in the following framework (the elements of which are not mutually exclusive):

- Increase the supply of workers by
 - Improving the image of pathology
 - Increasing the opportunities for education and training
 - Improving recruitment
 - Retaining the workforce longer
 - Attracting re-entry of those who have exited
- Redistribute the workforce from areas of lower to higher demand
 - Geographically
 - By discipline
- Improve the productivity of the workforce by
 - Improving work design
 - Further consolidation
 - The introduction of new technology
- Reduce the demand by
 - Improving the quality of ordering
 - Rationing

A number of innovations and activities were identified during the consultation phase. These and other suggestions are described in the sections that follow, using the strategic framework outlined above.

5.1 Increase the supply of workers

There is a clear need for better information about the pathology workforce and better matching of training to the workplace.

This data is needed on an ongoing basis in order to effectively manage the workforce into the future. Those consulted believe that this management needs to be co-ordinated at a national level but there was no clear consensus on the mechanism that should be adopted.

The following strategies were suggested:

- Conduct a full workforce and workload audit
- Seek inclusion of pathology-related workforce data in the AIHW two yearly reports
- Increase the profile of pathology in the national health-workforce review activities

5.1.1 Improve the image of pathology

It seems clear from the consultation that the image of pathology needs to be addressed and the following are possible ways of doing that:

- Continue and accelerate the work done by the College, and more recently by the Pathology Associations Committee, with programs like ‘National Pathology Week’, PathWay magazine, Careers Days for students and initiatives like ‘Labs are Vital’

- Lobbying for a greater share of medical course time so as to increase students' awareness and understanding of pathology testing and its place in the diagnostic process
- Engage PCC members and their suppliers in an industry-wide program
- Co-ordinate activities through the Pathology Associations Committee to increase the impact and maximise the 'bang for buck'

5.1.2 Increase the opportunities for education and training

Medical Scientists and Technicians

Possible approaches include:

- Better co-ordination of the training by universities for scientists through direct liaison with employers
- Borderless progression of education – allow street-level entry and progression to 'consultant status' as for the UK
- Reintroduce more apprenticeship-oriented or vocationally-based traineeships
- Improve the description of career pathways, starting with national standardisation of naming and job description (if not competencies)
- Quarantine training positions through the application of relevant NPAAC standards
- Regularise the TAFE-level training of technicians to fix the reported issue of variable fitness for purpose of those completing the courses
- Better co-ordinate the education and training provided by scientific societies and those provided by educational institutions
- Support the Academy of Science program promoting science in schools (namely, the *Primary Connections – Linking Science with Literacy* and the *Science by Doing* initiatives) and participate in the Australian Industry Group's *Adopt-a-School* program which promotes linkages between industry and potential future workforce members
- Change reward systems to recognise progressive education and training
- Promote modular training in complementary disciplines, such as in pathology informatics
- Support postgraduate education for the senior scientists
- Provide in-service fellowships for advanced training (as WA has commenced)
- Build closer links between universities and pathology laboratories
- Lobby for the increase of profile of courses by moving them into health/medical faculties
- Marketing and promotion especially using the preferred media of potential students, such as using Facebook and U-tube.

Pathologists

Possible approaches include:

- Increased lobbying of medical schools and other colleges for an appropriate level of teaching of pathology at the undergraduate level and assist with the development of science and case-based teaching modules – this helps with recruiting trainee pathologists and is also likely to improve the quality of use of pathology
- Fund more training positions

- Map training positions to need and make the opportunities well known
- Link Fellowship training with regional medical schools to provide some continuous link with regional laboratories and incorporate rotation to main laboratories so as to prevent isolation and/or marginalisation for future career purposes
- Promote further dual training for clinician-pathologists, such as happens now for haematologists, immunologists and geneticists, so as to increase cross discipline training and also patient contact, relevance and prestige – although this can have the opposite to the intended effect because trained pathologists can be lost from the laboratory to more clinical work
- Provide in-service fellowships for advanced training and retraining ie genetics (as WA has commenced)
- Build closer links between universities and pathology laboratories
- Use of targeted marketing and promotion strategies, especially those using the preferred media of potential students such as using Facebook and U-tube.

5.1.3 Improve recruitment

Medical Scientists and Technicians

Possible approaches include:

- Improve the description of career pathways, starting with national standardisation of naming and job description (if not competencies) and promote the role of science and scientists in healthcare
- Establish registration of medical scientists to increase prestige and recognise responsibility
- Recognise scientist practitioners
- Develop a program to attract disillusioned postgraduate researchers and provide bridging education
- Encourage stronger connections and collaborations between pathology laboratory staff and research institutions
- Recognise appropriate prior experience in a more vocationally-oriented training program
- Expand work experience programs in laboratories
- Establish indentured training programs for scientists
- Use of targeted marketing and promotion strategies, especially those using the preferred media of potential students such as using Facebook and U-tube
- Ensure competitive pay and reward systems.

Pathologists

Possible approaches include:

- Fund additional training positions
- Recognise prior relevant experience, allowing cross-over from other areas of medicine - The College may need to review and refine its specialist development pathways so as to ensure that there are no unnecessary barriers to entry and that the College is taking advantage of current national and international best practice in specialist training.
- Promote the dual training for clinician-pathologists, such as happens now for haematologists, immunologists and geneticists, so as to increase cross discipline training and also patient contact, relevance and prestige — although this can have the opposite to the intended effect because trained pathologists can be lost from the laboratory to more clinical work
- Promote the role of pathology in pre-emptive and personalised medicine
- Marketing and promotion strategies as outlined above.

5.1.4 Retain those in the workforce longer

Possible approaches include:

- Ensure competitive pay and reward systems
- Establish a career path that allows seniority for scientists as practitioners rather than managers
- Give higher recognition to the value of scientists – which is being clearly demonstrated by the impact of a shortage
- Increase the learning culture and establish mentoring programs for personal growth
- Make more flexible the working conditions
- Facilitate a ‘retirement leave and re-entry’ path, encouraging a longer working life
- Give the opportunity to teach and mentor.

5.1.5 Attract re-entry of those who have exited

Possible approaches include:

- Create more flexible working conditions – especially for collectors
- Establish a set of attractive flexible employment conditions for those early in their retirement, including re-training into the field
- Provide financial planning advice.

5.1.6 Provide substitution from those outside the sector

Possible approaches include:

- Training of other specialists in specific sub-specialty and super-specialty areas of pathology (for example, ophthalmic surgeons in histopathology of the eye) and then support them through existing laboratories.

5.2 Redistribute the existing workforce

5.2.1 Geographically

Possible approaches include:

- Regional workforce development
- Geographic-focused recruitment
- Incentives based on location
- Strengthening of formal and informal linkages to regional academic institutions.

5.2.2 By discipline

Possible approaches include:

- Targeted programs to address the biggest gaps, such as those identified in:
 - Cytopathology
 - Forensic pathology
 - Molecular & cytogenetics
 - Toxicology.

5.3 Improve the productivity of the workforce

Industry restructuring with consolidation of laboratories and significant role substitution has already taken place but there are still opportunities for improvement.

5.3.1 Improve work design

Possible approaches include:

- Exploring new roles with untrained entry-level workers
- Expanded use of Point of Care Testing by clinicians
- Substitution
 - More leveraging of professional roles according to identified competencies
 - Creation of “para-pathologist” and “para-scientist” roles
- Clerical support for professionals to allow them to focus on high priority tasks
- Centralisation
 - Specialised laboratories
 - Central review
- Review of public sector pathology award structures
- Removal of restrictions and constraints on progression
- Consideration of the model that has developed with genetics.

5.3.2 Introduce new technology

Possible approaches include:

- Informatics – exploring increasing use of:
 - Digital microscopy and telepathology
 - Voice recognition
 - Decision support, including knowledge management
 - Automation
- Replacement of current testing with more direct molecular techniques, such as identification of bacteria in microbiology
- Further development and adoption of Point of Care testing.

5.3.3 Consolidate further

Possible approaches include:

- Centralisation of specialty laboratory services eg Cancer cytogenetics, Vic; Molecular – haemaglobinopathies, haematology, blood cancers, lysosomal disease.

5.4 Reduce the demand

5.4.1 Improve the quality of ordering

It must be recognised that the application of these strategies may result in an increase in demand because evidence based guidelines often propose more pathology testing than current custom and practice ie the value of testing could be increased but potentially at a cost of increased workload.

Possible approaches include:

- Better teaching of the requesters at undergraduate and postgraduate levels
- Development of “easier to adopt” requesting guidelines
- Provision of electronic decision support with electronic request entry

5.4.2 Rationing

A possible approach includes the use of more rules in the Pathology Services Table.

6 NEXT STEPS

The following actions are seen as the most useful next steps to be undertaken in a comprehensive process of strategic engagement aimed at filling current information gaps and securing the participation with those organisations and individuals that have a stake in the development of appropriate strategies:

- Invite comment from those consulted, in particular from the RCPA, scientific societies, industry groups and education providers, about the range of strategies proposed in this report and their relative priority.
- Engage with the Australian Health Ministers' Advisory Council and its relevant committees (including the National Health Workforce Taskforce Group).
- Engage with other jurisdictional Departments that have a role in pathology workforce planning such as Attorneys General who have a role in forensic pathology.
- Establish a national steering group and agree on the actions to be taken by prioritising the suggestions provided here, and any that may be prompted by review of the report, by assessing them against criteria of importance, 'doability', cost, impact and timeliness in order to draft a strategic plan for action.
- Act on the outcome with a multi-pronged approach.

APPENDIX A – CONSULTATIONS UNDERTAKEN

- DoHA Diagnostic Services Branch
 - Ms Yvonne Korn, Assistant Secretary, Diagnostics and Technology
 - Ms Debbie Stanford, Director, Pathology (Quality) Section
 - Ms Pamela McKittrick, Assistant Director, Pathology Section
 - Ms Suzanne Petrie, Assistant Director, Pathology Section, NPAAC Secretariat
 - Mr Peter Murray
- Royal College of Pathologists Australasia (RCPA)
 - Dr Debra Graves, CEO
 - Dr Tamsin Waterhouse, Deputy CEO
 - Dr Janney Wale, consumer representative
- Australian Healthcare and Hospital Assoc Thinktank on Workforce
- Professor Hal Swerrison, Dean Faculty of Health Science, Latrobe University, Discussion leader
 - 20 others
- UK NHS Chief Scientist Prof Sue Hill - UK pathology workforce reform
 - Dr Beverly Rowbotham, President, RCPA
 - Dr Debra Graves, RCPA
 - Professor Leslie Burnett, Chair, NPAAC
 - Mr Mike Ralston, scientist
 - Dr Michael Whiley, Pathology Queensland
 - Assoc Prof Peter Stewart, RCPA QAP
 - Dr Geoff Fuller, rural pathology, NSW
 - Dr Tony Badrick, scientist
 - Dr Roger Wilson, President, NCOPP
 - Dr Janney Wale, consumer representative
 - Dr David Davies, ACHS pathology representative
 - Ms Penny Rogers, NCOPP
 - Professor Eva Raik, haematologist
 - Ms Megan Nelson, NATA
 - Dr Tamsin Waterhouse, RCPA
 - Associate Professor Ralph Green, RMIT
- State-based Meetings
 - Canberra
 - Dr Peter Flett, WA Health
 - Professor Julia Potter, ACT Pathology
 - Dr Laurie Bott, Sonic Healthcare Pty Ltd
 - Dr Malcolm Mohr, pathologist
 - Dr Glenn Francis, Pathology Queensland
 - Mr Roger Killeen, consumer representative
 - Dr Michael Harrison, Chair, QUPC
 - Sydney
 - Dr John Merlino, ASM
 - Mr Dennis Mok, ASM
 - Professor Eva Raik, Haematologist
 - Dr Renze Bais, AACB
 - Dr John Earle, AACB

- Dr Roger Wilson, President, NCOPP
- Melbourne
 - Associate Professor Ralph Green, Discipline of Laboratory Medicine, RMIT University
 - Dr David Thorburn, President, HGSA
 - Dr Surender Juneja, Haematologist
 - Professor Ruth Salem, Anatomical Pathologist
 - Dr Elizabeth Benson, Immunopathologist
- Brisbane
 - Ms Robyn Wells, Royal Brisbane Hospital, Scientist Haematology
 - Ms Jan Noble, CEO, AIMS
 - Dr Tony Badrick, Laboratory Manager, Sullivan and Nicolaides
 - Dr Michael Harrison, Chair QUPC, CEO Sullivan and Nicolaides Pathology
 - Dr Bev Rowbotham, Haematologist, President RCPA
- Draft Report Review by Committees
 - Draft Report reviewed by the Quality Use of Pathology Committee at its meeting of August 214, 2008 and the comments incorporated
 - Draft Report reviewed by the Pathology Consultative Committee at its meeting of September 4, 2008 and the comments incorporated
 - Revised Draft Report reviewed by the National Pathology Accreditation Advisory Council at its meeting of September 11, 2008 and the comments incorporated

APPENDIX B – REPORTS, PAPERS AND SUBMISSIONS

- Australian Governments
 - COAG
 - COAG Productivity Commission 2005, Australia's Health Workforce, Final report, Canberra See document: Productivity Commission Australia's Health Workforce.pdf
 - AHMAC National Health Workforce
 - Work Program - See document: AHMAC NHWT work program 2008-09.pdf
 - Committee Structure - See document: AHMAC Workforce committee structure 2008.pdf
 - AMWAC The Specialist Pathology Workforce in Australia - Supply and Requirements 2003-2013 – 2003 - See document: AHMAC AMWAC The specialist pathology workforce in Australia.pdf
 - AHMAC Call for submissions on partially regulated professions - See document: AHMAC Call for submissions on partially regulated professions.pdf
 - Australian
 - DoHA The Australian Medical Workforce Aug 2001 See document: DoHA The Australian Medical Workforce Aug 2001.pdf
 - NHHRC submissions on Pathology Workforce
 - Pathology Associations Committee NHHRC submission on Workforce May 2008 - See document: PAC Pathology Associations NHHRC submission on Workforce May 2008.pdf
 - RCPA NHHRC submission on Workforce May 2008 - See document: RCPA NHHRC submission on Workforce May 2008.pdf
 - RCPA NHHRC Submission on Genetic Testing May 2008 - See document: RCPA NHHRC Submission on Genetic Testing May 2008.pdf
 - HISA NHHRC Submission on Workforce May 2008 - See document: HISA NHHRC Submission on Workforce May 2008.pdf
 - HGSA NHHRC submission May 2008 - See document: HGSA NHHRC submission May 2008.pdf
 - VCGS NHHRC submission May 2008 - See document: VCGS NHHRC submission May 2008.pdf
 - Pathology Section
 - QUPP
 - QUPC Pathology teaching in pre and vocational training - May 2003 HMA - See document: QUPC Pathology teaching in pre and vocational training - May 2003 HMA.pdf
 - QUPC Undergraduate Pathology Teaching 2001 HMA - See document: QUPC Undergraduate Pathology Teaching 2001 HMA.pdf
 - National Workshop on Quality and Safety in Pathology November 2007 - See document: National Workshop on Quality and Safety in Pathology.pdf

- QUPC Workforce Issues Paper - See document: QUPC Workforce Issues Paper.pdf
 - NPAAC
 - NPAAC Pathology Workforce Census 2007 Pathologists July 2008 - See document: NPAAC Pathology Workforce Census 2007 Pathologists July 2008.pdf
 - NPAAC Pathology Workforce Projections July 2008 - See document: NPAAC Pathology Workforce Projections July 2008.pdf
 - NPAAC Supervision Document 2007 - See document: NPAAC Supervision Document 2007.pdf
 - NHMRC
 - NHMRC Transforming Medicine Through Discovery NIH Pres Jan 2008 Zerhouni - See document: NHMRC Transforming Medicine Through Discovery NIH Pres Jan 2008 Zerhouni.pdf
 - ABS
 - ABS 2006 Census by health occupation Feb 2008 - See document: ABS 2006 Census by health occupation Feb 2008.pdf
 - AIHW
 - AIHW Australia's Health 2008, Chapter 8.2 Workforce - See document: AIHW Australia's Health 2008.pdf
 - To get
 - Bio-security Workforce & Surge Capacity
 - NHMRC Consumer study
- NSW
 - NSW Health 2008, Pathology Workforce Forum, DLA Phillips Fox & David Dixon - See document: NSW Health Pathology Workforce Forum April 2008.pdf
- WA
 - WA The Defining Decade 2009-2016 Flett July 2008 - See document: WA The Defining Decade 2009-2016 Flett July 2008.pdf
- Vic
 - Victorian DoH workforce survey of Scientists - Being undertaken
- Australian Colleges & Scientific Societies
 - RCPA
 - RCPA Pathology Workforce Shortage Fact File July 08 - See document: RCPA Pathology Workforce Shortage Fact File July 08.pdf
 - RCPA The Impact of the Pathology Workforce Crisis on Acute Healthcare in Australasia - See document: RCPA The Impact of the Pathology Workforce Crisis on Acute Healthcare in Australasia.pdf
 - RCPA NZ Workforce Analysis Pathologists 2007 - See document: RCPA NZ Workforce Analysis Pathologists 2007.pdf
 - RCPA NHHRC submission on Workforce May 2008 - See document: RCPA NHHRC submission on Workforce May 2008.pdf
 - RCPA NHHRC Submission on Genetic Testing May 2008 - See document: RCPA NHHRC Submission on Genetic Testing May 2008.pdf

- RCPA Work Environment Survey August 2007 - See document: RCPA Work Environment Survey August 2007.pdf, Summary - See document: RCPA Work Environment Survey August 2007 - Summary.pdf
- RCPA Quality of pathology services Aug 2008.pdf - See document: RCPA Quality of pathology services Aug 2008.pdf
- PAC
 - Pathology Associations Committee Meeting July 2008 - Draft Minutes - See document: PAC Pathology Associations Committee Meeting July 2008 - Draft Minutes.pdf
- AIMS
 - AIMS Submission on workforce Aug 2008.pdf - See document: AIMS Submission on workforce Aug 2008.pdf
 - AACB AIMS Is there a future for medical scientists and their associations - Badrick October 2006 - See document: AACB AIMS Is there a future for medical scientists and their associations - Badrick October 2006.pdf
- AACB
 - AACB AIMS Is there a future for medical scientists and their associations - Badrick October 2006.pdf - See document: AACB AIMS Is there a future for medical scientists and their associations - Badrick October 2006.pdf
- ASC
 - ASC Cytology Advanced Practitioner Summary Dec 2007 - See document: ASC Cytology Advanced Practitioner Summary Dec 2007.pdf
 - ASC Submission on workforce Aug 2008 - See document: ASC Submission on workforce Aug 2008.pdf
- HGSA
 - HGSA NHHRC submission May 2008 - See document: HGSA NHHRC submission May 2008.pdf
 - VCGS NHHRC submission May 2008 - See document: VCGS NHHRC submission May 2008.pdf
- HISA
 - HISA NHHRC Submission on Workforce - See document: HISA NHHRC Submission on Workforce.pdf
- AHHA
 - AHHA Think Tank on Workforce - Hal Swerrison LaTrobe - See document: AHHA Think Tank on Workforce - Hal Swerrison La Trobe July 2008.pdf
- Education institutions
 - RMIT
 - RMIT Laboratory Medicine pathways 2008 - See document: RMIT Laboratory Medicine pathways 2008.pdf
 - La Trobe
 - AHHA Think Tank on Workforce - Hal Swerrison LaTrobe - See document: AHHA Think Tank on Workforce - Hal Swerrison La Trobe July 2008.pdf
 - Charles Sturt

- Charles Sturt Uni The professional status of medical scientists in Australia 2003 McGregor & Moriarty - See document: Charles Sturt Uni The professional status of medical scientists in Australia.pdf
- Other Australian
 - Standards Australia - Standards Used in the Australian Health Sector 2003 - See document: Standards Australia - Standards Used in the Australian Health Sector 2003.pdf
- Overseas
 - UK
 - UK NHS A High Quality Workforce Jul 2008 - See document: UK NHS A High Quality Workforce Jul 2008.pdf
 - UK NHS Career Framework for Scientists 2008 - See document: UK NHS Career Framework for Scientists 2008.pdf
 - UK NHS Modernising Scientific Careers flyer 2008 - See document: UK NHS Modernising Scientific Careers flyer 2008.pdf
 - UK NHS Standards for the Medical Laboratory Sep 2007 - See document: UK NHS Standards for the Medical Laboratory Sep 2007.pdf
 - RCPATH Advanced practitioners in laboratory medicine informatics Jan 2008 - See document: RCPATH Advanced practitioners in laboratory medicine informatics Jan 2008.pdf
 - New Zealand
 - NZ Further Considerations Extended Role of Medical Laboratory Scientists Jul 2008 Legge - See document: NZ Further Considerations Extended Role of Medical Laboratory Scientists Jul 2008 Legge.pdf
 - NZ Extended Role of Medical Laboratory Scientists Jan 2008 Legge - See document: NZ Extended Role of Medical Laboratory Scientists Jan 2008 Legge.pdf
 - Canada
 - Canada Pathology workforce issues Jun 2008 - See document: Canada Pathology workforce issues Jun 2008.pdf
 - US
 - US Strategic Challenges Facing Hospital Based Pathology - See document: US Strategic Challenges Facing Hospital Based Pathology.pdf
- Underway
 - RCPA Medical School Survey to be conducted end 2008
 - Victorian DoH workforce survey of Scientists