Government of **Western Australia**
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Medical Workforce Report 2013/14

Profiling, Performance, Programs and Priorities

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Contents

1. Introduction

The Western Australian public health sector (WA Health) is facing increasing pressure to meet the growing demand for healthcare services; it has the second lowest specialist to population ratio in Australia and is functioning within a tight fiscal environment, while adapting to an activity based funding/management (ABF/M) model. WA Health's ability to deliver a high quality health service in the future will be totally dependent upon the capacity to supply, and equitably distribute, an appropriately skilled medical workforce to meet this demand.

The *Medical Workforce Report 2013/14* (MW Report) has been developed to inform the planning process and ensure that the specialist medical workforce (specialist workforce) is of appropriate size, composition and distribution to meet the health care needs of Western Australia (WA). There are four key areas identified in this report, with a focus on the years 2013 to 2021:

1. **Profiling:** Provides a profile of the current medical workforce in WA, past trends and future demand and supply.
2. **Performance:** Identifies measures to capture key supply issues for the medical workforce within the 'equity, 'effectiveness' and 'efficiency' performance framework.
3. **Programs:** Provides an overview of the programs that are being developed and/or implemented by the WA Department of Health's (the Department) Medical Workforce Branch (MWB), Office of the Chief Medical Officer (OCMO).
4. **Priorities:** Identifies key priorities for 2014/15.

2. Executive Summary

It is essential that medical workforce policy and planning is proactive in order to meet future supply requirements, and to ensure the appropriate volume and mix of consultants is available to meet the growing demand for services. Medical graduate numbers have increased significantly since 2011, leading to increased competition for prevocational and vocational training places, and greater demand for consultant positions. In addition, across all levels and specialities, the medical workforce is looking for improved work/life balance and there is a growing trend towards part-time hours. These issues, combined with an ageing and growing population, increasing levels of chronic disease, and an ageing workforce, highlight that medical workforce reform in WA is essential.

The MW Report discusses the context in which the WA specialist workforce functions, including national and state medical workforce initiatives, and the implementation of ABF/M; supply and demand drivers; medical workforce needs for equitable, effective and efficient health services in WA; supply and demand modelling; and culminates in the identification of key findings, proposed strategies and specific priorities for MWB in 2014/15.

An in depth analysis of the specialist workforce in WA (excluding general practitioners (GP)[1]) provides a snapshot for 2013; projects supply and future demand for the consultant workforce for each of the 45 identified specialities to 2021; and applies a standardised risk assessment tool to identify specialties at high or critical levels of shortfall that may require targeted intervention. The data indicates that in 2013 there was a large imbalance of supply and demand between the various specialties; with many specialties in shortfall and a few in excess. It also identifies that the current levels of vocational trainees are insufficient to meet future demand for consultants in many specialties, and that the number of specialties at high or critical risk levels will increase from 10 in 2013 to 19 in 2021 if no intervention is undertaken in the interim.

The conclusion is made that reform is needed now if WA is to have an adequate specialist workforce to meet future demand. Strategies are recommended in the MW Report at each level of the medical workforce to address the disparity in supply and demand within the ABF/M environment. Three key strategies have been identified as priorities in the short, medium and long term; however, consideration will also be given to alternative strategies for delivering healthcare such as introducing new or expanded roles, and increasing medical student numbers. These models are mentioned in this report but require further in-depth research and analysis to determine their applicability to WA Health.

The key strategies identified in this report are summarised below:

1. Optimising the consultant workforce

The Optimal Consultant Allocation Model (OCAM) is an evidence-based allocation model which, applied annually, would ensure that the consultant workforce, volume and mix is optimised to service current and future growth in service delivery demand within an ABF/M environment. The application of OCAM within WA Health has the potential to:

- Reduce any surplus of consultants in oversupplied medical specialties by natural attrition (i.e. retirements) and to address shortages in undersupplied medical specialties.
- Maximise potential funding revenue in an ABF/M environment while maintaining a quality health service.
- Assist in optimising the consultant workforce at hospital, health service and whole-of-state levels.
- Be effectively utilised regardless of the given current economic environment.

[1] Data collection and analysis of the GP workforce is undertaken by other State and Australian Government agencies.

OCAM is a long-term strategy with an immediate short-term impact. The model ensures rapid movement towards an optimal workforce volume and mix of consultants, as well as the potential for increased funding revenue. The following points illustrate how OCAM could be applied:

- Collaboration between health services with planning to increase consultant numbers in agreed specialties within existing budgets and at the current annual growth rate of consultant numbers.
- Utilising Full-time equivalent (FTE)/funds from retiring consultants in oversupplied specialties to increase FTE in undersupplied medical specialties.

Preliminary modelling has shown the following short-term impacts, should OCAM be applied:

- Elimination of shortfalls in the surgical and core support service specialties in the first year (with maintenance thereafter).
- Elimination of shortfalls in the medical specialties with a current high or critical shortfall risk in the second year (with maintenance thereafter). OCAM ensures that once all high and critical shortfall risks have been eliminated, the occurrence of a medical specialty reaching a high or critical level would be a rare event.
- Reducing all 2021 consultant shortfalls to low and medium shortfall risks by end 2017 (four years in advance).

2. Increasing vocational training capacity

In a number of medical specialties the expected number of vocational trainees will be insufficient to replace the anticipated retirements. To increase WA's vocational training capacity:

- Continued collaboration between the Department, specialist medical colleges (colleges) and health services is needed to ensure there is the optimal number of funded training positions in place for each specialty.
- Alternative models of vocational training, such as the expansion of training into the private sector and community-based training, will need to be explored further.

Building WA's vocational training capacity is a continuous medium to long-term strategy. The impact of any successful increase in vocational training will not be realised for several years due to the length of vocational training; therefore, increasing vocational training positions in 2015 will have a minimal/negligible impact on reducing consultant shortfalls by 2021.

3. Maximising utilisation of service registrar positions

Service positions are an integral component of service delivery in WA Health; providing valuable support to consultants, and supervision to junior doctors. For many individuals holding service registrar positions, those positions are an interim measure; however, other service registrars choose to provide long-term service within the hospitals as a career option. The increase in competition for vocational training places and consultant positions means that there will be increasing numbers of medical practitioners sitting in service positions, either temporarily or long term.

There are two key strategy aspects discussed in this report to better utilise service registrar positions:

1. Funding: Neutral conversion of some service positions into vocational trainee positions, as appropriate, in collaboration with the colleges and health services.
2. Alternative career pathway: Investigation into the feasibility of developing an alternative career pathway, including further education and professional development, for experienced non-specialist medical practitioners working in hospitals, such as a hospitalist or career medical officer pathway, similar to that offered in New South Wales (NSW)[2].

[2] NSW Government Health, NSW Health Senior Hospitalist Initiative: http://www.health.nsw.gov.au/training/hospitalist/pages/default.aspx

In addition to the strategies proposed above, a number of medical workforce programs are already underway that support the development of the medical workforce in WA. These include the:

- Specialist Workforce Capacity Program (SWCP)
- Junior Doctor Business Case (JDBC)
- Area of Need (AoN)
- Workplace-based Assessment (WBA)
- Generalist Medical Workforce Program (GMWP)

The implementation of new strategies and the continuation of existing programs could form a framework for the development of a balanced medical workforce in WA that maximises the funding available to provide an equitable, effective and efficient health service in to the future.

3. Context

3.1 National directions

3.1.1 Australia's Health Workforce 2005

In 2005, the Council of Australian Governments (COAG) requested that the Australian Government's Productivity Commission undertake a research study to examine health workforce issues; including the supply of, and demand for, health workforce professionals over the subsequent ten years. The resulting report, *Australia's Health Workforce 2005*[3], highlighted the need for an urgent national response to manage the significant workforce challenges that were identified. Recommendations included: improving efficiency in health workforce planning; creating linkages between health service planning and the education sector; and workforce-related policy measures to ensure efficient and effective delivery of quality health services.

3.1.2 National Partnership Agreement on Hospital and Health Workforce Reform

In November 2008, COAG signed the *National Partnership Agreement on Hospital and Health Workforce Reform* which identified the need for improving health workforce capability and supply, and recognising workforce development as a key enabler of a sustainable healthcare system for Australia.

3.1.3 National Health Reform Agreement

In August 2011, the *National Health Reform Agreement* (NHRA) was entered into by the Australian Government and all states and territories. The intention was to work in partnership to improve health outcomes for all Australians and ensure the sustainability of the Australian health system. Key components of the NHRA reforms were the establishment of the National Health Performance Authority and the development of the Performance and Accountability Framework (PAF). The PAF aims to improve accountability and underpins health reporting across three domains: equity, effectiveness and efficiency of service delivery in health care.

3.1.4 Review of Australian Government Health Workforce Programs, (Mason Review), April 2013

Undertaken by Health Workforce Australia (HWA), the Mason Review assessed all health workforce programs funded by the Australian Government. Some of the main themes identified were: the need to focus on health services to prioritise improving the health of the population over meeting the needs of practitioners and institutions; the systemic focus on expensive and specialised acute care in tertiary metropolitan settings and the need to move to generalist-led care; and the inadequate distribution of services in rural and remote locations, especially taking into account disadvantaged population groups.

Since the completion of the Mason Review, HWA has been disestablished. Some of HWA's programs are being continued by the Australian Government Department of Health.

3.1.5 Key national groups

Health workforce reform and policy issues remain key areas of discussion at a national level through COAG, the Standing Council on Health, and the Australian Health Ministers' Advisory Council.

[3] Australia's Health Workforce 2005, Australian Government, Productivity Commission.

3.1.6 Special purpose initiatives

The Australian Government has established a number of special purpose initiative packages that impact on supply, at least for the duration of the program. Such programs include the Closing the Gap Initiative, Chronic Disease Strategy and Medical Benefits Schedule (MBS)[4].

Specific workforce supply initiatives and programs such as the Specialist Training Program (STP), Increased Clinical Training Capacity program, Rural Health Continuing Education sub-program, Rural Pharmacy Workforce Program, Prevocational General Practice Placements Program (PGPPP), Australian General Practice Training program, Commonwealth Medical Internships initiative, Nursing and Allied Health Scholarship and Support Scheme, and the recently announced Medical Rural Bonded Scholarship Scheme (2014), are aimed at addressing issues, inequities and barriers in health service delivery.

The STP and PGPPP both assist in providing opportunities in the private and rural sector but the future of both programs is uncertain. The Australian Government ceased funding the PGPPP at the end of 2014, which has implications on the state budget if the program is to continue in WA. The projected costs of the rebranded Community Residency Program (CRP) in WA ($4.2 million in 2015) and the limited access to Medicare provider numbers for participants, will impact on WA's capacity to continue the program long term.

The STP funds $100,000 towards the salary of each new registrar training position established in the private or rural sectors. In 2013 and 2014, WA received $3.4 million (M) in Australian Government funds for a total of 34 positions. The Australian Government is currently reviewing the STP and has no funding rounds scheduled.

Other initiatives include the House of Representatives Standing Committee on Health and Ageing (2012) *Lost in the Labyrinth: Report on the inquiry into registration processes and support for overseas trained doctors*[5] (the Report) which highlighted the healthcare systems' reliance on International Medical Graduates (IMGs), particularly in rural and remote communities, and the administrative challenges faced by IMGs to become registered in Australia. Implementation of the recommendations of the Report has resulted in more streamlined specialist pathway and competent authority pathway processes for IMGs (from 1 July 2014). The Standard Pathway (WBA) for IMGs was supported by the Report and it was recommended that endorsement be extended from State and Territory Governments, and host sites be increased across Australia. For further information refer to the WBA section of this report on page 48.

3.2 Medical Workforce Branch

MWB is part of the Department's OCMO; a key office responsible for health sector planning and the provision of advice to Government, and a significant part of the broader WA health system. MWB has a mandate to conduct strategic research, planning and projects to help ensure that the specialist workforce in WA's public health system is of the appropriate size and composition to continue to meet the State's healthcare needs.

MWB has close strategic and operational links with a broad range of key stakeholders, including health services, individual hospital sites, private sector health service providers, colleges and Australian Government agencies. It has used these key contacts to assist in the profiling of the specialist workforce; the programs that have been produced; and the determination of key priorities for 2014/15.

WA Health is working towards meeting the challenges of a growing population and an ageing demographic through the development of a 10-year strategic workforce plan, informed by the *WA Health*

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[4] Others include the National Mental Health Strategy, Immunise Australia Program, National Women's Health Policy and Pharmaceutical Benefits Scheme

[5] House of Representatives Standing Committee on Health and Ageing (2012) *Lost in the Labyrinth: Report on the inquiry into registration processes and support for overseas trained doctors*. Source: http://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=haa/overseasdoctors/report.htm

Clinical Services Framework 2010-2020 (CSF 2010), which will ensure that health workforce planning is aligned with demand.

3.3 Specialist Workforce Capacity Program

A key achievement of MWB in 2011 was the commencement of the SWCP; a program aimed at biennially mapping WA's specialist workforce to inform workforce planning at a state, territory and national level. The consultation, workforce analysis and modelling, and recommendations of the SWCP form the basis for the development of targeted intervention strategies for specialties identified to be in shortage.

Consultation with the specialty workforces undertaken during SWCP 2011 identified four overarching priorities that support the development of adequate and sustainable specialist workforces in WA, which are:

1. **Recruitment and retention:** Identifying where WA needs specialists and, subsequently, what training infrastructure and consultant posts are needed; improving recruitment and retention packages for specialists; and IMG recruitment and retention processes.
2. **Vocational training:** Negotiating with colleges for WA (local) rather than interstate trainees; expanding early career exposure to private practice, outer metropolitan and rural and remote settings; and identifying opportunities for the promotion of medical specialties perceived to be less popular career choices.
3. **Support resourcing:** Utilising hospital 'clusters' (rural and remote, metropolitan, outer metropolitan and private) and shared resourcing.
4. **Changing requirements:** Identifying alternative career pathways; and planning for the expansion of multi-disciplinary teams and the 'hub and spoke model'

The data from SWCP 2011 has assisted in identifying specialist workforce trends from 2011 to 2013, and informed improvements to the data collection process for SWCP 2013.

3.4 Demand issues

The following are the key drivers contributing to the increasing demand for an accessible, affordable and effective specialist workforce for WA. Although the development of strategies to address these key drivers is not the remit of MWB, they are contextual issues which must be considered when developing strategies to address imbalances in supply and demand.

3.4.1 Population growth

WA had the fastest growth rate in Australia between June 2001 and June 2011, with an estimated 24% growth in population[6]: High population growth implies a corresponding high demand for health services. This is particularly noticeable in the outer metropolitan areas surrounding Perth, where rapid population growth has meant there are insufficient local medical professionals to meet demand.

3.4.2 Ageing population

The impact of an ageing population on the demand for health services is well established. An ageing population changes both the mix and volume of medical procedures and services required due to the impact of ageing on general well-being. The ageing population is also reflected in the age of the consultant workforce. This will be discussed later in the report.

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[6] Australian Bureau of Statistics (ABS). (2011), *Population by Age and Sex, Regions of Australia, 2011: Western Australia*. Source http://www.abs.gov.au/ausstats/abs@.nsf/Products/3235.0~2011~Main+Features~Western+Australia?OpenDocument on 1 October 2014.

3.4.3 Aboriginal population

WA has a high proportion of its Aboriginal population residing in communities in remote locations: in 2006, the proportion was 41%[7]. Providing equity and access to health care services in rural and remote areas is problematic, compromised by both distance and time, and is significantly more expensive; however, there is a significant gap between Aboriginal and non-Aboriginal health outcomes in all locations.

Aboriginal health is most at risk under an ABF/M framework, especially the widespread and common practice of "opportunistic medicine" practiced in northern and central Australia. Opportunistic medicine is the practice of treating all the patients' medical issues when the patient presents for a specific issue. The practice is highly efficient in terms of minimising expensive transportation costs in remote areas, good medicine for the patient (as it minimises the likelihood of future presentation with more seriously progressed disease or condition) and is providing a "quality health care service". Opportunistic medicine is unrewarded under the ABF/M framework.

3.4.4 Chronic disease

The increased prevalence of chronic disease is currently one of the strongest drivers of demand for health services. The ageing of the population and the prevalence of chronic disease are strongly correlated. Growth in health service delivery based demand is higher for chronic disease (about 3.5% to 4.5% per annum, SWCP 2013 data) than for acute conditions (about 2.5% to 3.5% per annum, SWCP 2013 data). Chronic disease is a major contributor to premature death, long term disability, increased hospital admissions and increased health expenditure, accounting for approximately 80% of Australian health expenditure[8].

3.4.5 Acute disease and injury

Acute disease and injury demand for health services has three identifiable drivers:

1. Growth in population: with acute disease and injury incidence rates increasing at a parallel rate across the entire health system.
2. Seasonal demand: i.e. disease related (e.g. influenza) or lifestyle activity related (e.g. sport or recreation injury). It is essential that workforce planning accommodates the seasonal demand component of acute disease and injury in planning models.
3. Catastrophic events of variable origin: timing, duration and magnitude cannot be predicted and the subset of health delivery services required may be partly known (disaster planning has been undertaken) or unknown.

3.4.6 Ability and willingness to pay

Willingness or ability to pay is an increasingly important demand driver in an economically restricted environment. Most individuals have a limit to what they can afford or are willing to pay, and this is often the cause for persons presenting with increased severity of illness. This issue predominantly affects individuals in low to medium socio-economic populations, particularly in rural, remote and outer metropolitan areas; and Aboriginal communities in remote areas where the combination of poverty, distance, culture and timely access to health services act as barriers[9].

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[7] ABS. (2006), Population distribution, Aboriginal and Torres Strait Islander Australians, Canberra

[8] NHPAC. (2006). National Chronic Disease Strategy. Canberra

[9] Aboriginal and Torres Strait Islander Social Justice Commissioner. (2005). *Social Justice Report,* Human Rights and Equal Opportunity Commission, Sydney.

3.4.7 Impact of activity based funding/management

Under ABF/M, the ultimate responsibility for hospital health service delivery rests with State and Territory Governments. The Australian Government guarantees a fixed amount of funding (with agreed annual increment formulae) and each state or territory must compete for its fair share based on reported hospital activity with adjustment for Aboriginal patients and residential location (remoteness). States and territories are responsible for funding the difference between their actual health expenditure and the ABF/M entitlement received from the Australian Government.

Opportunities for funding under ABF/M can be maximised by increasing activity subject to available funding. An ABF/M environment can be advantageous for the expansion of services within a state or territory, with hospitals that focus on providing a quality health service associated with an increase in measured hospital activity gaining the rewards. Under ABF/M there is a tendency to expand “profitable” services and reduce “non-profitable” services resulting in a change of service delivery mix. The expansions and reductions do not necessarily reflect patient service demand.

Clinical management across sites and across disciplines can also negatively impact on funding in an ABF/M environment. The decision by a single hospital to cut services, or the inaccurate measurement by discipline of a multi-disciplinary activity, will result in a reduction of funding revenue for all other ABF/M (non-block funded) hospitals in the state or territory.

3.4.8 Health infrastructure projects

Changes to health infrastructure can have a major impact on demand for medical services, but can also affect the supply of the medical workforce, especially if hospital sites are being combined or services are being transferred between sites. WA Health is investing more than $7 billion in building new hospitals and improving existing health facilities between 2008 and 2018, with support from the Australian Government and other partners, to boost and strengthen healthcare closer to where people live. These projects are being undertaken in the metropolitan and outer-metropolitan areas, as well as rural and remote locations.

New health infrastructure is likely to be state-of-the-art and should support the more efficient delivery of healthcare. It also provides an opportunity to explore alternative models of care delivery and to incorporate and expand the role of the multidisciplinary team. These infrastructure projects and the benefits they provide will have a positive influence of recruitment and retention of medical staff in WA.

3.4.9 Community expectations

The Australian public demands equity of access and provision of a quality health care service that will be there when they need it. An increase in the volume of health information in the media, along with improved public access to health services, rising incomes, and advances in diagnoses and treatments, have led to increased consumer education, awareness and expectations[10]. Research has shown that less than 10% of the Australian population consumes 90% of Australian health expenditure[11].

Community expectations can be measured at different levels (i.e. societal and personal) and are affected by previous experience and level of knowledge about healthcare (i.e. those with more experience and knowledge will be more likely to have more reasonable or realistic expectations). While Australian consumers have very specific expectations around healthcare financing, healthcare funding is not infinite.

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[10] Australian Health Workforce Advisory Committee, Australian Medical Workforce Advisory Committee and Australian Health Workforce Officials’ Committee. (2005). *Demand For Health Services and the Health Workforce - Information Paper*, Health Workforce Information Paper 3, Sydney

[11] Australian Institute of Health and Welfare (AIHW). (2014). *Health Expenditure Australia 2012-2013*, Health and welfare expenditure series no 52, Canberra

Expectations of healthcare can be identified as reasonable or unreasonable. The Winnipeg Regional Health Authority's Board requested the Community Health Advisory Councils to investigate expectations of the healthcare system. Their resulting 2010 report identified the following reasonable and unreasonable expectations of a healthcare system[12].

Reasonable:

- The right to primary care.
- Timely access to primary care, fair and equitable access to health care for all.
- Timely access to specialists, diagnostics and treatment.
- Respectful and compassionate care.
- Electronic medical records.
- More resources provided for disease prevention and health promotion.
- Use of most current technology.
- That health care is provided in the community, as much as possible.
- That healthcare should do no harm.
- That healthcare providers communicate clearly and transparently to patients.
- That people receive the results of diagnostic tests no matter what the results reveal.

Unreasonable:

- That the health care system can fix everyone and that people do not have any responsibility for their own well-being.
- That funding for health care is infinite.
- That people with non-urgent medical issues receive immediate access to care at emergency departments.

3.4.10 Health innovation and reform

Innovation and reform in healthcare aims to provide a more effective, efficient and accessible health service to better address community needs. This can be achieved through advances in medical technology, improved models of care and maximising workforce capacity.

- Advances in medical technology impact on both demand and supply, and have resulted in the reduction and improvement of medical procedures and reduction in prevalence of significant diseases.
- Models of care are evidence-based frameworks describing the right care, at the right time, by the right person/team in the right location across the continuum of care[13]. Research and advances in technology contribute to improvements in these models of care over time.
- Maximising workforce capacity requires an understanding of the profile of the medical workforce, future demand and supply; and how this analysis is then affected by advances in medical technology and changes to models of care.

With reduced access to health care for rural and remote communities, the establishment of primary health care networks including nursing outposts, Visiting Medical Practitioners (VMPs), co-ordinated drive-in-drive-out and fly-in-fly-out specialist services managed by WA Country Health Service (WACHS), and the use of e-health technology are instrumental in removing access barriers and servicing prior unmet demand.

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[12] Community Health Advisory Councils (2010), *Public Expectations of the Health Care System*, Winnipeg Regional Health Authority.

[13] The WA Health Clinical Services Framework 2010–2020 (CSF 2010)

Consideration is being given to alternative ways of delivering healthcare in Australia, especially in rural and remote locations. Employing Physician Assistants (PA's) and expanding the scope for Nurse Practitioners, Aboriginal Health Workers and Pharmacists[14] are models that have been researched and/or explored to some degree.

Queensland Health (QH), South Australia and New Zealand piloted the PA role in 2009 and 2010 to determine its feasibility. A number of PA's have graduated from the training program conducted by James Cook University in Queensland, and QH has recently adopted a governance framework[15] that provides a standard approach to the engagement and clinical governance of PAs to ensure quality and safety of service provision. PAs employed by QH will have the authority to prescribe, refer to medical specialists and order diagnostic tests, but will not be recognised under the Pharmaceutical Benefits Scheme and MBS. QH health services will be able to employ PA's based on the local community's health needs, appropriate service delivery models and the clinical skill mix requirements.

Further consideration and research is needed to determine how alternative roles and expanded scopes could apply in a WA Health context. Consideration should also be given to how these roles might compensate for shortfalls in the medical workforce, and relate to or differ from existing roles, particularly in rural and remote locations which experience both the greatest need and the more substantial implementation issues.

Planning for the future medical workforce in WA should take into consideration innovation and reform initiatives, including expansion of scopes of practice, and promotion and support of the generalist medical workforce (generalist workforce) in outer metropolitan, rural and remote areas.

3.5 Data collection

Nationally and locally there has been a focus on accurately capturing the profile of the specialist workforce to inform future planning. In WA, some sources of data, such as birth data, are delayed; while other sources, such as outpatient data, are still under development. The accuracy of the data impacts on specialist workforce demand projections, significantly for those specialties that are largely outpatient-based.

Some issues that have arisen during the data collection process include capturing:

- Dual trainees accurately nationally and locally.
- Distribution of the specialist workforce in the private sector.
- Consultants who provide visiting medical services to rural and remote locations.

It is particularly important in an ABF/M environment that WA data is captured accurately to ensure appropriate distribution of funds. Ongoing conversations with relevant stakeholders are assisting in this process.

3.6 Data sources

The following data sources have been used in the profiling of the medical workforce for the MW Report.

3.6.1 Annual centralised intern application data

All medical graduates seeking internships in Australia apply through a centralised application and allocation system in each state. In WA, the Postgraduate Medical Council of WA (PMCWA) is responsible for processing intern (postgraduate year 1 or PGY1) applications, allocating interns to hospitals, and providing recommendations to the Medical Board of Australia (MBA) at the end of each year. PMCWA has a complete annual record of WA's PGY1 workforce.

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[14] Duckett, S. Breadon, P. 2013, Access all areas: New solutions for GP shortages in rural Australia. Grattan Institute.

[15] Queensland Department of Health 2014. Physician Assistant Clinical Governance. Accessed from: http://www.health.qld.gov.au/qhpolicy/docs/gdl/qh-gdl-397.pdf

3.6.2 Annual centralised resident medical officer application data

Approximately 80% of resident medical officers (RMOs) in WA are employed annually via a centralised on-line application and allocation process managed by PMCWA. RMO data is accurate for all RMOs that applied for contracts for the following calendar year utilising the centralised process[16].

Data sharing and analysis confirmed the additional number of RMOs that did not participate in the centralised process in WA in 2013. These include:

- RMOs located at King Edward Memorial Hospital (KEMH), Princess Margaret Hospital (PMH) and private hospitals.
- Individuals on two year public sector contracts (2014 to 2016) or those recruited mid-year directly by the hospitals and health services through hospital-specific recruitment processes (generally to replace those RMOs that have accepted registrar posts or returned overseas).

In 2014, both PMH and KEMH participated in the centralised process.

Supplementary RMO employment data has been sought by PMCWA in order to develop a longitudinal dataset which will enable better and more targeted workforce planning. Development of a database to capture and store this information is underway.

3.6.3 Area of Need submission and determination data

AoN submissions from employing health organisations throughout WA are approved by the Minister for Health, delegated to the Department's Chief Medical Officer. Data collected as part of the AoN determination process is maintained on file and in a central database which includes details of all expired and current AoN determinations in WA. This data provides the number of determinations in force (location and discipline); however, it does not indicate whether there is a doctor(s) working in that location. Further information on AoN can be found in section 7.3.

It should be noted that information and data regarding the IMG workforce is both problematic and fragmented. There is no tracking of IMGs from their initial employment on limited registration under supervision, through to their gaining general or specialist registration and their inclusion in Australian workforce data.

3.6.4 Australian Health Practitioner Regulation Agency database

The Australian Health Practitioner Regulation Agency (AHPRA) public online database is a detailed nationwide regulatory register of health professionals. AHPRA provides a health professional's formal name and unique registration number; their registration status, registration type and principal place of practice; and their professional qualifications, profession, specialty and subspecialty where applicable. While the AHPRA database is of high quality, a limitation is that medical consultants with multiple specialty qualifications may only provide the specialty discipline of their current employment, omitting their other specialty or sub-specialty discipline. The AHPRA database is a key primary data source for specialist workforce validations.

3.6.5 Headcount and full time equivalent data

Interpretation of headcount data and FTE data in medical workforce applications can lead to conflicting outcomes. When it is available, FTE data should always be preferred to headcount data; however, most medical workforce applications require consideration of both the private and public sectors and obtaining accurate FTE data from the private practice sector is difficult. Data quality is precise for public and private hospital data (headcount and FTE) but lacking in precision for the private practice sector.

[16] 2013 centralised process participants were Armadale Health Service, Fremantle Hospital and Health Service, Joondalup Health Campus, Rockingham General Hospital, Royal Perth Hospital, Sir Charles Gairdner Hospital, Swan Districts Hospital and the West Australian Country Health Service

3.6.6 Independent Hospital Pricing Authority patient classification codes and cost weights

Inpatient separations and mapping of diagnosis related groups (DRG) to medical specialties

Inpatient separation data is provided by the Department's Resourcing and Performance Division (RAP). Aggregated (non-episode level) separation data is provided for each Australian refined diagnosis related groups (AR-DRG) code. The quality of the data is dependent upon the quality of the patient discharge summary which is used by coders at hospital or health service level to assign the correct AR-DRG.

Specialties have been mapped to each AR-DRG code by MWB. Some AR-DRGs were mapped to one specialty but many were mapped against several specialties (especially core support service specialties such as anaesthesia, pain medicine, radiology and pathology), reflecting the multi-disciplinary treatment of patients assigned to that AR-DRG. For example the AR-DRG 'Y61Z Severe Burns" is most likely managed by a multi-disciplinary team in a dedicated unit. While the mapping should be considered reliable, it is possible that for some of those AR-DRGs containing multiple procedures not all specialties have been included.

Non-admitted (outpatient) occasions of service and mapping to Tier 2 code specialist clinics

Outpatient data is provided by RAP. Aggregated (non-episode level) occasions of service data is provided for each Tier 2 specialist outpatient clinic code. Specialties have been mapped to each Tier 2 code by MWB. This is a one-to-one mapping of Tier 2 specialist outpatient clinic code and specialty. Some multidisciplinary specialist clinics have been assigned to the "next best" Tier 2 specialist code. The quality of data is dependent upon data capture and inclusion: some outpatient data has not been captured and included. Outpatient data is not fully ascertained.

Emergency medicine episodes of care and mapping to urgency related group (URG) triage codes

Emergency medicine data is provided by RAP as a bi-product of routine mandatory reporting. Aggregated episodes of care data is provided for each URG triage code. Specialties have been mapped to each URG code by MWB. This is a simple one-to-one mapping of URG triage code and specialty. All activity data is assigned to emergency medicine. Quality of activity data is accurate.

Independent Hospital Pricing Authority (IHPA) determined national cost weights

National cost weights are calculated and published annually in advance for the patient type classification codes (AR-DRG, Tier 2 specialist outpatient clinic code and URG code). As the basis of the ABF/M modelling framework and funding entitlement, their use is mandatory. A fourth patient type, Australian national subacute and non-acute patient classification (AN-SNAP) will be utilised upon its' release.

All national cost weights are derived from large sample Australia-wide data. While each cost weight is likely to be near the true average, they are known to be subject to high variance. The weighted activity based (WAB) demand model developed by MWB is fully compatible with ABF/M. The IHPA derived cost weights are used to estimate aggregated weighted activity by medical specialty. Quality of cost weight data is not disclosed by IHPA.

3.6.7 Junior Doctor Business Case quarterly reports, 2013/14

JDBC funds are specific purpose funds approved by the WA Department of the Premier and Cabinet's Economic and Expenditure Reform Committee (EERC) for junior doctor training initiatives to 30 June 2015, in response to the COAG-approved incremental increase in medical graduate numbers in WA from 128 per annum in 2008 to 304 per annum in 2015. Funding through the JDBC has been allocated to the health services and provides for the establishment of new positions above baseline funding adjustments

(recurrent operational funding). Reporting of this data is required by the EERC. Further information on the JDBC can be found in section 7.4.

Quarterly reports summarising actual JDBC expenditure and the number of additional FTE employed, by hospital site, are provided to OCMO by all health services: Child and Adolescent Health Service (CAHS), North Metropolitan Health Service (NMHS), South Metropolitan Health Service (SMHS)[17], and WACHS. Data is collated and a comparison is undertaken between actual and planned figures. Health service figures are queried where there are apparent inconsistencies and any explanations are recorded. Some of the financial data provided to OCMO by health services in 2013/14 was not consistent with the data received by the Department's Health Finance and could not be reconciled.

3.6.8 Medical Training and Review Panel 17th Annual Report

Reliable data for intern and postgraduate year 2 (PGY2) annual commencements by college program and specialty/subspecialty is made available to the Australian Government's Medical Training Review Panel (MTRP). The MTRP provides detailed information concerning the training program course outline (basic and advanced), eligibility criteria, duration, and examination and assessment requirements. The data is used to estimate the number of new consultants expected during future years using an attrition adjustment.

3.6.9 WA Department of Planning population projections

Western Australia Tomorrow (2012) produced by the WA Department of Planning provides population projections in five series (2006 to 2026) referred to as "population bands". Each series was developed using different population growth assumptions. MWB employs the median projection series (Band C), as the minimal risk option, for all analyses. Population data is available in five year age and sex specific groups rounded to the nearest 100.

3.6.10 WA Health payroll data

Payroll data extracts (non-financial information) were obtained from the Department's Workforce Modelling and Data. As the data was not of sufficient quality for workforce planning purposes, it was used as a secondary data source for the validation of consultants. The main issues identified included: incorrect names in the data set; the use of multiple position titles for identical positions; and the allocation of some individuals to the incorrect specialty (confirmed by the individual). FTE and hospital code were found to be precise. Data pertaining to clinical academics (teaching commitments and sessional clinical practice) was sourced directly from the individuals concerned.

A lack of differentiation in the extract between basic and advanced vocational trainees and service registrars made validation challenging: numerous vocational trainees were reported as being held against service positions (both basic trainees and advanced trainees) and many senior registrar and fellow service positions were occupied by advanced trainees. The quality of the data is dependent on the accurate placement of the registrar against a position by the employing hospital or health service. Inconsistencies in the data implied a limited understanding of the difference between basic and advanced training status, and vocational training and service positions at the allocation stage. In addition, the placement of trainees on rotations was inconsistent, with some vocational trainees allocated to the wrong specialty i.e. that of the rotation, rather that the specialty in which they were training.

3.6.11 WA private hospital employee data

Listings of doctors providing services to private hospitals were sourced directly from the private hospital or from their website. The data was not of sufficient quality to be used as a primary data source (public or private).

[17] Prior to 2014/15, SMHS provided two sets of reports; one for Fremantle Group and one for Royal Perth Hospital Group.

3.6.12 Workplace-based Assessment

WBA is an alternative to the Australian Medical Council (AMC) clinical examination for IMGs. It enables IMGs on the standard pathway to undertake a program of assessments, supervision and feedback to fulfil the requirements for the AMC Certificate (allowing them to apply for general registration with the MBA) while providing additional benefits including assimilation into the Australian healthcare workforce, immediate feedback and regular mentoring. WA Health accepted 14 candidates into the WBA program in 2013. Further information on WBA can be found in section 7.2.

Candidate information and assessments are recorded in a central database and individual hard copy files are maintained by the WBA Senior Project Officer (SPO) within MWB. Assessment inaccuracies are followed up by the WBA SPO who contacts health services as required to ensure the documentation meets AMC guidelines. De-identified and collated candidate data informs reporting to the AMC and Australian Government, and statistical analysis of the data informs evaluation processes, as required. The database is updated and adjusted as required. The SPO reports to the International Medical Graduate Advisory Group on a quarterly basis and annual newsletters are published to the WA Health overseas doctor's website at www.overseasdoctors.health.wa.gov.au/doctors/wba.

4. Western Australia medical workforce profile

4.1 Medical graduates

Nationally, there is a focus on sustainability and 'growing our own' medical workforce[18]. In 2006, COAG announced it would fund 605 new places for domestic students in Australian medical schools, of which WA would receive 180 places (30%). As a consequence, the number of medical graduates in WA has steadily increased from 115 in 2005/06 to 255 in 2009/10, to a predicted 309 in 2015/16 and 353 in 2017/18[19].

The increase in the number of medical graduates has had a flow on effect on demand for prevocational and vocational training places, potentially displacing IMGs from some positions. In 2014, there was a reduction in the recruitment of IMGs to RMO positions.

As part of the COAG agreement, all states and territories committed to providing intern places for the additional domestic medical graduates. In WA, the additional prevocational training places for the Australian Government funded domestic medical graduates are provided for through the JDBC. This specific purpose funding program ceases in June 2015, and the additional funding will be incorporated into health service base funding from 2015/16 onwards. For further information refer to section 7.4.

Further increasing medical student numbers in WA has been suggested as a possible strategy to improve medical workforce self-sustainability in WA; however, further in-depth research and analysis is required, taking into consideration the medical needs of the community and the training capacity of WA Health.

4.2 Prevocational doctors

4.2.1 Interns

In 2014, 298 interns were recruited for the three primary employing health services; Fremantle Hospital and Health Service (FHHS), Royal Perth Hospital (RPH) and Sir Charles Gairdner Hospital (SCGH). A further 15 interns were recruited through the Commonwealth Medical Internship initiative at the Joondalup Health Campus (JHC). About 95% of interns were Australian citizens or permanent residents, the remaining five percent were Australian temporary residents.

A total of 298 PGY1s completed their internship and gained general registration with the MBA during 2014. Interns complete core terms as prescribed by AMC in medicine, surgery and emergency medical care. While the required core posts have been met for all interns to date, it is anticipated that it may become increasingly difficult to meet demand for these core posts as intern numbers increase.

4.2.2 Resident medical officers

Over 2,000 prevocational doctors across Australia and overseas applied for positions within the centralised RMO recruitment process in 2013 for positions commencing in 2014[20]. A total of 847 offers were made and 714 contracts were finalised and commenced. A majority of contracts were for 12 months (70%), followed by 6 months (14%) and 24 months (10%).

In 2014, 80.5% of RMOs were Australian citizens and permanent residents, with a small number of temporary residents (14.8%) and non-Australian residents (4.6%) making up the remainder.

The RMOs contracted were at various postgraduate year levels as shown in Figure 1.

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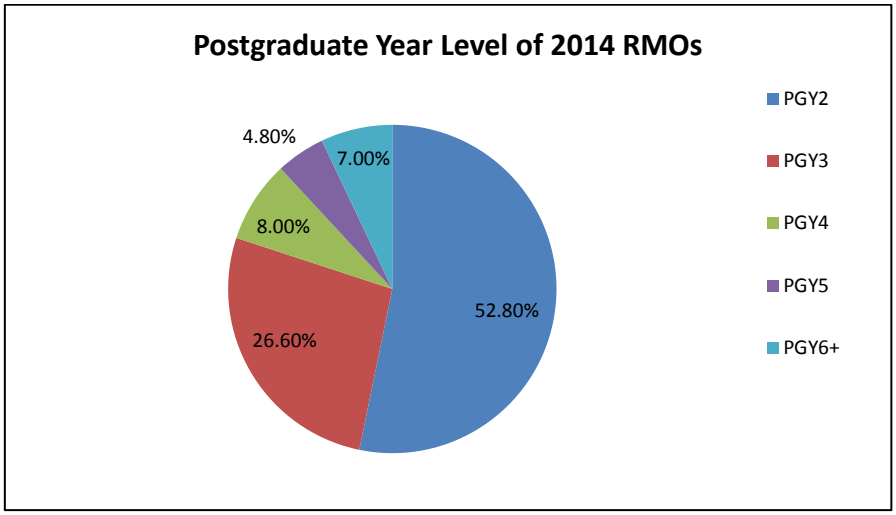
[18] Health Workforce Australia (2012), Health Workforce 2025, Volume 1, Australian Government.

[19] Provided by the PMCWA in November 2014.

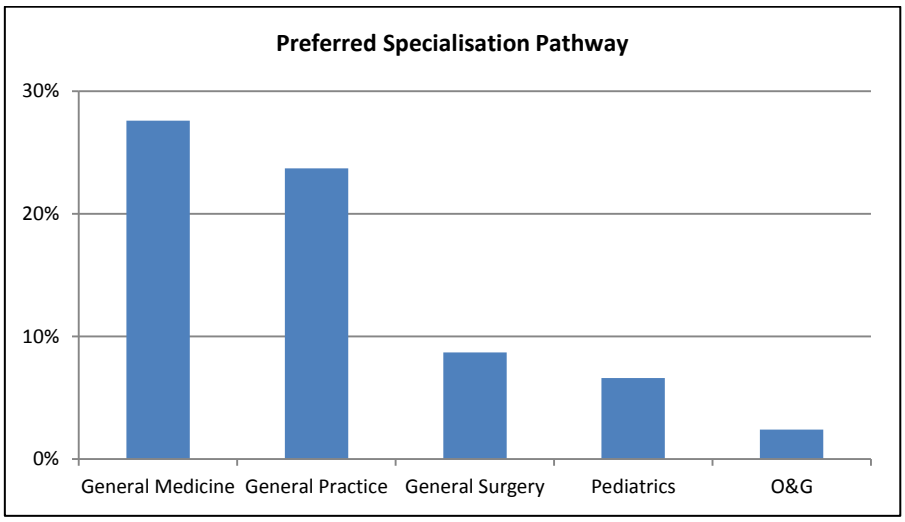
[20] Participants in the 2014 centralised process were Armadale Health Service, Fremantle Hospital and Health Service, Joondalup Health Campus, Rockingham General Hospital, Royal Perth Hospital, Sir Charles Gairdner Hospital, Swan Districts Hospital and the WA Country Health Service

Figure 1: Postgraduate year level of 2014 RMOs



RMO applicants were requested to declare their preferred specialty pathway. Over two thirds of contracted RMOs indicated a preferred specialty pathway, as illustrated in Figure 2.

Figure 2: Preferred specialisation pathway RMOs 2014 registrar workforce



4.3 Registrar workforce

Concerns about WA Health's capacity to accommodate the increasing numbers of junior doctors into vocational training positions prompted a more detailed investigation of registrar data for the SWCP 2013.

Registrar data for 2013 was sourced through WA Health payroll and compared it to AHPRA registrations. College vocational trainee numbers were taken into consideration as a data source; however, information was aggregated and it could not be validated against other data sources. In addition, there were a number of variances between vocational training programs that limited the usefulness of the data for SWCP purposes, including:

- some colleges include basic and advanced trainee numbers in their vocational trainee headcounts (e.g. the Australasian College of Emergency Medicine (ACEM)), while other colleges only include advanced trainee numbers (e.g. the Royal Australasian College of Physicians (RACP));
- some colleges accredit hospitals or health services (e.g. ACEM) and some colleges accredited individual positions or units (e.g. Royal Australasian College of Surgeons (RACS)); and

- some colleges have entrance exams for basic training (e.g. RACS, although this is changing from 2015), while some accept anyone occupying an RMO position as a basic trainee and have entrance exams to advanced training (e.g. RACP paediatric chapter).

The combined WA Health payroll and AHPRA lists of registrars were presented to the health services for review and clarification (i.e. validation of vocational trainees in advanced or basic training positions, specialty of training, IMGs, service registrars). The analysis confirmed that as at September 2013 there were 1,306 registrars on the public payroll, including approximately 600 in vocational training positions (the remainder were in non-vocational service positions) and 245 IMGs. Information on the number of registrars by specialty can be found in Appendix 1.

Upon investigation it was identified that the registrar workforce was not well understood in WA. This is compounded by the following issues:

- There is no central data collection point across specialties or health services.
- Registrars are allocated to position titles as training registrars, service registrars, senior registrars and fellows and there is no consistency between specialties and health services to the allocation of position titles.
- There is no consistent process of allocating a vocational trainee to a basic or advanced training position, and therefore no way of accurately identifying which vocational trainee is occupying a basic or advanced training position.
- There is no consistent process of identifying the occupant of a non-vocational service position (using currently available data).

Although the data capture methodology was improved for SWCP 2013, gaps remain and inconsistencies which have resulted in the development of the *Specialist Medical Workforce Profile Report* and consultation process (see page 39). The consultation process is underway and involves representatives from OCMO meeting with college representatives to investigate and validate the registrar data, and inform the eventual development of a registrar career pathway (see page 30).

4.4 Postgraduate Medical Council of WA data management project

PMCWA is undertaking a project to develop a longitudinal database for the management of interns, RMOs and registrars in WA. Data capture of intern and most RMO data is not a major concern, as this is managed by PMCWA through the centralised recruitment process. The critical issue is the capture of registrars in an accurate and consistent process.

As part of this project, the accuracy of data is being analysed. Visits were arranged with the main employing hospitals to gather information on how hospitals manage the data collection process and to identify possible benefits of a standardised data management system. A steering group is being established to progress this project.

Some of the main areas of concern relating to the collection of accurate registrar data include:

- There are different human resource (HR)/payroll systems between the health services and management and allocation of positions is different across each.
- Data management varies significantly across the hospitals/health services, and most have minimal data cleaning/maintenance protocols/processes in place or are in the early stages of developing them.
- Many hospitals use spreadsheets which are useful as long as they have set business rules; however, they do not longitudinally track data. Some hospitals/health services rely on Health Corporate Network (HCN) to keep registration data current while others maintain information such as registrations status/eligibility on a spreadsheet.
- Health services may not be adhering to the *Medical Positions Title Standard* accurately.

- Tracking the changeover from an RMO to a registrar position is not consistent across hospital sites and some HR systems are unable to manage this process requiring a new employee number to be allocated (and effectively 'losing' that doctor to the system).
- Registrar appointment to a position occurs through HCN. Some hospitals/health services have expressed concerns as to the overall accuracy and timeliness of the information processed by HCN[21], with most ensuring that they have their own subsequent verification processes in place (most hospitals track registrars on Excel spreadsheets).
- There are no automated links to other systems. There are manual links and search routines to AHPRA for verification of registration details, and to the WA credentialing database[22]. AHPRA updates are managed through batch processing on a monthly basis.
- There are no formal arrangements for sharing data outside of PMCWA. There are some ad-hoc requests from colleges but the majority of regular data requests come from PMCWA (rotations, resignations, intern assessments).
- There is no formally recognised process to track registrars once they complete vocational training (i.e. do they remain in the WA workforce or do they go interstate or overseas?).

4.5 Consultant workforce

In order to inform discussions about specialist workforce planning it was important to be able to identify and quantify, in combination with the registrar analysis program, the consultant workforce by specialty. There were also inconsistencies in this data.

For the SWCP 2013, information on the consultant workforce in WA was gathered from various sources and validated on an individual basis resulting in close to 100% accuracy. An audit was conducted with a representative sample of psychiatry, haematology, immunology and radiology specialties which indicated that the validation process was accurate. In these representative specialties, consultants were classified within the speciality they were working as opposed to the qualifications they held.

4.5.1 Western Australian consultant workforce in 2013

The SWCP 2013 consultant validation process identified a total of 2,662 consultants (across the 40 specialities recognised in 2013). This represents a consultant workforce increase of 12.3% since 2011. The addition of five newly recognised specialties in SWCP 2013 increased the total workforce numbers by a further 76 consultants (see Appendix 2), bringing the total number of consultants identified in WA in 2013 to 2,738.

Of the 475 new consultants identified in 2013 in specialties that had been included in SWCP 2011:

- 130 were missed from the SWCP 2011 validation process (which was based upon information provided by clinicians as part of a consultation process).
- 345 were new clinicians entering the consultant workforce.

In addition, there were 51 consultants who left the speciality assigned to them in 2011 and either entered into a new specialty or changed their primary specialty. Although these consultants are identified as 'losses' within the speciality they were assigned in 2011, they are not considered a loss to the overall consultant workforce as they have been counted against their 'new' specialty in 2013 (i.e. they are FTE neutral).

A total of 235 (9.9%) consultants departed the WA specialist workforce between 2011 and 2013. This included:

- 91 retirements.
- 60 migrations.

[21] There are concerns that the accuracy of the data entry is significantly impacted by the high turnover rate at HCN.

[22] The WACHS has its own credentialing database.

Further analysis on consultant departures (losses) for the medium or high volume specialties (with 30 or more consultants) can be found in Appendix 3.

To identify specialties in which future retirements and anomalies in age distribution are likely to significantly impact upon workforce planning, an age profile by speciality was conducted. An optimal consultant workforce has an age distribution that is smooth and positively skewed with a median age near 47or 48 years; however, the optimal distribution for individual specialties differs depending on the volume of the specialty workforce. Further information on optimal age distributions can be found in Appendix 4.

The analysis of the consultant workforce data indicated that overall the median age of surgical consultants was 48 years and the median age of non-surgical consultants was 50 years. Specific information for each of the specialties is located in the following Appendices:

- An age profile summary for each specialty, including median age, can be found in Appendix 5.
- A detailed analysis of the age distribution for each specialty, with implications for workforce planning, can be found in Appendix 6. The graphs have been colour coded depending upon the level of concern: green, there are no concerns, orange, some level of concern, red, serious concerns.

A number of specialties were identified as having a median consultant age above the optimal target range; these are shown below in Table 1.

Table 1: Specialities with above optimal median ages

Surgical specialities	Non-surgical specialities
Cardiothoracic Surgery ***(52 years)***	Clinical Pharmacology ***(60 years)***
Neurosurgery ***(51 years)***	Occupational & Environmental Health Medicine ***(60 years)***
General Surgery ***(50 years)***	Medical Administration ***(58 years)***
	Addiction Medicine ***(55 years)***
	Neurology ***(53 years)***
	Haematology ***(52 years)***
	Rehabilitation Medicine ***(52 years)***

The median age of surgical and non-surgical consultant retirement for 2011-2013 was 58 and 67 years respectively. The difference in retirement age is statistically significant ($p<0.001$). (Refer to 'Adjust the retirement age for the surgical specialties and emergency medicine from 65 years to 60 years' on page 46 for proposed adjustments for retirement age for SWCP 2015.)

4.5.2 Public and private health sectors

The SWCP 2013 consultant data set was used to determine the number of persons employed wholly within the public sector, wholly within the private sector and consultants who provided services across both public and private sectors by medical specialty. The data was divided into a percentage public and a percentage private by assuming that consultants who worked in both sectors spent an equivalent time in each sector (see

Table 2). Subsequent analysis confirmed this assumption was correct.

Table 2: Analysis of public and private sector employment by percentage

Sector	Number
Public Sector	62.9%
Private Sector	37.1%

A summary of the distribution across the sectors is shown in Table 3. For information by specialty see Appendix 7.

Table 3: Analysis of public and private sector by head count

Sector	Number
Public Only	1283
Private Only	575
Combination Private & Public	881

The following conclusions have been drawn from this data:

- A high proportion of consultants work in both public and private sectors due to sessional contract employment.
- Sessional contract positions are most common for consultants who work wholly within the public or private sector.
- A minority of consultants are employed in a single full-time position.
- Most surgical consultants continue to work mainly in the private sector, especially if they have operating theatre access in a public or private hospital.

4.5.3 Rural areas

There are many specialties that are not represented or are under-represented in rural and remote areas of WA. Specialist services in rural and remote locations[23], as well as some outer-metropolitan hospitals, are often provided by VMPs; with additional services, including emergency evacuation, specialist clinics and a rural women's GP service, provided by the Royal Flying Doctor Service Western Operations[24] as required and/or available.

An analysis of the SWCP 2013 data indicated that: 92% (n=2,527) of consultants provided services in metropolitan areas only, as the large public teaching hospitals have the necessary resources to cater for the unique infrastructure needed in many of these specialties; 7% (n=179) of consultants provided services in rural locations only; and 1% (n=32) of consultants provided services across both rural and metropolitan locations. The data on rural service provision in 2013 is likely to be an underestimate as identified data on VMPs was not available for the purpose of this report.

While some fields of medicine are highly specialised and cannot be delivered in non-metropolitan locations for practical reasons, WA does have a number of initiatives in place to assist with delivery of those services that can be provided in rural and remote communities including generalists (GP training[25] and general physicians[26], GP proceduralists/non-proceduralists)[27] and specialist outreach services[28].

[23] http://www.wacountry.health.wa.gov.au/index.php?id=mca

[24] http://healthprofessionals.flyingdoctor.org.au/primary-health-care/western-operations/

[25] http://wagpet.com.au/applicants/interested-in-agpt

[26] General Medicine was investigated in detail in 2013-14 and shown to be about 3.5 FTE consultants short in the regional centres. OCMO is undertaking a General Medicine project aimed at increasing the distribution and number of generalists in WA (see page 39)

[27] http://wagpet.com.au/registrars/specialised-rural-and-procedural-training

[28] http://www.ruralhealthwest.com.au/outreach-services/programs

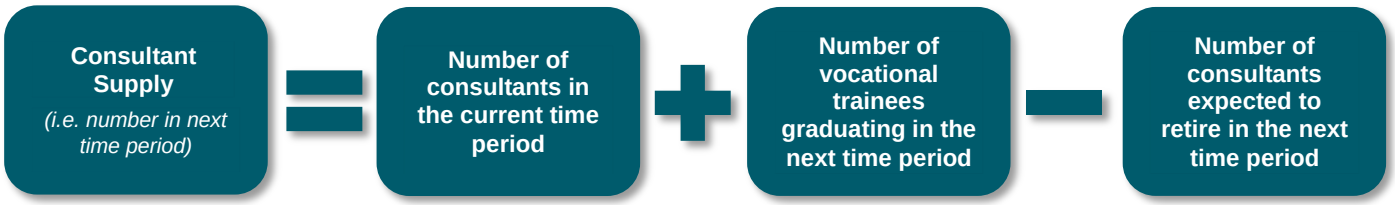
5. WA consultant workforce analysis

The purpose of this analysis is to estimate current and projected demand of consultants by specialty and provide risk assessments of anticipated shortfalls. This is achieved using estimates from SWCP 2013 for supply and demand; and 2011-2014 activity data for projections of demand.

5.1 Projected supply model

The following 'stock and flow model' shown in Figure 3 is used to estimate consultant supply.

Figure 3: Estimated consultant supply model



5.1.1 Assumptions of the supply model

Consultant numbers:

- The SWCP 2013 consultants' validation results are accurate.
- Head count numbers are used (not FTE).
- The age of retirement is 65 years for all consultants.
- Consultant resignations are filled by an alternative appointment.
- A consultant is counted within a specialty if they are working "as a consultant" in that speciality area, regardless of their qualifications.
- IMGs are included in consultant estimates but excluded from projections.
- For projections, net migration (from interstate and overseas) is assumed to be zero.

Vocational trainee numbers:

- Numbers are for vocational trainee registrars only (non-vocational service registrars are excluded).
- Vocational training program length is the minimum time required to complete specialist training.
- The program length for training programs is mostly for advanced trainees only.
- Trainee throughput rate is the expected number of trainees successfully completing the training program per annum fixed at 2013 rates.
- An attrition rate of 30%[29] has been assumed for all non-RACP specialties. RACP advanced trainees where allocated an attrition rate of 7.5% due to the shortness of the program as trainees participate in basic training prior to entering the program. The RACS attrition rate is expected to decrease with changes to the vocational training program commencing from 2015.
- Trainees who study in WA will be employed as a consultant in WA.
- The percentage growth figure used for health service delivery based demand will be 3.6% per annum (based on 2013 growth being 3.6% and growth over the last three decades being between 3% and 4% per annum).

[29] Commonwealth of Australia (2014), Medical Training Review Panel: Seventeenth Report. Accessed from: http://www.health.gov.au/internet/publications/publishing.nsf/Content/work-pubs-mtrp-17-toc

5.2 WA consultant workforce supply

Using the supply model described above in 5.1, projections of consultant supply in 2016 and 2021 were developed for each specialty. The results by specialty can be found in Appendix 9.

Between 2013 and 2021, 646 retirements and 997 trainees contribute to the projected overall supply of 3,090 consultants in WA in 2021. Table 4 shows the total projected supply over time.

Table 4: Projected supply over time for WA specialist workforce (all specialties)

Year	Plus Trainees	Less Retirees	Projected Supply
2013	-	-	2738
2016	375	362	2752
2021	997	646	3090*

NB: Supply estimates in tables have been rounded to the nearest integer which may result in rounding errors in total consultant numbers.

5.3 Projected demand model

The WAB demand model was developed by MWB for SWCP 2013 to address the limitations inherent in alternative demand models, and provide precise estimates of consultant service delivery demand by speciality compatible with the ABF/M framework.

Further information on the WAB demand model can be found in Appendix 10.

5.4 Supply, demand and risk assessments

The supply and demand models were applied to each specialty. The results are illustrated in time series graphics of supply and demand from 2013, by specialty, which are provided in Appendix 11.

With projected levels of supply and demand established for each specialty, shortfalls were estimated and a standardised risk assessment tool was applied to ascertain the level of risk associated with the various shortfalls. Further information on the risk assessment tool and criterion can be found in Appendix 12.

A table of the completed demand, shortfall and risk assessments for 2016 and 2021, by specialty, can be found in Appendix 13.

For the purposes of the MW Report, aggregate figures have been provided that show the overall levels of shortfall/excess in the WA specialist workforce; however, it is important to note that the supply and demand models described in 5.1 and 5.3 were designed to analyse workforce numbers by each specialty, not total consultant numbers. It should be noted that:

- Any aggregated or overall figures must be reviewed with caution due to rounding errors and the presence of an over or under supply in various specialties.
- A specialty workforce in excess does not add value to the specialities in shortfall or the consultant workforce as a whole, and these excess specialities incorrectly mask the shortfall of others.

Detailed analysis at specialty level can be found in the Appendices as referenced throughout the report.

As can be seen in Table 5, the net shortfall of aggregated supply and demand in 2013 was 55 consultants. This comprised a shortfall of 218 consultants in some specialties and an excess of 163 in the remaining specialities. According to the data, 571 consultants will need to be sourced during the intervening years to meet WA's health service needs by 2021; through the revision of vocational training priorities and the provision of funded posts in WA, or by interstate or overseas recruitment.

Table 5: Specialist demand with shortfall/excess for WA specialist workforce (aggregate)

Year	Supply	Demand	Under Supply	Over Supply	Net Shortfall
2013	2738	2794	218	163	55
2016	2752	3087	454	119	335
2021	3090	3661	755	184	571

Although the net shortfall figures should be viewed with caution, when the under supply and over supply figures are considered, there appears to be opportunities to convert oversupply in some specialties to address undersupply in the remaining specialties without significant added costs.

An analysis of the risk associated with each speciality shortfall was conducted illustrating a low, medium, high or critical risk (refer to Appendix 12). There is an increase in risk over time for most specialties as shown in the table below.

Table 6: Risk assessment for WA specialist workforce (all specialties)

Year	Low	Medium	High	Critical
2013	24	11	7	3
2016	18	6	12	9
2021	13	5	8	19

5.5 Vocational trainee throughput time series analysis

The vocational trainee throughput modelling framework has enabled a time series analysis of each specialty, showing the difference in trainee supply and demand on an annual basis from 2014 to 2021. Appendix 14 provides for each specialty: the excess/shortfall from 2013; the level of increase in growth in service based demand; and an indication of whether retirement based demand and growth in service based demand is addressed by the vocational trainee throughput.

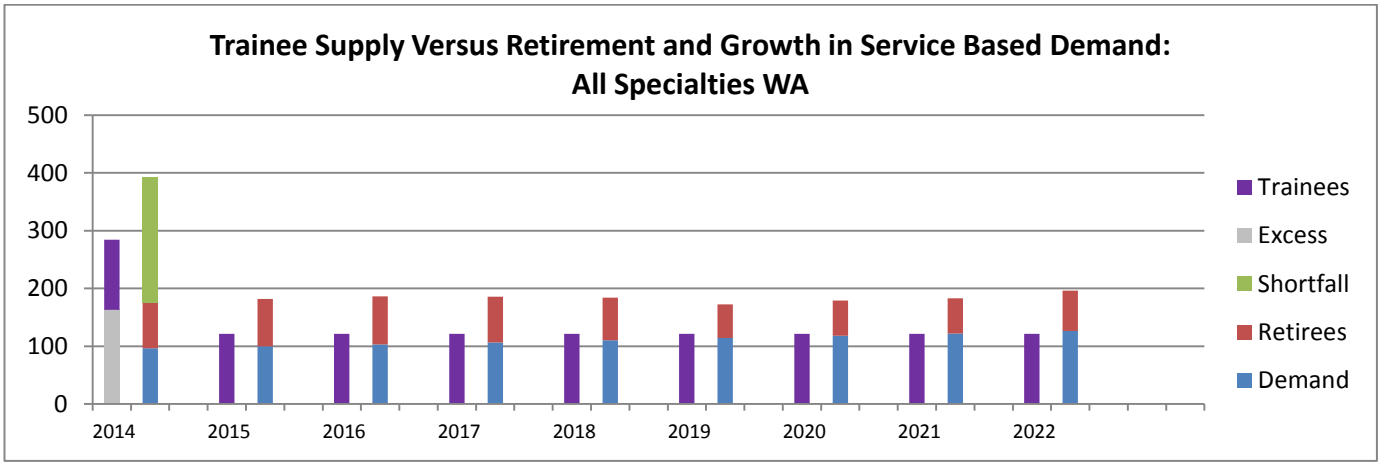
It should be noted that to remove the distortion in the series caused by persons aged greater than 65 years during 2013, it was assumed that this cohort would retire within the next 5 years with equal probability of retirement in each year; and the assumptions above are slightly biased toward the most favourable outcome for WA.

Figure 4 provides an example for the overall specialist workforce, based on the following aggregated figures:

- An average of 124.8 vocational trainees would complete their training per annum.
- About 82 consultants would retire per annum.
- Growth in service delivery based demand increases from 96.3 to 126.5 consultants during the period.

Please note that in Figure 4, the first column in each year represents supply (trainees) and the second column represents demand, split into retirement based demand (red) and service based demand (blue). The year 2014 only contains the accumulated excess (black) and shortfall (green) of consultants in a subset of specialties over time.

Figure 4: Trainee supply versus retirement and growth in service based demand (all specialties)



The key findings below are based on an analysis of aggregate data and the 'by specialty' analysis included in Appendix 14:

- Both consultant numbers (excess and shortfall) are high when compared to the total workforce and imply the vocational trainee throughput mix has not been adequately reviewed or addressed for a considerable length of time.
- Most of the excess is in the private practice dominated specialties and most of the shortfall (exceptions being ophthalmology and obstetrics and gynaecology) is in the hospital dominant specialties.
- There is at least an 8% shortfall in the 2013 WA consultant workforce with the shortfall > 8% in the hospital setting (public and private).
- Any increase in vocational training numbers in any speciality, commencing in 2015 will have minimal impact by 2021, as few of these trainees would complete the program to become consultants by 2021. Increasing vocational numbers to address workforce shortages in specialties currently in shortage would require development of a medium to long term strategy.

In summary, for most specialties vocational trainee throughput is insufficient to keep pace with growth in service delivery demand. For many specialties the number of vocational trainees expected to finish the training program is insufficient to replace retirements during the period to 2021. Strategies will be required to ensure that the appropriate number of additional consultants is available to meet demand.

5.6 Private sector supply, demand and risk assessment

Private sector consultant supply, demand and shortfall estimates were analysed and risk assessments undertaken. The analysis can be found, by specialty, in Appendices 15, 16 and 17.

The private sector net shortfall of aggregated supply and demand was 6 in 2013. This comprised an excess of 72 consultants in a subset of specialties and a shortfall of 78 in the remaining specialties. Table 7 provides a summary of changes in risk assessment for all specialities within the private sector over time.

Table 7: Risk assessment for WA private health sector workforce

Year	Low	Medium	High	Critical
2013	27	8	5	2
2016	18	4	10	9
2021	12	4	5	20

5.7 Public health sector supply, demand and risk assessment

Supply, demand and shortfall by specialty for the public health sector were also analysed by specialty. A summary table can be found in Appendix 18. An analysis of the results indicates that for many specialties the public sector shortfalls are significantly different from shortfall estimates derived for public and private combined. This is most notable in the surgical specialties.

The net shortfall between aggregated supply and demand for 2013 was 31. This comprised a shortage of 125 in a subset of specialties and an excess of 94 in the remaining specialties. Table 8 shows the changes in supply, demand and shortfall over time.

Table 8: Specialist demand with shortfall / excess for WA public health sector

Year	Supply	Demand	Under Supply	Excess	Net Shortfall
2013	1712	1723	125	94	31
2016	1728	1930	273	71	202
2021	1954	2291	452	115	337

As previously discussed the net shortfall column across aggregate consultant numbers in the public sector must be viewed with caution as it masks the large shortfalls evident in some specialities.

The associated risk assessment of shortfall, by specialty, can be found in Appendix 19. Specialties with current shortfalls and those with a large volume of expected retirements will rapidly approach high risk and critical risk levels. The earlier these shortfalls are addressed, the better the long term outcome. Table 9 includes a summary of the overall increase in risk assessment for all specialties in the public sector. As can be seen from the table, there is an increase in the number of specialities that will have a critical risk over time.

Table 9: Risk assessment for WA public health sector workforce

Year	Low	Medium	High	Critical
2013	25	11	5	3
2016	18	6	11	9
2021	13	6	6	19

It should be noted that there is a difference in the projected demand figures for general medicine between the SWCP 2013 WAB demand model and the demand model used as part of GMWP. The SWCP 2013 WAB demand model uses activity data from ABF/M, and has been determined to be the most appropriate methodology across the spectrum of the varying specialties in WA.

It is acknowledged that the generalist workforce is under-represented in the rural, remote and outer metropolitan locations of WA. An increase in generalist workforce numbers is required to meet this unmet demand to increase opportunities for dual training (e.g. general medicine and gastroenterology) in rural, remote and outer metropolitan hospitals.

5.8 Funding the required public sector positions

A final analysis was undertaken to determine the number of public sector funded positions required to meet demand in 2021 given the shortfall in 2013 (ignoring any excess) and it was identified that an additional 595 funded consultant positions would be required (see Appendix 20). This was equivalent to about 75 FTE positions per annum for eight years commencing in 2014; however, because over 20% of the 2021 shortfall is the pre-existing shortfall from 2013 (n=125) and 2014 is virtually complete, the target has been revised to 85 FTE positions per annum for seven years commencing in 2015.

Approximately 86.25 FTE new public sector consultant positions per annum were created during the SWCP period (2011-2013). A simulated scenario has been developed and tested, which demonstrates that; should 85 FTE funded consultant positions per annum (2015 to 2021 inclusive) already incorporated into the WA Health budget be utilised to target key specialities, the risk of critical and high risk shortfalls for 2021 could be eliminated by end 2017. Additionally, all 2021 shortfalls could be reduced to a low or no risk assessment by end 2021 (refer to Appendix 21). This concept is further described in the OCAM section of this report

Implementation of OCAM would require a whole of health planning framework for the specialist workforce, prioritising specialties with critical to high shortages, in consultation with health services. The main challenge of implementing any health reform strategy to address workforce shortages without increased funding, is addressing the embedded recruitment and employment practices at health service level which do not reflect whole of health needs.

6. WA medical workforce performance measures

MWB has utilised the performance indicator framework developed as part of COAG's Review of Government Services to assist in analysing the performance of WA specialist workforce planning to date. The framework focuses on outputs grouped under the following headings:

1. **Equity:** Equitable access to health care for all, including special needs groups.
2. **Effectiveness:**
   - Timely and affordable access;
   - Appropriateness of meeting clients' needs; and
   - Quality.
3. **Efficiency:** Provision of quality goods and services (healthcare) at minimal cost, with access to innovative healthcare as it becomes available.

6.1 Equity

Equity in health refers to how well WA Health is meeting the needs of the community, including access to healthcare for those that have special needs or access difficulties. The main focus is on demand. It should be noted that although WA still has one of the lowest medical practitioner to population ratios in Australia; no 'ideal' figure has been established, and increases in the ratio of medical practitioners to population over the past decade in WA demonstrate that initiatives to increase supply in order to meet demand are having some effect.

6.1.1 Geographic distribution

It is known that the more remote the area, the more serious the medical workforce shortage, and the less access there is to appropriate healthcare in these communities; however, in WA there are also concerns about equitable distribution of medical services in the outer metropolitan and metropolitan areas.

Socioeconomically disadvantaged groups have the poorest health according to morbidity and mortality rates and measures of illness[30]. There is significantly better access to healthcare in wealthier areas but health care needs are greatest in poorer locations ('inverse care law')[31]. People with mental illness, those who are socially marginalised, people with disabilities and their families, and communities in rural, remote and outer metropolitan areas can find it difficult to access care when it is needed.

A study featured in the September 2010 issue of Health Affairs[32] found that emergency departments are being utilised inappropriately by many people seeking care for ailments that are not emergencies. This could be attributed, in part, to a lack of access to primary care services. In WA, a shortage of GPs[33] and a maldistribution of generalist services in rural and remote locations may be exacerbating this issue.

Key findings

- Rural, remote and outer metropolitan communities find it difficult to access some specialist services.
- Disadvantaged groups are less likely to have their healthcare needs met.
- From an employment perspective; rural, remote and outer metropolitan areas do not have the same appeal as metropolitan Perth.

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[30] http://www.health.gov.au/internet/nhhrc/publishing.nsf/Content/504AD1E61C23F15ECA2574430000E2B4/$File/BeyondTheBlameGame.pdf

[31] According to the Inverse Care Law, the availability of good medical or social care tends to vary inversely with the need of the population served.

[32] Pitts, S.R., et al. Where Americans get acute care: Increasingly, it's not at their Doctor's office. *Health Affairs*. September 2010.

[33] Duckett, S. Breadon, P. (2013) Access all areas New solutions for GP shortages in rural Australia. Grattan Institute. Access from http://grattan.edu.au/report/access-all-areas-new-solutions-for-gp-shortages-in-rural-australia/

Proposed strategies

- Address maldistribution in rural, remote and outer metropolitan areas:
  - Investigate and identify recruitment and retention challenges in the rural, remote and outer metropolitan areas.
  - Improve early career exposure to rural, remote and outer metropolitan areas.
  - Support increased generalist training pathways.
- Explore opportunities to strengthen incentives for the specialist workforce (e.g. models of employment, continuing professional development, research opportunities, access to sabbaticals and development of career pathways)

6.2 Effectiveness

The main focus within effectiveness for the medical workforce in WA is ensuring the supply is appropriate, such as:

- The right medical practitioner is treating the right patient at the right time, and there is minimal over or under servicing.
- Quality output from medical schools, pre-vocational training programs and vocational registrar training.

6.2.1 Distribution of the specialist workforce

WA Health medical workforce structure and practices

Historically, health services in WA have been responsible for management of their own workforce planning. There has traditionally been a lack of leadership and coordination, not only between health services, but also across colleges and private health service providers resulting in isolated 'silos' in some specialties.

Some inroads have been made in this area with the centralised RMO recruitment process assisting with coordination of junior doctor employment, and private health provider 'roundtables' and other stakeholder discussion forums providing expert feedback and advice. The MWB forums that report to the Director General of the Department through the Medical and Dental Workforce Council include the International Medical Graduate Advisory Group and the Clinical Vocational Reference Group. These forums provide avenues for consultation with key stakeholders and support the Department in leading coordinated workforce planning to address issues impacting on the medical workforce (i.e. barriers to workforce reform).

Vocational preference of medical graduates

Many interns may have career aspirations for their preferred specialist vocation well before the commencement of PGY1[34]. For others, PGY1 and PGY2-3 provide an opportunity to consolidate skills and rotate through a range of specialties. Vocational preference is a trainee's prerogative and may not match employer expectation or demand for health service delivery, but it can have a significant impact on workforce supply.

Understanding doctors' preferences about specialty choice is of vital importance to ensuring that the numbers of medical practitioners trained in various specialties match demand for medical services. HWA's *Health Workforce 2025* predicted a mismatch between the demand for vocational training places and their availability, as well as a lack of available consultant positions to meet demand in some specialties. Information on the specialist workforce in WA demonstrates that some specialties are more

[34] Around 15 per cent of medical students report being certain of their specialty at the end of medical school. MABEL https://mabel.org.au/downloads/PolicyBriefs/PolicyBrief_Issue2_2014.pdf

popular than others, resulting in an imbalance across specialties. Funding for healthcare is finite, and with the significant competition for vocational training positions due to increased numbers of junior doctors, there may no longer be the same opportunity to be accepted into a training program of first choice.

Structure and administration of specialist training

Each college has its own training program and requirements dependent on the type of clinical medical practice, with availability of places limited by accreditation and funding. There are also differences in the way specialty training programs are administered and whether colleges accredit training 'positions' or a training 'location' differs across specialty. Vocational training positions are funded by state health departments. Specialty training programs can take from three to seven years, or longer for part-time trainees. Once specific assessment requirements are met, within a defined minimum length of training, the trainee is eligible for fellowship and to apply for a consultant position.

Medical workforce planning can influence outcomes through consideration of career structure including the structure and length of training, and the structure of promotion and rewards at different career stages. There is currently little coordination across colleges and no overarching coordination across the state resulting in a workforce that:

- Does not necessarily meet the healthcare needs of the community;
- Leads to longer vocational training times; and
- Creates uncertainty among the emerging medical workforce about specialty career pathways.

Trend toward subspecialisation

For several decades there has been a strong trend away from generalist practice towards subspecialisation, led to some degree by increasing complexities in the hospital casemix. While a mix of specialists and sub-specialists, from a hospital viewpoint, will cover a greater range of medical conditions and patient presentations than a generalist workforce, this model is not feasible for effective care especially in rural and remote centres. The subspecialisation of the medical workforce has implications for various aspects of healthcare delivery including the quality of care, cost of care, and sustainability of services in rural and remote areas.

There has been a more recent trend back toward generalists, and the understanding of the importance of generalist specialities particularly in general medicine, general surgery and to a lesser extent general paediatrics. Creating generalist positions in outer metropolitan, rural and remote areas has been shown to improve sustainability and accessibility of healthcare, as the majority of patients presenting with common conditions and illnesses, without comorbidity or complication.

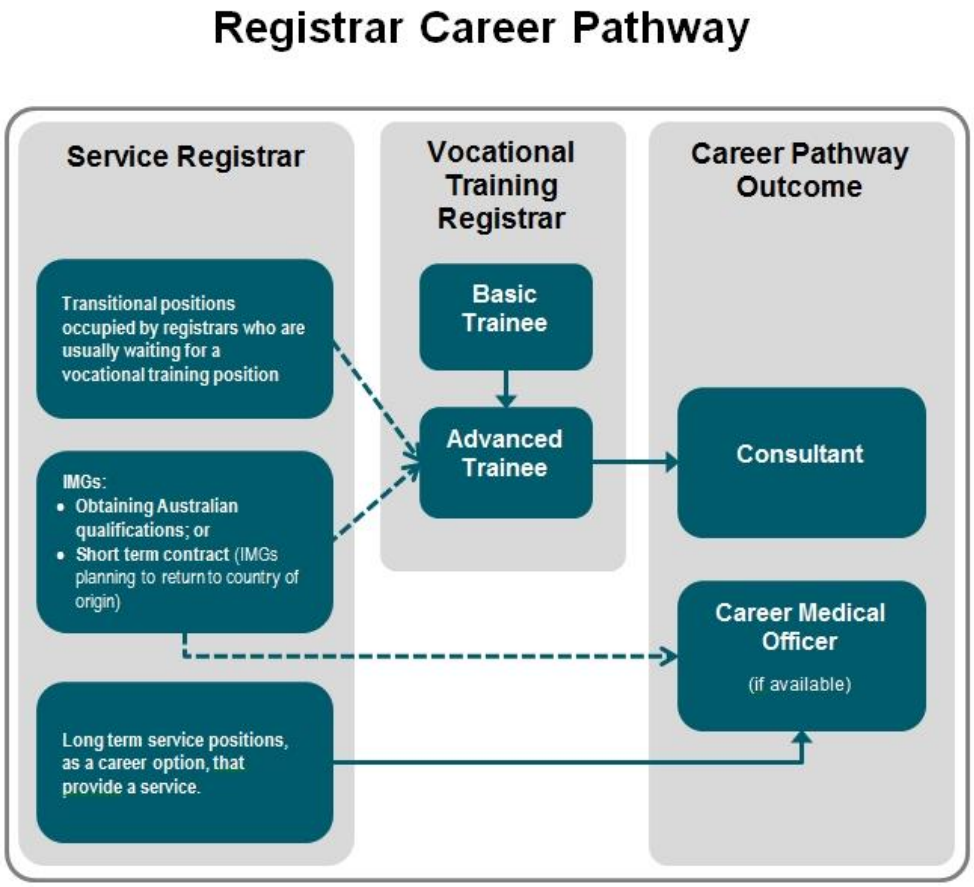
6.2.2 Registrars: Service versus vocational trainees

The increasing number of medical school graduates entering the WA health system is expected to peak at 353 in 2017/18[35]. Medical school graduates generally either enter primary care training (i.e. general practice) or, if they remain in the hospital-system, follow a typical specialist training pathway; progressing from prevocational training (intern then RMO), to vocational training (registrar), to eventual qualification as a specialist (consultant).

The increase in medical graduate numbers has resulted in a concomitant increase in funded positions for interns and RMOs; however, there has not been the same increase in funded vocational training positions, resulting in increased competition. As a result, a greater number of junior doctors are remaining in either an RMO position, or a non-vocational service registrar position. The challenge for medical workforce planners will be to develop suitable career pathways, such as the registrar career pathway illustrated in Figure 5.

[35] Figure provided by PMCWA in November 2014.

Figure 5: Registrar career pathway



Service registrars provide a valuable service contribution supporting consultants, especially in some clinical areas such as surgery and emergency medicine, and provide supervision for doctors in more junior roles. Service registrars generally include three separate categories:

1. **Transition to training**
    - Occupied by registrars with general registration gaining experience while waiting to secure a vocational training position.
2. **IMGs**
    - Progressing towards Australian qualifications through AHPRA.
    - On short term contracts with limited registration (planning to return to country of origin).
3. **Long term non-vocational service positions**
    - Provide a service with no training requirement.

The third category of service registrars (non-vocational) is made up of medical practitioners who are no longer on the specialist training pathway, i.e. for whatever reason, they are committed to a service role and will not be undertaking vocational training. The number and distribution of these individuals varies across the health services, with the number anticipated to increase as there is competition for vocational training positions.

This non-vocational registrar workforce will be reviewed and consideration will be given to the development of either; conversion to training placement, or progression to a formalised and defined career pathway to maintain and enhance their skills. Options include the development of a career medical officer, or hospitalist pathway. Leadership training could also be introduced separately to this program to enhance skills in all vocational training groups.

The development of a non-vocational training program to support these pathways would require development of a framework defining accreditation requirements and quality control.

NSW Health offers a hospitalist career pathway, which could be reviewed by WA Health as part of the development of a structured career pathway for service registrars. The Masters of Clinical Medicine (Leadership and Management) [36] is offered co-jointly with NSW Health and the University of Newcastle. This pathway sits between the specialist training pathway and the GP training pathway, and is specifically designed to provide a new career pathway for hospitalists with a focus on the 'generalist' perspective. The pathway fast tracks eligible NSW Health medical practitioners to the senior hospitalist role, with graduates able to apply for Senior Hospitalist positions (Senior Career Medical Officer grade equivalent) after five years of postgraduate experience rather than seven.

6.2.3 Vocational training models

Education and training of the medical workforce is shared between the Australian Government (universities) and states, colleges and other professional bodies. The whole health system plays a role in training specialists which typically takes between 12 to 17 years, or longer; from undergraduate training through university to prevocational and vocational training.

Vocational training is the training that is required to prepare a medical practitioner to work in a chosen specialty as a fellow of one of the recognised colleges. Medical practitioners who undergo this training are known as vocational training registrars.

Traditionally, vocational training and supervision has been undertaken in the tertiary hospital sector (public) with limited exposure to private and rural and remote settings, except for general practice where most of the training is undertaken in private community-based settings; however, there is limited capacity to train in traditional settings and recurring issues raised by clinicians include the lack of protected time in the tertiary environment for research, teaching and training.

While there is a need to further investigate alternative models of vocational training, there are barriers that need to be addressed when considering training in a non-tertiary setting including:

- time and workforce constraints in the private sector; and
- insufficient numbers of qualified clinicians to provide supervision in outer-metropolitan and rural and remote locations.

Collaboration between stakeholders is occurring to develop strategies that will support expansion of vocational training opportunities for the increasing numbers of junior doctors while minimising the impact on these sectors. Some strategies that are being considered include:

- creating training opportunities in largely private-based surgical specialties; and
- introducing alternative models of supervision for specialties with shortages in rural and remote areas that would normally require two on-site supervisors.

Increased feminisation of the workforce and the changing needs of the medical workforce must also be taken into consideration when reviewing traditional vocational training models. In the United Kingdom a Less Than Full Time Training (LTFT) scheme[37] has been introduced and is available to men and women who have well-founded reasons to prevent them from working full-time such as:

- disability or ill health (this may include those on in-vitro fertility programmes);
- responsibility for caring for children (men and women), particularly maternity leave (for information on the feminisation of the medical workforce, please refer to Appendix 22);
- responsibility for caring for an ill and/or disabled partner, relative or other dependant;

[36] http://www.health.nsw.gov.au/training/hospitalist/Documents/Master-of-Clinical-Medicine-Brochure.pdf

[37] http://www.medicalwomensfederation.org.uk/advice-support/less-than-full-time-training

- unique opportunities for their own personal and /or professional development, e.g. training for national and/or international sporting events, or short-term extraordinary responsibility, e.g. a national committee;
- religious commitment, involving training for a particular religious role which requires a specific amount of time commitment; and
- non-medical professional development such as management courses, law courses, fine arts courses or diploma in complementary therapies.

LTFT is defined by European law as part-time training that involves a limitation in participation in medical activities. Trainees must work at least half the time of a full-time trainee, and the LTFT can be undertaken at any stage during training[38]. Further discussion on LTFT will be undertaken by MWB with relevant stakeholders.

6.2.4 Reliance on international medical graduates

There are many IMGs employed within the specialist workforce in WA, from junior doctors to consultants. Between 2001 and 2011 the proportion of medical practitioners born overseas, who were recent arrivals in the preceding five years, increased from 12% for GPs and 15% for specialists to19% for both.[39]

National changes to the registration of IMGs since 2010[40] have also had an impact, with the MBA mandating that all IMGs must progress towards general or specialist registration within a four year time period or they will cease to be eligible for registration in Australia. Despite the increasing number of Australian-trained doctors entering the workforce, rural and remote locations in WA are still reliant on IMGs to fill GP and some specialist positions. A number of specialties have been identified at a national level as being highly reliant on IMGs across all locations and states and territories, including general practice, obstetrics and gynaecology, ophthalmology, psychiatry and radiology[41].

While filling a vacancy quickly is beneficial, the value and productivity of an IMG can be limited if appropriate orientation and support to assimilate into the Australian healthcare setting is not provided. The *Lost in the Labyrinth*[42] report clearly identifies the importance of providing adequate support mechanisms for IMGs to encourage recruitment and retention.

6.2.5 Retirement of medical practitioners

Many medical practitioners are approaching retirement age. About 25% of the 2013 consultant workforce is expected to be retired by 2021, and in some moderate and small volume specialties, the retirement percentage is anticipated as being closer to 50%. Retirement of medical practitioners is expected to have a significant impact on the supply of health services over the next decade.

Given the ageing of the workforce, and reduction in work hours from both genders, the evidence is that the increased training, graduation and recruitment of health workers will in many locations lead only to a small net increase in the number of FTE practitioners. The rural and remote workforce tend to retire earlier than their metropolitan peers, impacting both on sustainable healthcare, and the training, supervision and support of medical students, prevocational trainees and vocational trainees in these areas.

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[38] http://www.gmc-uk.org/Less_than_full_time_training___GMC_position_statement___18_October_2011.pdf_45023470.pdf

[39] ABS 4102.2 Australian Social Trends, Doctors and Nurses, April 2013. Accessed on 27 October 2014 at: http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4102.0Main+Features20April+2013

[40] Health Practitioner Regulation National Law Act 2009

[41] Health Workforce Australia (2013). National Rural and Remote Workforce Innovation and Reform Strategy.

[42] House of Representatives Standing Committee on Health and Ageing (2012). Lost in the Labyrinth Report on the inquiry into registration processes and support for overseas trained doctors. The Parliament of the Commonwealth of Australia.

6.2.6 Migration interstate and overseas

There is an increasing trend in some specialties for new consultants to move to the eastern states or overseas due to a perceived lack of employment opportunities in WA. Some new consultants are working as service registrars (senior) or fellows while they wait for consultant positions to become available, or are splitting their time between part-time FTE in the public and private sector. For newly trained consultants establishing a foothold in the private sector can be difficult. Limited or no training exposure in this sector could be due to the lack of support networks in place. In non-procedural specialties it can also be very difficult to make sufficient income from solely working in private practice, and being attached to a public hospital can be beneficial professionally and financially.

While the current Australian Medical Association award for medical practitioners makes allowance for professional development, often the reality is that there are not enough consultants or registrars to provide sufficient leave cover, requiring IMGs to be employed on short-term contracts. In rural and remote areas, difficulties in finding leave cover often results in doctors missing out on professional development opportunities.

There may be limited opportunities in some areas of research in WA, resulting in vocational trainees in those specialties migrating interstate or overseas at the conclusion of training in search of professional development opportunities; leaving behind funded vacant consultant positions. The availability of academic appointments, the ability to undertake research and to have opportunities for continuing professional development, and sabbaticals, are attractive and rewarding components of registrar and consultant positions; and are key retention strategies.

6.2.7 Lifestyle factors

In many specialties the specialist workforce is putting increasing value on work life balance and many are choosing to work part-time. Increasing numbers of both male and female vocational trainees are now seeking part-time positions and are organising part-time arrangements with other like-minded colleagues, prior to negotiating employment with health services. Part-time training works well for some specialties, e.g. psychiatry, but can be difficult to accommodate in other specialties, e.g. surgical-based training where increasing hours are required to address the components of training in the required time.

An increasing part-time workforce has an effect on the supply-demand equilibrium, affecting time in training and coverage of rosters in some specialties. Specialties with a large demand for part-time positions (trainees and consultants) are likely to face difficulties achieving equilibrium between supply and demand unless there is a significant increase in trainee throughput.

Other factors that can impact on sustaining a specialist workforce, especially in outer metropolitan, rural and remote locations include: professional and personal isolation; community expectations; the needs of the individual and their family; travel requirements; limited professional and educational opportunities; filling multiple roles; and long working hours.

Key findings:

- Career choices of prevocational doctors can create imbalances across the specialties.
- Differences in college training programs affect training outputs.
- Increasing medical graduate numbers are creating competition for positions on the specialist training pathway, particularly vocational training positions, and consultant positions.
- There will be increasing numbers of medical practitioners sitting in service positions; either temporarily while they wait for a vocational training position, or as a career choice.
- Changing lifestyle factors, including an increase in part-time work impact on the balance and distribution of the specialties.
- Some specialties and rural and remote locations are reliant on IMGs.

- WA is losing medical practitioners interstate and overseas due to lack of funded employment opportunities and centres resourced to promote academic teaching and research excellence.
- There is a large cohort of specialists that are expected to retire within next 10 years.

Proposed Strategies:

- Influence early career choices of junior doctors in order to address the over and under supply in some specialties.
- Integrated career pathways to accommodate the increasing number of medical graduates flowing through into the medical training pathway, including:
    - Collaborate with colleges and health services to accredit and distribute sufficient vocational training positions to ensure a balanced specialist workforce and effectively meet WA's future health service needs.
    - Work with colleges to develop alternative training pathways, e.g. vocational training in non-traditional settings (private and rural and remote) and dual training programs.
    - Further investigate the role of the service registrar, and the potential development of career and training pathways for committed long term service registrars (e.g. hospitalist or career medical officer).
- Provide information to the specialties and health services for succession planning for the large anticipated cohort of retirements.
- Implement OCAM, the proposed health reform for the optimal distribution of consultants (see page 40).
- Engage with stakeholders to identify incentives that may improve the recruitment and retention of the specialist workforce, including consideration of flexible work practices to accommodate the changing requirements of the specialist workforce (i.e. part-time work).
- Continue to support implementation of the generalist medical workforce initiative.
- Continue to support the WBA pathway to provide opportunities for suitable IMGs to achieve general registration, as a rural and remote retention strategy.
- Support mechanisms that enable the recruitment of IMGs to fill areas of need which demonstrate a workforce shortage, e.g. AoN determinations.
- Promote resourcing to assist in the growth of centres of excellence (academic and research) in WA and engage with colleges and health services to see how the culture can be changed.
- Review lessons learnt from the JDBC and consider the future of such opportunities beyond 2014/15.

6.3 Efficiency

Within the medical workforce context, efficiency refers to the ability to produce quality health care services at a reasonable cost, with access to innovative technologies as they become available. The balance between the supply and demand of the specialist workforce also affects efficient delivery of services.

6.3.1 Government funding

Willingness or ability to fund is the strongest driver of supply. The Australian Government is responsible for national health issues evidenced by the range of nationally-based programs and initiatives that have been introduced. The introduction of ABF/M implies that willingness to fund (beyond base funding) is perceived to be a greater responsibility of states and territories.

WA has had the highest per capita revenue base of all states and territories and hence the greatest ability to fund state government portfolios as noted in the *Australian Government Commonwealth Grants Commission Summary* in 2010: "Western Australia has the highest assessed fiscal capacity due to its

very high revenue raising capacity." [43,44]; however, it cannot be assumed that this will remain unchanged so review of health portfolio funding in the context of wider State Government commitments will need to be continued.

6.3.2 Workforce excess and shortage

Workforce planning must address both expected shortages and supply issues and keep pace with demand at all times, in all locations. A small excess should be created where feasible; and any detectable shortage should be immediately addressed. Creating any excess beyond 5% in any consultant specialty represents a significant underutilisation of resources that have the potential to be better used elsewhere, whereas a less than 5% shortage may remain undetected, or have little impact, in terms of health service delivery.

6.3.3 Labour market competition

In contrast to service market competition, the labour market is strongly competitive; there are limited positions in the medical training pathway, from intern to consultant, and entry to vocational training programs is structured to assist with selecting the most competitive candidates. All vocational training positions are limited by funding and accreditation. A lack of coordinated workforce planning has resulted in supply exceeding demand in some specialties, and demand exceeding supply in most specialties.

Competition for vocational training positions in some specialties can result in highly suitable trainees 'sitting' in a service or basic training position until a vocational training position becomes available. There is also increasing competition for fellowship and consultant positions with some new consultants occupying a senior registrar position for several years, while waiting for a funded fellowship or consultant position. Alternatively they may have to travel interstate or overseas to secure a fellowship position to complete their training, effectively losing them from the WA specialist workforce.

Key Findings:

- There is an imbalance between supply and demand in many specialties in WA.
- There is increasing competition for vocational training and new consultant positions.
- The introduction of ABF/M means states and territories are more responsible for the acquisition of appropriate revenue and distribution of funding.

Proposed strategies:

- Identify strategies to improve health services reach an optimal specialist workforce by maximising their access to Australian Government funding through ABF/M.
- Review other states and territories and consider applicability to WA.
- Implement OCAM (refer to page 40).
- Work collaboratively with colleges and other stakeholders to review vocational training to ensure it is coordinated and supports a balance of supply and demand in WA.

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[43] Council of Australian Governments. (1999). *Intergovernmental Agreement on the Reform of Commonwealth-State Financial Relations* Appendix B http://www.coag.gov.au/node/75

[44] Commonwealth Grants Commission Summary. (2010). *Report on GST Revenue Sharing Relativities – 2010 Review,* Vol. 1 – Assessment of State Fiscal Capacities, Australian Government, Canberra

7. Programs

7.1 Specialist Workforce Capacity Program

The SWCP is an ongoing program that has two main aspects; the mapping and analysis of the specialist workforce by specialty to identify specialties that are at risk of shortfall now and into the future (i.e. there is a significant current or projected disparity between supply and demand); and the development of targeted interventions for those specialties, such as the generalist medical workforce initiative.

As planned, the SWCP workforce data collection and analysis process was repeated in 2013, with new and improved tools and data being included. SWCP 2013 was designed to capture the following information:

- Current and future projected consultant shortfall or excess.
- Trainees required to service current and projected future demand.
- Negotiations and discussions with colleges on trainee throughput.
- Current and future projected consultants required from interstate and/or overseas to meet service demand.
- Evaluation and investigation of alternative health service delivery programs and initiatives.

As the SWCP is a key tool in understanding and informing planning for the specialist workforce in WA, some aspects have already been discussed:

- Information on the SWCP data collection process (section 3.5, data collection).
- The analysis of supply and demand, including the modelling process and the application of standardised risk assessments (section 5, WA consultant workforce analysis).
- Specific information on the registrar workforce and consultant workforce (sections 4.3 and 4.5, respectively).

This section will provide further information on specific programs and activities that were developed as a result of SWCP data collection and analysis in 2011 and/or 2013, namely:

- The targeted generalist medical workforce initiative or GMWP.
- The development of specialist workforce profile reports and consultations with specialty representatives.
- A proposed whole of health modelling framework (OCAM) to optimise the volume and mix of WA's consultant workforce.
- An analysis of 'lessons learnt' from the data collection and analysis process and recommendations that will inform SWCP 2015.

7.1.1 Generalist Medical Workforce Program

The SWCP 2011 identified that WA was in critical shortage of generalists[45]. The findings were also supported nationally, with HWA recognising the imbalances between generalists, specialists and subspecialists in the Australian workforce, and acknowledging this was an important issue to be addressed[46].

SWCP 2011 data analysis and consultation revealed that the most significant issue was not necessarily one of total supply but rather one of distribution, with little or no service generalist provision in some of

[45] Medical practitioners whose primary vocation is general medicine, general surgery, paediatric medicine or general practice

[46] Health Workforce Australia 2012: *Health Workforce 2025 – Volume 3 – Medical Specialties*

the rural, remote and outer metropolitan areas. An inadequate supply of generalists has serious implications for the quality, cost and outcomes of care for patients presenting with acute undefined illnesses and/or those with complex illnesses who continue to require specialist intervention. It has been identified that without intervention to build the capacity of the generalist workforce:

- There will be an increasing and inefficient reliance on specialists and subspecialists to diagnose conditions and to determine treatment plans.
- The status and strength of the generalist workforce will decrease due to retirements and insufficient training numbers to maintain the current workforce.
- Demand will outstrip supply resulting in a need to significantly increase the recruitment of IMGs.

In order to take steps towards strengthening the generalist workforce, and to increase generalist training capacity in WA, the GMWP was developed. The focus of the GMWP is consistent with the WA Health CSF 2010; it takes into account anticipated growth in service demand, and focuses on the provision of community-based care and services at general hospitals closer to where people live.

A comprehensive consultation process was undertaken to inform the development of the following GMWP strategies:

- To strengthen departments of general medicine/surgery/paediatrics and acute medical/surgical wards through embedding generalists in health service/hospital workforce planning.
- Recruit and retain appropriately trained generalists.
- Increase the attractiveness of a generalist career by offering financial and lifestyle incentives.
- Promote dual specialisation, with general on-call.
- Increase/improve core generalist registrar advanced training posts across metropolitan, outer-metropolitan and rural and remote settings in adult internal medicine, paediatric medicine and general surgery.
- Strengthen IMG recruitment to the generalist workforce.

The following strategic documents were developed to facilitate the implementation of the aforementioned generalist strategies, it is also proposed that they will be adapted and utilised for other SWCP specialties that have been identified as being in critical or high shortfall risk:

- *Generalist Medical Workforce Development Framework* (Framework). The Framework provides a policy framework to assist WA Health in undertaking a 'whole of health' approach in improving and promoting a sustainable high quality generalist workforce.
- *Generalist Medical Workforce Action Plan* (Action Plan). The Action Plan was developed to implement the Framework's overarching key priorities and strategies. The Action Plan provides scenarios based on future projections and trends and indicative costs through the *Generalist Medical Workforce Cost Model*. The Action Plan also provides a plan to address the identified key priorities and strategies through the *Generalist Medical Workforce Implementation Guide*.

Priorities for the generalist workforce, identified in in the Framework and Action Plan, include:

- A commitment from WA Health to increase generalist positions in order to maximise potential improvements in the quality and cost-effectiveness of patient care.
- Appointing an executive champion to facilitate implementing the identified strategies and initiatives identified in the Framework and Action Plan.
- Raising the profile of the generalist workforce in WA and nationally.
- Expanding and formalising links with health services (public and private) and colleges.

General medicine workforce development project

In February 2014, a general medicine executive champion (Clinical Lead) was appointed for six months to implement key strategies identified in both the Framework and the Action Plan, specifically for the general medicine workforce.

A number of outcomes were achieved to strengthen the position of the general medicine training program, which should have a positive impact on the general medicine workforce in the longer term.

These included:

1. ***Strengthening the general medicine training program***
    - In collaboration with stakeholders, an assessment of the effects on the general medicine training program was undertaken to assess the impact of fiscal restraints in the current environment, ABF/M, reconfiguration of health services, and implementation of change management strategies.
    - Identification of potential new general medicine training rotations at Fiona Stanley Hospital (FSH), FHHS and SCGH.
    - Completion of a general medicine trainee evaluation which provided valuable feedback to hospitals on how training could be strengthened.
    - The development of a corporate governance framework, and supporting documents, for the general medicine training program, which may be applicable to serve as a model for other specialties with similar challenges.
2. ***Development of a dual training pathway***
    - Progress planning for a formal dual training pathway in WA between general medicine and another suited subspecialty, such as endocrinology or gastroenterology.
3. ***Increasing rural, remote and outer metropolitan training and physicians***
    - Establishing links with the Rural Clinical School of WA (RCSWA), Rural Health West (RHW) and rural, remote and outer metropolitan hospitals.
    - Development of strategies to improve attraction and retention of general medicine physicians to rural and remote and outer metropolitan areas.
    - Collaborating with rural, remote and outer metropolitan hospitals regarding expanding the provision and support for building capacity of the general medicine training program in the rural, remote and outer metropolitan areas.

General medicine training has progressed significantly in the last decade, and levels of interest in the general medicine training program have surpassed the training capacity of the program. The following strategies were recommended as next steps by the Clinical Lead and are considered priorities for further development of the generalist workforce in WA:

- Continue to expand posts for general medicine physicians.
- Attract and retain appropriately trained staff in general medicine consultant posts, i.e. an essential selection criteria requirement would be general medicine training.
- Attract and retain trainees and physicians in rural, remote and outer metropolitan areas through the established links with RCSWA and RHW.
- Continue to pursue support from WA Health executives to implement a formal dual training pathway in WA, and explore opportunities with other specialties.
- Establish central management and coordination of the general medicine training program.

7.1.2 Specialist workforce profile report and consultation

Following the analysis of the SWCP 2013 data, specialist workforce profile reports were produced for each specialty. The purpose of each profile report was to amalgamate all prior key information by specialty for subsequent discussion with the relevant college.

Each profile report contained the following components:

- A consultant report: a workforce summary, including the number of consultants in the workforce, the consultant age distribution, the current and future shortfall risk assessment, and key workforce issues concerning the specialty.
- A registrar report: the number, type and location of vocational registrar positions for the specialty, and the number and registration types of IMGs occupying registrar positions.
- Shortfall projections:
    - Demand and supply estimates for the specialty in 2013, with projections for 2016 and 2021.
    - The consultant shortfall risk assessment and the additional consultant positions required in WA to service demand each year from 2013 to 2021.
- 2013 registrar information: listed by name and type for validation by college.
- Output report: the estimated number of additional vocational trainees necessary to commence per year to meet the 2021 demand target, adjusted for program length, retention rate and other assumptions.

An example profile report is included in Appendix 23.

The profile reports were designed to facilitate discussion between OCMO (a consultant medical practitioner and a MWB representative) and representatives from the relevant college and specialty, to assist WA Health in planning for optimal trainee throughput to meet future demand. Consultation has been allocated according to shortfall risk assessment status, with priority given to those specialties that have been identified as at critical risk of current of future shortfall. It is intended that consultation will eventually be undertaken with all specialties.

The aim of the consultations is to clarify and validate the information contained in the profile report, and obtain detailed information on the registrar workforce including service positions, vocational trainee numbers and anticipated trainee throughput. Discussions also provide an opportunity to explore modelling assumptions, validate the precision of data, and identify factors that may impact on workforce planning and policy development, including; changes in accreditation of trainee positions or training course requirements, new training pathways, a general commitment to increase or decrease trainee numbers, or the development of college strategies to address the issues.

The information shared during the consultation process will inform future workforce planning and will be used to refine development of specialty specific strategies to address projected under or over supply of consultants. Further work will be undertaken by MWB to ensure that junior doctors are informed of the outcome of the SWCP and consultation process to guide them in their career planning.

7.1.3 Optimal consultant allocation model to address projected consultant shortfalls

The OCAM is an evidence-based allocation model which has been developed by MWB to assist in addressing the projected consulted shortfalls identified by SWCP 2013. The annual application of OCAM across WA Health provides for:

- The more efficient allocation of consultant FTE across health services by reducing any surplus of consultants in oversupplied specialties by natural attrition (i.e. retirements) to address shortages in undersupplied specialties.

- The maximisation of potential funding revenue in an ABF/M environment while maintaining a quality health service.
- Optimisation of the specialist workforce at hospital, health service and whole-of-state levels.
- Effective utilisation regardless of the given current economic environment.

OCAM is a long-term program; however, it has the potential to create an immediate short-term impact. The application of OCAM will require collaboration between the Department and health services to increase consultant numbers in agreed specialties, within existing budgets and at the current annual growth rate, in a 'whole of health' approach to workforce planning. The application of OCAM should result in both the improved utilisation of existing resources to address imbalances between supply and demand in some specialties; and increased revenue in an ABF/M environment.

OCAM provides two key strategies which can be achieved simultaneously to move to both a more optimal volume and mix of consultants:

1. The reallocation of FTE/funding from non-essential consultant positions (vacated due to retirement) in specialties in oversupply, to fund new consultant positions in shortfall specialties.
2. The annual application of the six priorities identified in OCAM, in sequence, across WA Health to ensure rapid acceleration to a more optimal volume of consultants in an ABF/M environment:
    - **Priority one:** Maintain supply = demand for surgical specialties (highest revenue potential) and emergency medicine (essential service).
    - **Priority two:** Maintain supply = demand for core support specialties especially radiology and pathology (both high revenue potential).
    - **Priority three:** Reduce all critical and high risk non-surgical specialties to medium or low risk.
    - **Priority four:** Reduce all medium risk non-surgical specialties to low risk (sequence by highest revenue potential where feasible).
    - **Priority five:** Improve any high revenue, low risk specialty nearer to supply = demand.
    - **Priority six:** Improve any low revenue, low risk specialty nearer to supply = demand.

It is proposed that the priorities are worked through on an annual basis starting at priority one and moving as far down the priority list as possible each year. By repeating the process each year the tasks become easier and the difficult decisions in the initial time periods will disappear.

The key to the success of OCAM is collaboration across WA Health in the implementation of the model and the application of the strategies and six priorities. The Department will provide business rules for determining maximum and minimum numbers per speciality each year; whilst the health services will determine and agree upon the actual numbers of consultants per health service, per speciality, per year. This approach would see the health services making decisions collaboratively about allocating consultant FTE resources from a state wide (public sector only) pool of resources.

Preliminary modelling (included in Appendix 21) has shown the following short-term impacts, should OCAM be applied in 2015:

- Elimination of shortfalls in the surgical and core support service specialties in the first year (with maintenance thereafter).
- Elimination of shortfalls in the specialties with a current high or critical shortfall risk in the second year (with maintenance thereafter). OCAM ensures that once all high and critical shortfall risks have been eliminated, the occurrence of a specialty reaching a high or critical level would be a rare event.
- Reducing all 2021 consultant shortfalls to low and medium shortfall risks by end 2017 (four years in advance).

Further information on OCAM is available from MWB upon request.

7.1.4 Recommendations for SWCP 2015

During the course of the SWCP 2013 data collection, validation and analysis process, a number of potential areas for improvement were identified. The following sections include recommendations that will be applied to the data gathering process for SWCP 2015, including:

- Revise the reporting of SWCP specialties to:
    - Group specialties by their ABF/M compatibility.
    - Separate out paediatric and adult subspecialty workforces.
    - Separate out physician and laboratory-based subspecialty workforces.
- Develop alternative modelling methodologies for:
    - Small volume specialties.
    - Laboratory-based specialties.
- Adjust the retirement age for surgical specialties and emergency medicine from 65 years to 60 years.

Revise the reporting of SWCP specialties

The specialties included in the SWCP should be consistent with college training programs; formally recognised specialties; the health setting (hospital and private practice); MWB, OCMO and WA Health objectives; and an ABF/M environment. The way specialties are identified must provide continuity over time to determine trends and enable direct comparisons between time periods, and they must be sufficiently detailed to provide meaningful results, but not overly detailed (to avoid small sample/volume issues).

In SWCP 2013, 45 specialties were identified; however, during analysis it became apparent that some specialties (and their sub-specialties) were not well understood at a specialty level and would be better understood split into their component parts, at least during the analysis phase. It is being proposed that the reporting of some specialities be changed for SWCP 2015. The proposed changes are outlined in the following Table 10.

Table 10. Arrangement for medical specialties for 2015

Specialty	Comments and Actions for 2015
Medical Partition	
Addiction Medicine	Newly recognised specialty in 2013
Cardiology	
Clinical Genetics	No adult Geneticist currently in WA
Clinical Pharmacology	Newly recognised specialty in 2013
Dermatology	
Endocrinology	
Gastroenterology	
General Medicine	
Geriatric Medicine	
Haematology	Split between Pathology Haematology & Physician Haematology
Immunology and Allergy	Split between Pathology Immunology, Physician Immunology & Allergy
Infectious Disease	
Medical Oncology	
Nephrology	
Neurology	
Nuclear Medicine	Consider as a speciality (separate from Radiology)
Obstetrics & Gynaecology	
Occupational & Environmental Health	Newly recognised specialty in 2013
Ophthalmology	
Paediatric Medicine- Clinical Genetics	Consider as a specialty (separate from Adult - Clinical Genetics)
Paediatric Med- Emergency Medicine	
Paediatric Med- General Paediatrics	
Paediatric Medicine- Neonatal Medicine	
Paediatric Medicine- Other	Treat the same as adult medicine specialties
Palliative Care	
Psychiatry	
Radiation Oncology	
Rehabilitation Medicine	
Respiratory & Sleep Medicine	
Rheumatology	
Sexual Health	
Sport & Exercise Medicine	Newly recognised specialty in 2013
Surgical Partition	
Cardiothoracic Surgery	
ENT Surgery	
General Surgery	
Neurosurgery	
Orthopaedic Surgery	
Paediatric Surgery	
Plastic Surgery	
Urology	
Vascular Surgery	
Core Medical Support	
Anaesthesia	
Pain Medicine	Newly recognised specialty in 2013
Emergency Medicine	
Intensive Care	
Core Laboratory Support	
Pathology- Anatomical	
Pathology- Haematology	Consider as a specialty (separate from Physician Haematology)
Pathology- Immunology	Considered as a specialty (separate from Physician Immunology)
Pathology- Microbiology	
Pathology- Other	
Core Imaging Support	
Radiology	
Other	
Medical Administration	
Public Health	

The recommendation to revise specialty reporting in SWCP 2015 has three main aspects:

1. Specialties will be grouped according to their ABF/M compatibility

Specialties in SWCP 2015 will be grouped accordingly to their compatibility with the ABF/M framework and the WAB demand model, providing convenient terminology using DRGs. Each specialty will be assigned to one of the following partitions:

- Medical and surgical partition.
- Core medical support services (including emergency medicine, intensive care medicine, anaesthesia and pain medicine).
- Core laboratory support services or core imaging support services (pathology and radiology).
- Other (medical administration and public health medicine).

2. Paediatric and adult medicine subspecialty workforces will be separated

Paediatric and adult medicine subspecialties were combined in SWCP 2013; however, in SWCP 2015 there will be a paediatric/adult medicine split within each subspecialty to acknowledge feedback received during consultations that the management of patients in a particular subspecialty can be quite different for paediatrics and adults.

This will result in some very small numbers for the paediatric subspecialties which will need some further consideration.

3. Some subspecialties under pathology and radiology will be identified separately

Pathology and radiology are core support services whose activity is not captured well within the current ABF/M patient classification systems. Under the ABF/M framework, cost of laboratory and imaging services are distributed as an indirect cost across all patients rather than as a direct cost based on the test or image performed for an individual patient or diagnosis. A further problem under the ABF/M framework is that pathology tests (and radiology imaging) performed within the hospital environment are not restricted to hospital patients.

In addition, both have physician-oriented and laboratory-orientated (or non-clinical) subspecialties. Given the significant difference in training and roles undertaken by the two types of personnel, to support specialist workforce planning, in SWCP 2015 it is recommended that these orientations be separated for the purpose of undertaking supply and demand estimates and projections.

SWCP 2015 demand and supply estimates and projections for pathology should:

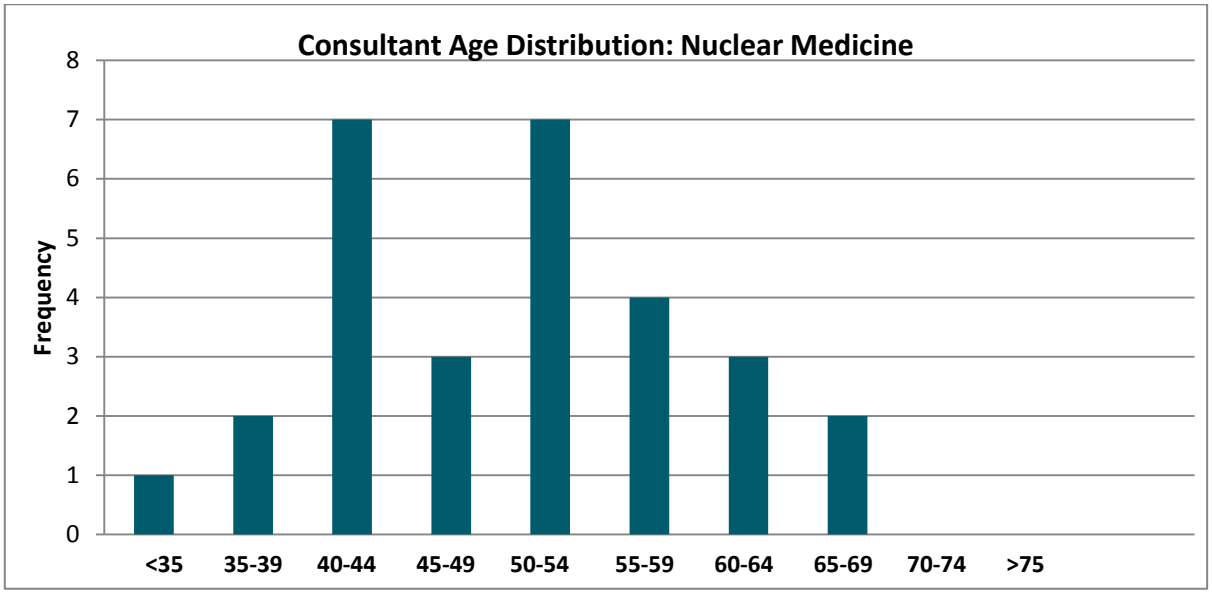
- Split physician-immunology and allergy from pathology-immunology (laboratory-based).
- Split physician-haematology from pathology-haematology (laboratory-based)
- Include separate estimates for anatomical pathology and microbiology, within pathology, as they have significant growth in service demand and a higher volume of service delivery than immunology.
- Define physician-infectious diseases role from microbiology (laboratory-oriented).

Under the ABF/M inpatient classification framework, the cost of radiology services are distributed as an indirect cost across all patients while nuclear medicine patients are identifiable within the patient classifications (medical partition). The SWCP 2013 identified a total of 219 radiology consultants in WA:

- 18 were nuclear medicine physicians (16 adult medicine and 2 paediatric medicine) and a further 11 were dual trained specialists in diagnostic radiology and nuclear medicine.
- The dual trained consultants were working approximately 0.5 FTE in both specialties and the nuclear medicine physicians were working approximately 1.0 FTE.

- The consultant age distribution of nuclear medicine is shown in Figure 6. Median age was 50 years.
- Estimated 2013 demand for nuclear medicine was 22 FTE suggesting that supply was approximately equivalent to demand.

Figure 6: Consultant age distribution for nuclear medicine



It is probable that nuclear medicine will be formally recognised as a specialty in the near future.

SWCP 2015 demand and supply estimates and projections for radiology should:

- Split radiology and nuclear medicine (physicians).

Develop alternative demand modelling methodologies for small volume specialties

Consultant supply and demand estimation of small volume specialties is usually difficult as quantity of activity data is small and often volatile from year to year. All small consultant volume specialties have unique issues under the ABF/M framework and these issues must be understood when undertaking workforce analysis and planning, for example:

- **Clinical genetics** is almost exclusively an outpatient service with identifiable outpatient activity. Current activity data appears to be incomplete.
- **Clinical pharmacology** has no directly assignable patients and hence no reported activity. In 2013 there was a single 0.5 FTE in the public sector. It is also a newly recognised specialty in 2013.
- **Sports and exercise medicine** is currently confined to the private sector and has no assignable hospital activity. It is a newly recognised specialty in 2013.
- **Rehabilitation medicine** has directly assignable activity, but a significant proportion of the reported activity (and patient treatment) was most likely performed by allied health professionals (physiotherapy, speech pathology, etc.).
- **Nephrology** (a moderate volume specialty) where renal dialysis (which is usually managed by nursing staff or the patient) can only be counted as hospital inpatient activity under ABF/M and assigned to nephrology consultants, whether it is performed in a hospital, satellite clinic, the patient's home or outsourced to private practice.
- **Sexual health medicine** may have directly assignable patients but there is a significant overlap with infectious diseases. At present, it must be assumed that sexual health medicine and infectious diseases share some inpatient AR-DRG activity codes.

The main issue with small volume specialties is that ABF/M defined activity is too low to derive a reliable change in demand from one year to the next. In SWCP 2013, a 3.5% increment (the average for all consultant specialties combined) was assumed for small volume specialties, except for paediatric surgery where there was sufficient volume and range of surgical procedures performed to derive a reliable change in demand estimate from one year to the next.

For SWCP 2015 is will be important that alternative small volume demand modelling methods are investigated.

Develop alternative demand modelling methodologies for laboratory-oriented specialties

As mentioned previously, pathology and radiology activity is not directly reported within the ABF/M framework; instead expenditure is dispersed across all cost centres in a hospital (similar to other "cost buckets" such as linen and cleaning service costs, administration costs, hotel costs etc.).

Pathology and radiology activity measurement remains on the IHPA "to do" list and may improve in the future; however for SWCP 2015, alternative pathology/radiology demand modelling methods will need to be explored.

The number of tests performed and images produced by type is most likely available at the individual hospital department level. This data could provide a more reliable estimate of pathology and radiology activity than current available methods. Tests performed and images produced are likely to provide an improved estimate of pathology/radiology activity than current ABF/M methodology.

Adjust the retirement age for the surgical specialties and emergency medicine from 65 years to 60 years

The analysis of consultant retirements between 2011 and 2013 revealed that surgical consultants retired at a significantly younger age than non-surgical consultants[47]; however, SWCP consultant supply estimates assume a retirement age of 65 years for all specialties.

Further analysis was undertaken to quantify the impact for future refinement of the supply-demand modelling framework of a potential increase of retirement age for non-surgical consultants from 65 to 67 years, and a decrease in retirement age for surgical consultants from 65 to 60 years. The number of personnel expected to retire under the changed retirement ages were enumerated and entered into the consultant supply component of the model (consultant demand component unchanged), with consultant shortfalls and risk assessments recalculated.

Increasing the retirement age from 65 to 67 years for nonsurgical specialties would result in a decreased risk assessment by 2021; however, the impact was found to be minimal. The increase in retirement age only caused a change in risk assessment for six specialties (see Table 11), all of which had a known significant proportion of consultants working beyond 65 years of age in 2013.

[47] The difference was highly statistically significant ($p<0.001$)

Table 11: Changes in risk assessment of non-surgical specialties if SWCP retirement age assumption increased to 67 years

Non-Surgical Specialty	2013		2021	
	%	Risk	%	Risk
Anaesthesia	89	Medium	93	Low
Medical Administration	85	Medium	95	Low
Neurology	69	Critical	76	High
Pathology	87	Medium	90	Low
Psychiatry	78	High	83	Medium
Radiation Oncology	73	High	83	Medium

Decreasing the retirement age from 65 to 60 years for surgical specialties would result in an increased risk assessment by 2021; however, the impact was also found to be minimal. The increase in retirement age only caused a change in risk assessment for three specialties (see Table 12), all of which have a known significant proportion of consultants working beyond 55 years of age in 2013.

Table 12: Changes in risk assessment of surgical specialties if SWCP retirement age assumption decreased to 60 years

Surgical Specialty plus Emergency Medicine	2013		2021	
	%	Risk	%	Risk
Cardiothoracic Surgery	88	Medium	71	High
Orthopaedic Surgery	92	Low	82	Medium
Urology	73	High	67	Critical

It should also be noted that cardiothoracic surgery is a small volume specialty and three personnel were aged 52 years or more in 2013 implying they would retire by 2021 under this scenario. The large change in percentage shortfall for cardiothoracic surgery is due to the small volume of consultants; 3 of 11 consultants in 2013 were aged 52 or over.

In summary, shifting the retirement ages up two years for nonsurgical and down by five years for surgical specialties (and emergency medicine) would improve the precision of risk assessments; however, it is unlikely that changing the retirement age would result in a change of risk assessment of more than one risk category (except for very small volume specialties where risk assessments are known to be volatile).

In a consultant shortfall environment, the estimation of later than usual retirement (i.e. increase to 67) has no practical consequences (the occurrence is beneficial), while estimation of earlier than usual retirement has practical consequences as it can be detrimental in a shortfall context. Therefore, in SWCP 2015 it is recommended that:

- The age 65 year retirement assumption for nonsurgical specialties is retained.
- An age 60 year retirement assumption for surgical specialties (and emergency medicine) is introduced. In an ABF/M environment a large potential loss in funding revenue will occur for any shortfall in a surgical specialty.

7.2 Workplace-based assessment

In the past, assessment processes for IMGs have varied depending on the jurisdiction, the nature of the position applied for and the requirements of the local medical board, college and employing authority. In 2006, COAG directed health ministers to implement a nationally consistent approach[48] to ensure appropriate standards in qualifications and training as well as to increase the efficiency of the IMG assessment process through nationally implemented pathways.

In 2010, the newly introduced National Registration and Accreditation Scheme required IMGs on the standard pathway to pass the AMC Multiple Choice Questionnaire prior to being eligible for limited registration with the MBA. Once limited registration has been achieved, IMGs are on a four year pathway with the MBA, during which time they must demonstrate satisfactory progress to general registration by passing the AMC clinical examination or having booked to re-sit the exam. Long waiting lists for the AMC clinical examination and the high failure rate among participants, prompted the introduction of a second avenue for IMGs on the standard pathway in 2010, WBA.

WBA is a program of assessments, supervision and feedback to fulfil the requirements for the AMC certificate, undertaken over 12 months in WA. Assessments occur across the six clinical areas of adult medicine, adult surgery, child health, women's health, mental health and emergency medicine at an end-of-intern level. The success of WBA is recognised with the *Lost in the Labyrinth* report[49] which notes that the WBA pathway provides an effective method of clinical assessment of IMGs. The report recommended increasing access to WBA for IMGs[50].

The Department is the AMC accredited authority to implement WBA in WA, and has been supported by the Australian Government, through funding contracts with the Department and HWA, to pilot WBA at three sites in WA including two rural locations and a public-private collaboration. AMC accreditation was expanded to include an additional rural location in August 2014.

Many of the candidates undertaking WBA have only been exposed to one clinical area for a number of years and require intensive support with mentoring to gain confidence in other clinical areas. While WBA candidates have typically failed the AMC clinical examination previously, WA WBA has a pass rate of 97.5% (compared to a 40% national pass rate for the AMC clinical examination). Since 2011; 39 candidates have successfully completed WBA in WA, gaining their general registration with the MBA. The number of candidates successfully completing WBA by location in is shown in Table 13.

Table 13: The number of candidates successfully completing WBA by location

WBA location	2011	2012	2013
Bunbury Hospital	12	10	9
Hollywood/Joondalup Hospital	0	3	0
Kalgoorlie Hospital	0	0	5
Total	**12**	**13**	**14**

NB: Hollywood/Joondalup Hospital commenced in 2011/12; Kalgoorlie Hospital commenced in 2013.

As well as providing an alternative pathway for IMGs to gain general registration, WBA is one of the most effective recruitment and retention tools for rural areas; in December 2014, 71% of all WBA candidates

[48] Council of Australian Governments' Meeting 10 February 2006 http://www.coag.gov.au/meetings/100206/index.htm

[49] House of Representatives Standing Committee on Health and Ageing (2012). *Lost in the Labyrinth Report on the inquiry into registration processes and support for overseas trained doctors*. The Parliament of the Commonwealth of Australia.

[50] Review of Australian Government Health Workforce Programs – Mason Review, 2013. Accessed from http://www.health.gov.au/internet/main/publishing.nsf/Content/work-health-workforce-program-review

from the 2011 to 2013 cohorts were employed in rural locations[51]. WBA also builds the capacity of participating medical practitioners through:

- Familiarising candidates with the health service environment and assisting with assimilation into the Australian health workforce.
- Establishing a collegial support network.
- Providing immediate feedback in the usual work environment.
- Integration into the local community through regular mentoring and support.

WBA is being supported by the AMC to move out of the pilot phase and become a sustainable standardised program. In 2014, the WA WBA program implemented a standardised assessment blueprint and was approved by the AMC to facilitate sustainability at health service level by increasing the candidate fee to $10,000 each. HWA allocated additional funding to develop an orientation package for IMGs involved in the WA WBA program. All resources are now available online, accessible at www.overseasdoctors.health.wa.gov.au.

With changes to the Australian Government's funding priorities, the WA WBA program requires support at both Department and health service levels in 2015/16 to ensure that the program requirements can be met in future, including:

- Program accreditation, reporting, evaluation and strategic planning, including development or coordination of development of program resources and training workshops by the Department.
- Administrative support for the program director and on-site support for the candidates in collaboration with the Department to ensure the program is meeting the AMC guidelines and requirements.

In 2014/15, MWB will continue to strengthen the WBA program at hospitals offering WBA (Bunbury, Kalgoorlie and Geraldton); and will support expansion of accreditation to additional new sites. Increasing sustainability of the program in WA will also be a priority including the continued integration of WBA into medical education units (MEUs), and exploration of alternative funding options and opportunities to incorporate general practice rotations in rural areas.

7.3 Area of Need

Specialist workforce shortages in some specialties and the maldistribution of the medical workforce impact on the ability of health services to provide adequate and timely care to patients, particularly in rural and remote, and some outer-metropolitan areas. Where locally trained doctors cannot be recruited, IMGs make an important contribution in supporting health service delivery. Australia's reliance on medical practitioners who qualified and trained overseas has varied over time; however, at June 2014, approximately 5% of all medical practitioners registered in WA were IMGs registered under the AoN registration category[52].

The Australian, State and Territory Governments have enacted a number of measures to support the recruitment of IMG practitioners to medical practices in areas where there are doctor shortages, while ensuring that priority is given to the employment of Australian-trained doctors. The two most significant measures to identify medical practitioner shortages in Australia are:

- District of Workforce Shortage (DWS) administered by the Australian Government. DWS is assigned to a location where Medicare statistics indicate there is an insufficient number of medical practitioners in a geographical location to service a population. It is linked to provisions in the *Health Insurance Act 1973* (Act), specifically section 19AB of the Act. In practice, DWS restricts IMGs to work in areas of workforce shortage for a minimum period of 10 years (from the

[51] Self-reported through the Australian Health Practitioner Regulation Agency as principal place of practice.

[52] According to data provided to MWB by AHPRA in June 2014

date of their first medical registration in Australia) to access Medicare benefit arrangements. This restriction can be reduced if IMGs work in eligible rural and remote areas.

- AoN is a service classification administered by each of the state and territories. In WA, AoN is used by the Department to identify locations experiencing medical workforce shortages, and is the mechanism used to recruit IMGs to those locations in order to meet the health service needs of the community.

Employers that have, over time been unable to recruit an Australian-trained doctor to a specific position can apply to the Department to have that position deemed an AoN, enabling them to recruit an IMG for a defined period, to a location experiencing workforce shortages for a particular specialty. AoN submissions from employing health organisations throughout WA are approved by the Minister for Health, delegated to the Department's Chief Medical Officer. AoN determinations are published in the Government Gazette and on the Department's website.

Applications for AoN, which are processed by MWB; must meet all the assessment criteria, including evidence of extended labour market testing (advertising), before an AoN determination will be considered. Due to the dynamic nature of the medical workforce and given the increasing number of Australian-trained graduates entering the medical workforce, AoN declarations are not guaranteed and applications are assessed on a case-by-case basis.

In 2013, 20 new AoN determinations were granted in WA; 40% (n=8) of those determinations were for rural areas and 80% (n=16) were for specialist positions. In 2014, 57% of new AoN determinations (n=13) have been for outer metropolitan areas; 69% (n=9) of those were for GP positions. A summary of current determinations by location is included in Table 14.

Table 14: Current area of need determinations by location (at 14 December 2014)

Year	Inner metropolitan		Outer metropolitan		Rural (Regional, rural, remote)		Mixed location (Metro and rural)		Total
	GP	Specialty	GP	Specialty	GP	Specialty	GP	Specialty	
2014	1	5	9	4		2	-	2	23
2013	1	5	2	1	1	7	-	3	20
2012	2	3	26	1	5	10	-	1	48
2011	2	-	12	4	5	5	2	2	32
2010	-	1	2	1	-	2	-	-	6
2009	-	1	-	-	-	-	-	-	1
1995	-	-	-	-	-	1	-	-	1
Total	**6**	**15**	**51**	**11**	**11**	**27**	**2**	**8**	**131**

On 14 December 2014, there were 131 active AoN determinations in WA: 53% (n=70) of those were for 'general medical services' (GPs) and 76% (n=100) were in rural or outer metropolitan locations. The 131 determinations included 27 different specialties. Table 15 shows the medical specialties in which there were two or more determinations

Table 15: Number of area of need determinations by type (where there are two or more determinations for one medical specialty) (at 14 December 2014).

	General medical services	Anaesthetics	Ear nose throat	Emergency	Intensive care	Obstetrics & gynaecology	Orthopaedic	Plastic surgery	Psychiatric	Radiology	RMO & registrars	Urology	Mixed specialties
2014	70	2	3	5	2	3	2	3	2	17	3	2	2

Note: There are an additional 15 determinations where there is one determination only for that medical speciality.

It should be noted that while determinations are indicative of workforce shortages, they do not provide information regarding the number of IMGs actually employed in those locations, e.g. a single GP services AoN determination covers all regional areas of WA (except for specific locations) while other determinations cover only one medical practice in one location.

In early 2014, the Department's *AoN Policy and Guidelines* were reviewed and streamlined to ensure that AoN was only granted in locations with significant and ongoing workforce shortages, and the Department could be responsive to changes in the labour market as more Australian-trained doctors enter the workforce. The following key changes were made to improve transparency and add rigor to the AoN assessment process:

- Proof of advertising in three appropriate forums is now required – each over a four week period in the six months prior to applying for AoN.
- RMO and registrar AoN applications must now provide evidence of workforce shortages, through proof of advertising and by documenting outcomes of advertising.

The increase in local medical graduates and the intent to achieve self-sufficiency by 2020 has also resulted in more rigorous assessment of AoN determinations; a number of earlier determinations pre-dating 1994 without expiry dates were repealed and replaced with two year determinations. In addition, a blanket determination for RMOs and registrars which expires in January 2015 will be replaced by:

- Individual RMO determinations at a hospital or health service level, to be assessed on a case-by-case basis.
- A one year determination for registrar services in public sector hospitals which will expire in February 2016. This workforce shortage will continue to be monitored.

An issue identified by medical services in WA is a lack of alignment between DWS and AoN; some practices with long-term difficulties in recruiting staff, particularly in outer metropolitan and rural and remote areas, such as Mandurah, are not located in an area that is considered a DWS. The national AoN – DWS Principal Committee Working Group is currently reviewing these issues. Alignment of the two processes, combined with a review of the methodology of determining DWS, has the potential to streamline processes so they meet and reflect both current and future medical workforce trends. In future, AoN is less likely to be used as a mechanism to solve maldistribution issues in specialties.

7.4 Junior Doctors Business Case

Since the COAG agreement of 2006, which resulted in Australian Government funded increases to the number of domestic medical students, there has been an increase in demand for supervised clinical education and training for junior doctors in their first few years of prevocational training. Junior doctor training is a critical aspect of workforce development; without adequate clinical education and training

supervised by more senior doctors (registrars and consultants), interns and residents are not able to meet professional and legal requirements to continue working as independent doctors.

In March 2011, the EERC approved the JDBC to support the training needs of the additional domestic medical graduates commencing work in WA's public health system[53]. The JDBC delivers $71.61 M over five years from 2010/11 to 2014/15 for the establishment of new positions/FTE above baseline funding adjustments. The JDBC funds additional intern and RMO positions, supervising doctor FTE[54] (registrars and consultants), and MEU and Simulated Learning Environment (SLE) positions; and provides a framework for junior doctor clinical training, education and supervision for the increasing number of medical graduates in WA from 2010.

JDBC resourcing is comprised of recurrent specific purpose funds (allocated annually across the different health services) and capital funds for SLEs in 2011/12. Quarterly reports summarising JDBC recurrent expenditure and the additional FTE consequently employed, by hospital site, are provided to OCMO by the health services. JDBC reporting requirements for 2013/14 were met by all health services.

At the close of 2013/14, health services had reported utilising $45.09M (or 92%) of the $49.25M in recurrent funds provided by the JDBC since 2010/11. Total JDBC recurrent expenditure since 2010/11 is included in Table 16.

Table 16: Total JDBC recurrent expenditure from 2010/11 to 2013/14 by health service

2010/11 – 2013/14	CAHS	NMHS	SMHS			WACHS	Total
			FH Group	RPH Group	SMHS Total		
Budget ($M)l	3.38	9.81	10.33	6.29	16.61	19.45	**49.25**
Expenditure ($M)	3.48	7.62	9.95	6.35	16.29	17.69	**45.09**
Utilisation rate (%)	103	78	96	101	98	91	**92**

It should be noted that in at least one financial year (2013/14), SMHS reported spending JDBC funds on overhead costs despite advice from OCMO that the funds were not to be utilised for that purpose. Without the inclusion of overhead costs, the level of underspending by SMHS would have been more significant.

Table 17: JDBC recurrent expenditure in 2013/14 by health services (excluding overhead costs)

2013/14	CAHS	NMHS	SMHS			WACHS	Total
			FH Group	RPH Group	SMHS Total		
Budget ($M)l	1.67	4.58	4.96	2.94	7.90	7.43	**21.59**
Staff employed (FTE)	10.4	19.5	27.7	11.7	39.4	44.8	**114.1**
Expenditure[#] ($M)	1.64	4.03	3.56	2.01	5.57	6.30	**17.54**
Utilisation rate (%)	98	88	72	68	71	85	**81**

[#] *Figures exclude $1.83M of site support costs allocated by SMHS against JDBC funds in 2013/14.*

During 2013/14, health services reported utilising $17.54M or 81% of the total JDBC allocation. Feedback from health services was that a number of factors had contributed to the 2013/14 underspend, including unfilled FTE, the WA public sector recruitment freeze, and the mismatch between the financial year and contract employment year. The JDBC FTE allocation in 2013/14 was 125; however, the actual

[53] 255 in 2010/11 to 304 in 2014/15

[54] The supervision FTE represent only supervision of junior doctors, and not service delivery.

FTE figure reported by AHS was 114.1, a shortfall of around 11 FTE. A breakdown of expenditure and FTE by resource type is included in Table 18.

Table 18: JDBC expenditure and FTE in 2013/14 by resource

Resource	Budget	FY Actual	Difference	% Difference
Junior Doctors				
Funding $ million	6.65	6.31	0.34	95%
FTE	61.6	52.2	9.37	85%
Supervising Doctors				
Funding $ million	5.91	3.64	2.27	62%
FTE	22.5	18.3	4.17	81%
Medical Education Units				
Funding $ million	6.50	5.42	1.08	83%
FTE	21.4	31.8	-10.39	149%
Simulated Learning Environments				
Funding $ million	2.52	2.17	0.36	86%
FTE	19.6	11.8	7.84	60%
Total				
Funding $ million	**21.59**	**17.54**	**4.04**	**81%**
FTE	**125.1**	**114.1**	**10.99**	**91%**

In 2013/14, the highest utilisation of JDBC funding was for junior doctor positions (95%); however, the highest FTE utilisation was for MEU positions. While the JDBC was designed to give health services flexibility in the way that they supported junior doctor training across hospital sites, analysis of the data indicates an imbalance in some health services between the number of junior doctor FTE and the number of MEU FTE funded by the JDBC, particularly administration staff and Medical Education Officers.

The initial five year specific funding allocation for the JDBC will finish in June 2015, and a final JDBC summary report will be developed based on the quarterly report information provided by health services since the commencement of the program. JDBC funds have been utilised to manage the increased numbers of domestic WA medical graduates by providing for internships, additional RMO and registrar posts for career progression, increased supervision and monitoring of junior doctors, and the establishment of sustainable MEUs.

The Department's Director of Budget Strategy has confirmed that the intention is for the JDBC to be rolled over into the Department's base funding from 2015/16 onward in acknowledgement of the ongoing increase in medical graduate numbers, and that funding will continue to be identified separately in health services Service Level Agreements beyond the 2014/15 financial year. The JDBC reporting process beyond 2014/15, and the continued participation of OCMO in JDBC reporting, is still to be determined.

8. Medical Workforce Priorities for 2014/15

Outcomes	Principles	Reform strategies
Implementation of OCAM	• To effectively influence specialist workforce planning in WA health services. • To address the over and under supply of consultants in some specialties.	• Increase consultant numbers from within existing budgets and current level of increase per annum. • Utilise FTE/funds from retiring specialist positions. • Communicate to achieve an agreed approach across health services.
Vocational training	• To effectively influence colleges to meet WA's future health service needs.	• Plan for suitable accredited training positions to address future workforce needs. • Develop alternative training pathways and dual training programs.
Service positions	• To coordinate service needs of health services with career planning of registrars.	• Further investigate the role of the service registrar. • Develop potential career and training pathways for: - Career medical officers; - IMGs; and - Trainees in waiting.
Influence early career choices of junior doctors	• To address the over and under supply in some specialties.	• Educate medical students and junior doctors on specialist workforce opportunities in collaboration with PCMWA e.g. develop specialty information sheets for junior doctors.

Address maldistribution in rural, remote and outer metropolitan areas	• To provide equitable access and distribution of medical services to those areas most in need.	• Investigate recruitment and retention challenges in the rural, remote and outer metropolitan areas. • Explore early training and career exposure opportunities to rural, remote and outer metropolitan areas. • Support increased generalist training pathways, including dual training opportunities.
Outcomes	**Principles**	**Reform strategies**
Strengthen the specialist workforce	• To provide a sustainable specialist workforce.	• Explore incentive opportunities through: - Models of employment; - Continued professional development; - Research opportunities; - Access to sabbaticals; and - Development of career pathways.
Ongoing support for the GMWP	• To provide appropriate direction for strengthening and increasing training capacity for the generalist medical workforce.	• Ensure generalist medical workforce initiatives are at the forefront of medical workforce planning.
Ongoing support for WBA	• To provide opportunities for suitable IMGs to achieve general registration with the MBA.	• Expand and continue the program in WA.
Ongoing support for the AoN program	• To provide a mechanism supporting recruitment of IMGs to areas that demonstrates a workforce shortage.	• Work for consistency between AoN and DWS programs. • Streamline AoN approval pathway.
Investigate centres of excellence (academic and research) in WA and consider how they can be nurtured	• To continue advocacy for further centres of academic and research excellence.	• Identify potential opportunities.
Support completion of the JDBC	• To ensure additional funding is directed to purpose for which it received government approval.	• Complete reporting and evaluation processes with health services.

Maximise ABF/M funding	• To allow for an optimal specialist workforce.	• Identify strategies to improve health service practises. • Review other states and territories.
Acknowledge and consider the changing lifestyle needs of the medical workforce	• To provide increased flexibility in the vocational training and career pathway.	• Identify strategies to improve attraction and retention of LTFT vocational trainees and part-time consultants.

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- Carmen Condon, Senior Program Officer
- Rachel Howden, Program Officer

10. Acronyms

ABF/M	Activity Based Funding / Management
ACEM	Australasian College for Emergency Medicine
AHPRA	Australian Health Practitioner Regulation Agency
AHS	Armadale Health Service
AM	Adult Medicine
AMC	Australian Medical Council
AN-SNAP	Australian National-Subacute and Non-Acute Patient (code)
AoN	Area of Need
AR-DRG	Australian Refined – Diagnosis Related Groups (inpatient code)
CAHS	Child and Adolescent Health Service
COAG	Council of Australian Governments
CRP	Community Residency Program (formerly the PGPPP)
CSF	WA Health Clinical Services Framework 2010-2020
DCIM	Demand Capacity Inpatient Model
DRG	Diagnosis related groups
DWS	District of Workforce Shortage
EERC	Economic and Expenditure Reform Committee, Department of the Premier and Cabinet
ENT	Ear, Nose and Throat
FHHS	Fremantle Hospital and Health Service
FSH	Fiona Stanley Hospital
FTE	Full-Time Equivalent
GMWP	Generalist Medical Workforce Program
GP	General Practitioner/General Practice
GST	Goods and Services Tax
HWA	Health Workforce Australia
HR	Human Resources
IHPA	Independent Hospital Pricing Authority
IMG	International Medical Graduate
JDBC	Junior Doctors' Business Case
JHC	Joondalup Health Campus
KEMH	King Edward Memorial Hospital
LTFT	Less than full time
MBA	Medical Board of Australia
MBS	Medical Benefits Schedule
MEU	Medical Education Units
MTRP	Medical Training and Review Panel
MWB	Medical Workforce Branch
NEP	National Efficient Price
NHRA	National Health Reform Agreement
NMHS	North Metropolitan Health Service
NSW	New South Wales
OCAM	Optimal Consultant Allocation Model
OCMO	Office of the Chief Medical Officer
PAF	Performance and Accountability Framework

PGPPP	Prevocational General Practice Placements Program
PGY1	Post Graduate Year 1 (intern)
PGY2	Post Graduate Year 2 (first year resident medical officer)
PGY2+	A Resident Medical Officer in their second or subsequent postgraduate year.
PMH	Princess Margaret Hospital
PMCWA	Postgraduate Medical Council Western Australia
RACP	Royal Australasian College of Physicians
RACS	Royal Australasian College of Surgeons
RAP	Resourcing and Performance Division
RCPA	Royal College of Pathologists Australia
RCSWA	Rural Clinical School of Western Australia
RGH	Rockingham General Hospital
RHW	Rural Health West
RPH	Royal Perth Hospital
RMO	Resident Medical Officer
SCGH	Sir Charles Gairdner Hospital
SDH	Swan Districts Hospital
SLE	Simulated Learning Environment
SMHS	South Metropolitan Health Service
SPO	Senior Project Officer
SPR	Specialist to Population Ratio
STP	Specialist Training Program
SWCP	Specialist Workforce Capacity Program
URG	Urgency Related Groups (emergency triage code)
VMPs	Visiting Medical Practitioners
WAB	Weighted Activity Based (demand model)
WACHS	Western Australia Country Health Service
WBA	Workforce Based Assessment

11. Definitions

Area of Need	AoN is a mechanism by which medical practices in WA in locations with proven medical workforce shortages can employ IMGs under limited registration with the MBA. The AoN determination process in WA is coordinated by MWB.
College	A speciality college responsible for the determination and maintenance of standards for its discipline, and for the training and education of medical specialists in that discipline.
Consultant	A specialist medical practitioner who is employed as a consultant. Consultants have a 1:4 split between supervision and service delivery
Consultant workforce	Consultants who are employed and practicing in WA.
The Department	The Western Australian Department of Health.
GMWP	Generalist Medical Workforce Program: A program supported by MWB that aims to strengthen the general workforce in WA.
Generalist workforce	Specialist medical practitioners whose primary vocation is general medicine, general surgery, paediatric medicine or general practice.
Health services	South Metropolitan Health Service, North Metropolitan Health Service, WA Country Health Service and the Child and Adolescent Health Service.
Intern	A medical practitioner undertaking their first year of post-graduate training (PGY1) prior to receiving their general registration from the MBA. Interns have a 4:1 split between training and service delivery.
Junior doctors	Interns and RMOs.
JDBC	Junior Doctor's Business Case: A specific purpose fund for the establishment of new junior doctor and supervising positions above baseline funding adjustments (recurrent operational funding) to support the training of increased number of medical graduates in WA. Health services JDBC reporting is completed through MWB.
Medical graduate	An individual who has graduated from medical school in a particular year.
Medical workforce	Medical practitioners who are employed and practicing in WA, including, but not limited to, interns, RMOs, registrars and consultants.
Metropolitan	The area in and around central Perth, including the Western, inner Northern, inner Southern and inner Eastern suburbs. The metropolitan area is generally well serviced by medical practitioners, and is the location of most of WA's tertiary hospitals. Metropolitan public sector hospitals include Fiona Stanley Hospital, Fremantle Hospital and Health Service, Graylands Hospital (Tertiary Mental Health Service for Western Australia), King Edward Memorial Hospital, Princess Margaret Hospital, Royal Perth Hospital and Sir Charles Gardiner Hospital.
OCAM	Optimal Consultant Allocation Model: An allocation model that has been developed by MWB to directly address projected consultant shortfalls in the public sector, within existing health service budget allocation.
Outer metropolitan	Perth's outer suburbs. Outer metropolitan areas are serviced by general hospitals and may have some difficulty in attracting and retaining medical practitioners. Outer metropolitan public sector hospitals include Armadale Kelmscott Memorial Hospital, Bentley Hospital, Kalamunda Hospital, Joondalup Health Campus, Osborne Park Hospital,, Rockingham General Hospital (includes Murray Hospital) and Swan Districts Hospital.

Prevocational trainee	A junior doctor not yet part of a vocational training program or occupying a non-vocational registrar position.
Registrar	A registered medical practitioner who is employed as a registrar. Registrars may be vocational trainees or providing a service. Vocational trainee registrars (and senior registrars) are on the specialist training pathway and split their time between supervision of junior doctors and service delivery. Other registrars provide service delivery only: some are waiting for acceptance into a vocational training program (short-term), some are IMGs with limited registration (short term), and others may have chosen provide long term service rather than enter the specialist training pathway.
Resident Medical Officer	A registered medical practitioner employed as a RMO in post graduate training (PG2+) who is not performing the duties of a registrar. RMOs have a 1:1 split between training and service delivery.
Rural and remote	Regional, rural and remote locations, including inner regional areas such as Mandurah. Rural and remote areas often have difficulty in attracting and retaining medical practitioners. Most rural and remote locations fall under the auspices of WACHS and are serviced by six regional resource centres based at the regional hospitals in Albany, Broome, Bunbury, Geraldton, Kalgoorlie and Port Hedland.
Specialist	A medical practitioner who has received their fellowship from an Australian specialty college, and has specialist registration with the MBA.
Specialist training pathway	The training pathway from vocational trainee (registrar) to consultant.
Specialist workforce	Registrars and consultants who are employed in a speciality discipline in WA. Please note that GPs are excluded from discussion about the specialist workforce in this document as they do not fall under the auspices of the Department.
Specialty	A medical discipline formally recognised by the MBA. 45 specialties have been included in SWCP 2013.
Sub-specialty	A narrow field of specialisation within a particular specialty.
Specialty workforce	The consultant workforce of a specific specialty.
SWCP	Specialist Workforce Capacity Program: A biennial program undertaken by MWB that maps and analyses the specialist workforce to identify those specialties at risk of shortfall. The SWCP supports the development of targeted interventions for identified specialties.
Vocational trainee	A medical practitioner (registrar).that is undertraining training with a specialty college(s) to attain fellowship of that college(s).
WA Health	The WA public health sector, including all public health services and hospitals.
WBA	Workplace-based assessment: An alternative pathway to sitting the AMC clinical examination for IMGs on the standard pathway. The WBA program in WA is 12 months in duration and is coordinated by MWB.

12. Appendices

1. Registrars on public payroll by specialty as at 30th September 2013

	Limited Registration					Total
	Area of Need	PG Tern or SP	Teaching or Research	Sub-total		
				n	%	
Addiction Medicine						2
Anaesthesia	1	29	0	30	20%	143
Cardiology	2	3	0	5	19%	23
Cardiothoracic Surgery	1	2	0	3	33%	8
Dental	0	0	0	0	0%	10
Dermatology	0	0	0	0	0%	7
Emergency Medicine	18	7	0	25	17%	135
Endocrinology	1	0	1	2	15%	11
ENT Surgery	1	3	0	4	21%	16
Gastroenterology	2	1	0	3	16%	18
General Medicine	12	1	0	13	14%	76
General Practice	0	0	0	0	0%	1
General Surgery	7	9	0	16	14%	107
Geriatric Medicine	4	0	0	4	13%	25
Haematology	0	1	0	1	6%	19
Immunology	0	1	0	1	14%	8
Infectious Diseases	1	0	0	1	20%	4
Intensive Care	11	1	0	12	23%	46
Leave Relief	12	2	0	14	12%	78
Medical Administration						1
Medical Education						8
Medical Oncology	0	0	0	0	0%	12
Neonatal Medicine	5	6	0	11	50%	15
Nephrology	0	1	0	1	13%	9
Neurology	0	1	0	1	6%	11
Neurosurgery	0	5	0	5	28%	8
Obstetrics and Gynaecology	4	1	0	5	12%	41
Ophthalmology	0	7	0	7	39%	17
Orthopaedic Surgery	0	3	0	3	7%	36
Other	12	9	0	21	22%	66
Paediatric Medicine	3	4	0	7	19%	39
Paediatric Cardiology	0	1	0	1	100%	4
Paediatric Emergency Medicine	0	0	0	0	0%	18
Paediatric Infectious Diseases						0
Paediatric Intensive Care						4
Paediatric Medical Oncology						2
Paediatric Neonatal Rotations						0
Paediatric Neonatology						7
Paediatric Nephrology						0
Paediatric Neurology						7
Paediatric Ophthalmology	0	1	0	1	100%	1
Paediatric Psychiatry	0	0	0	0	0%	4
Paediatric Rehabilitation	0	0	0	0	0%	1
Paediatric Respiratory	1	0	0	1	50%	2
Paediatric Surgery	0	2	0	2	67%	2
Pain Medicine	0	1	0	1	17%	5
Palliative Care	3	0	0	3	23%	12
Pathology	0	1	0	1	5%	8
Plastic Surgery	2	3	0	5	24%	19
Psychiatry	11	1	0	12	10%	71
Public Health	0	0	0	0	0%	2
Radiation Oncology						9
Radiology	1	10	0	11	16%	52
Rehabilitation Medicine	1	0	0	1	4%	20
Respiratory and Sleep Medicine	1	0	0	1	8%	11
Rheumatology	0	0	0	0	0%	2
Sexual Health	0	1	0	1	33%	3
Unallocated	3	0	0	3	23%	12
Urology	0	3	0	3	21%	11
Vascular Surgery	1	2	0	3	43%	6
Fellow Other						11
TOTAL	**121**	**123**	**1**	**245**		**1306**

2. Change in medical specialist headcounts 2011-2013

Specialty	2011	Retained	New	Loss	Loss by type				2013
					Retired	Interstate	Overseas	Other	
Anaesthesia	388	357	62	31	9	12	4	6	419
Cardiology	71	69	8	2	2	0	0	0	77
Cardiothoracic Surgery	11	9	2	2	0	0	0	2	11
Clinical Genetics	7	5	2	2	0	0	0	2	7
Dermatology	31	29	2	2	0	0	1	1	31
Emergency Medicine	149	130	33	19	1	6	1	11	163
Endocrinology	31	31	11	0	0	0	0	0	42
ENT Surgery	41	33	5	8	2	1	1	4	38
Gastroenterology	62	56	4	6	0	3	1	2	60
General Medicine	59	46	51	13	5	1	0	7	97
General Surgery	95	84	27	11	9	0	2	0	111
Geriatric Medicine	47	42	16	5	2	0	0	3	58
Haematology	27	26	5	1	1	0	0	0	31
Immunology	19	18	6	1	0	0	0	0	24
Infectious Diseases	14	13	10	1	1	0	0	0	23
Intensive Care Medicine	41	38	14	3	1	0	1	1	52
Medical Administration	23	20	6	3	3	0	0	0	26
Medical Oncology	31	30	6	1	0	0	1	0	36
Neonatal Medicine	20	18	3	2	2	0	0	0	21
Nephrology	29	27	6	2	1	0	1	0	33
Neurology	34	33	6	1	0	0	0	1	39
Neurosurgery	20	15	1	5	2	0	0	3	16
Obstetrics & Gynaecology	134	108	13	26	15	2	0	9	121
Ophthalmology	68	64	2	4	3	0	0	1	66
Orthopaedic Surgery	95	84	12	11	9	0	1	1	96
Paediatric Medicine	92	84	28	8	1	2	0	5	112
Paediatric Surgery	7	7	1	0	0	0	0	0	8
Palliative Medicine	17	16	3	1	0	0	0	1	19
Pathology	111	103	38	8	2	2	0	4	141
Plastic Surgery	41	40	5	1	1	0	0	0	45
Psychiatry	226	206	40	20	7	5	3	5	246
Public Health	12	10	6	2	0	1	0	1	16
Radiation Oncology	15	15	2	0	0	0	0	0	17
Radiology	158	150	69	8	3	2	2	1	219
Rehabilitation Medicine	12	5	2	7	0	0	0	7	7
Respiratory & Sleep Medicine	50	46	7	4	3	0	1	0	53
Rheumatology	28	25	6	3	1	0	1	1	31
Sexual Health	4	2	1	2	1	1	0	0	3
Urology	33	30	3	3	3	0	0	0	33
Vascular Surgery	18	12	2	6	1	0	1	4	14
New Specialties									
Addiction Medicine									11
Clinical Pharmacology									1
Occupational & Environmental Medicine									33
Pain Medicine									23
Sports & Exercise Medicine									9
Total (excluding new specialties)	**2,371**	**2,136**	**526**	**235**	**91**	**38**	**22**	**84**	**2662**
Total (including new specialties)									**2739**

3. Consultant loss rates for medium and high volume specialties 2011-2013

Specialty	N	Total Loss Rate (%)	Retiree Loss Rate (%)	Migration Loss Rate (%)	Other Loss Rate (%)
Anaesthesia	388	7.99	2.32	4.12	1.55
Cardiology	71	2.82	2.82	0	0
Dermatology	31	6.45	0	3.23	3.23
Emergency Medicine	149	12.75	0.67	4.70	7.38
Endocrinology	31	0	0	0	0
ENT Surgery	41	19.51	4.25	4.88	9.76
Gastroenterology	62	9.68	0	6.45	3.23
General Medicine	59	22.03	8.47	1.69	11.86
General Surgery	95	11.58	9.47	2.11	0
Geriatric Medicine	47	10.64	4.26	0	6.38
Intensive Care Medicine	41	7.31	2.44	2.44	2.44
Medical Oncology	31	3.23	0	3.23	0
Neurology	34	2.94	0	0	2.94
Obstetrics & Gynaecology	134	19.40	11.19	1.49	6.72
Ophthalmology	68	5.88	4.41	0	1.47
Orthopaedic Surgery	95	11.58	9.47	1.05	1.05
Paediatric Medicine	92	8.70	1.09	2.17	5.43
Pathology	111	7.21	1.80	1.80	3.60
Plastic Surgery	41	2.44	2.44	0	0
Psychiatry	226	8.85	3.10	3.54	2.21
Radiology	158	5.06	1.90	2.53	0.63
Respiratory & Sleep Medicine	50	8.00	6.00	2.00	0
Urology	33	9.09	9.09	0	0

4. Optimal and problematic consultant age distributions

When projecting supply and demand of consultants, a retirement age of 65 years has been used for all specialties; however, evidence suggests that surgical consultants retire from practice at a significantly younger age than clinical or laboratory focussed consultants (with the notable exception being emergency medicine). The SWCP 2013 data confirms this trend.

Distribution Definitions

Symmetrical distribution: A symmetrical distribution is a distribution where the upper and lower tails are a mirror image of each other, such as a normal distribution. A uniform distribution is a symmetrical distribution which is rectangular in shape.

Skewed distribution: A skewed distribution is a non-symmetrical distribution. A positively skewed distribution has a peak to the left of middle with a longer tail to the right. A negatively skewed distribution has a peak to the right of middle with a longer tail to the left.

Bimodal distribution: A bimodal distribution is a distribution where there are two separate normally distributed populations within the data (two peaks).

Kurtosis: Kurtosis is a measure of the height of a distribution (peak) relative to the width (dispersion) when compared to a normal (0, 1) distribution.

- Platykurtosis describes a distribution with a low peak and a broad width.
- Mesokurtosis describes a distribution with a normal peak and width.
- Leptokurtosis describes a distribution with a high peak and narrow width.

Measures of central tendency: The mean (average) is an unbiased estimator for a symmetric distribution and a biased estimator for any skewed distribution. The median (middle value) is an unbiased estimator for both a symmetrical and skewed distribution. For any skewed distribution the median is the best (unbiased) statistical measure of central tendency.

An optimal consultant age distribution

The optimal consultant workforce has an age distribution that is smooth and positively skewed with a peak (median) age near 47 or 48 years. For a small volume consultant workforce (<15 personnel), a uniform distribution is an ideal age distribution; however, for a larger volume consultant workforce, a symmetrical distribution is in danger of becoming an “ageing workforce”. The correct definition of an “ageing workforce” is a workforce depleted of young entrants (a negatively skewed distribution).

Depending on specific specialty, the distribution can be adjusted up (clinical or laboratory oriented specialty) or down (surgical specialty or emergency medicine) by no more than about 4 years. For surgical consultants (and emergency medicine) the targeted optimal median age is about 44 or 45 years and for non-surgical specialties at most 51 or 52 years of age (preferably below).

Within any 10 year cycle newly qualified consultants usually enter the distribution and occupy the lower 25% of the consultant age distribution (lower quartile). The upper 25% of the distribution (upper quartile) represents the consultants most likely to retire during the next 10 year period. Movements in and out of the age distribution between these quartiles receive little attention as their impact is usually minimal in workforce planning applications. The median and upper quartiles of the consultant age distribution are the most important statistics to consider in workforce planning.

The average is a biased measure of central tendency for any non-symmetrical distribution. The incorrect use of the average in medical workforce analysis is largely responsible for overuse of the term an “ageing medical workforce”.

In summary, the optimal age distribution of the consultant workforce is (relative to the total number in the specialty):

- A smooth age distribution density curve.
- A positively skewed distribution (or a uniform distribution for very small volume specialties).
- A median age ≤ 48 years for surgical specialties and emergency medicine.
- A median age ≤ 52 years for clinical specialties.
- A supply of consultants marginally greater than demand for consultants.

Problematic consultant age distributions

An age distribution indicating leptokurtosis has the most severe impact on workforce. This occurs when a high proportion of the consultant workforce is contained within a narrow age range, usually in a low volume workforce. A high proportion of the current workforce will retire in rapid succession and deplete the workforce.

The second most serious concern is a strongly bimodal age distribution with a significant trough or depression (i.e. few personnel within a particular age interval usually towards the middle of the distribution). The trough often creates a significant shortage for a lengthy period of time when it reaches retirement age. However, once the trough has passed, the problem is resolved providing there is a continuous flow of newly qualified (young) consultants.

The impact of a strongly negatively skewed distribution (a true “ageing population”) should be considered next, where an insufficient number of younger consultants enter the workforce to replace retirements (and the natural increase in demand over time). A problematic age distribution of a consultant workforce is:

- A distribution containing a major “trough” either a strongly bimodal age distribution or a distribution displaying leptokurtosis.
- A negatively skewed age distribution (a true aging workforce).
- A supply of consultants significantly less than demand.

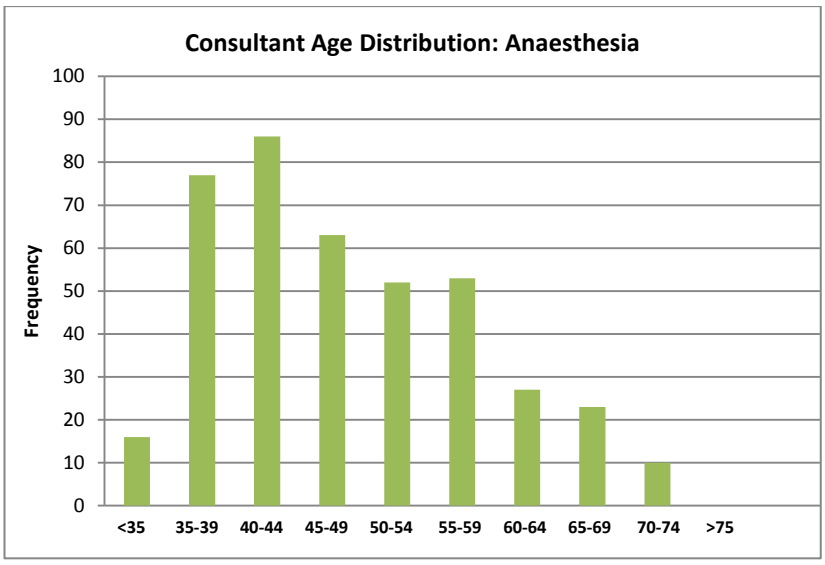
Summary

The only difference between the age distributions of the WA consultant workforce now compared to a few decades ago is a larger proportion of personnel working beyond 65 years of age. A small peak at the upper tail of the distribution is inconsequential. There are only a few specialties that could be described as an “ageing medical workforce” in WA. They are easily identified as a negatively skewed consultant age distribution. A negatively skewed distribution is formed by an insufficient number of younger consultants entering the workforce over a prolonged period of time.

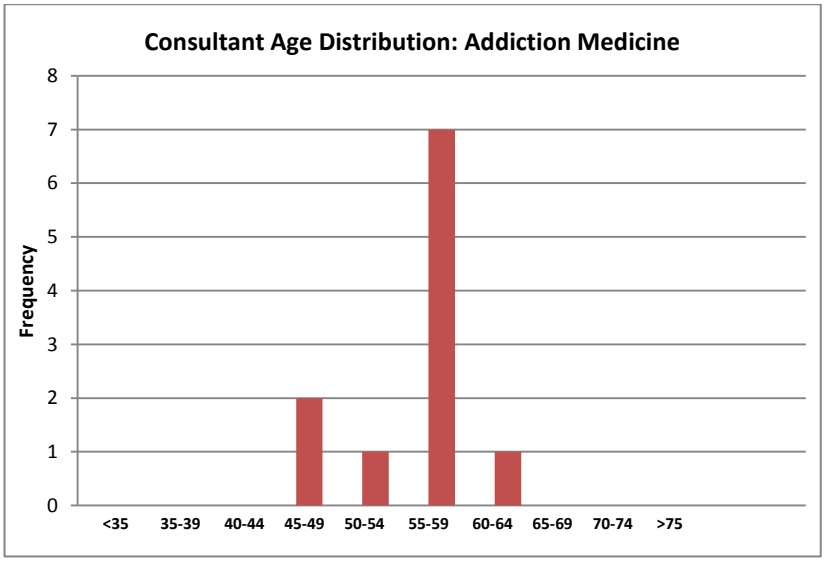
5. Consultant age profile by specialty 2013

Specialty	N	Mean Age	Median Age Q2	Q3 (Upper quartile)	P90 (90th percentile)	% > 65 years
Addiction Medicine	11	54.55	55	58	59	0.00
Anaesthesia	419	48.21	47	56	63	8.11
Cardiology	77	50.33	48	59	65	12.00
Cardiothoracic Surgery	11	45.92	52	57	57	9.09
Clinical Genetics	7	48.00	48	56		0.00
Clinical Pharmacology	1	60.00	60	60		0.00
Dermatology	31	50.55	51	57	63	6.45
Emergency Medicine	162	40.43	44	50	54	1.25
Endocrinology	42	48.27	47	56	67	11.90
ENT Surgery	38	49.39	45	57	67	15.79
Gastroenterology	60	49.5	50	57	61	6.67
General Medicine	97	41.37	46	57	63	7.69
General Surgery	111	50.94	50	56	65	11.32
Geriatric Medicine	58	46.10	44	53	61	6.90
Haematology	31	53.40	52	63	70	22.58
Immunology	24	48.83	46	57	66	16.67
Infectious Disease	23	45.74	46	49	54	0.00
Intensive Care Medicine	52	48.67	46	55	64	5.77
Medical Administration	26	56.92	58	65	73	26.92
Medical Oncology	36	47.97	47	55	62	0.00
Neonatal Medicine	21	48.86	46	56	64	4.76
Nephrology	33	48.42	46	55	66	12.12
Neurology	39	51.03	53	57	64	7.69
Neurosurgery	16	50.19	51	58	62	6.35
Obstetrics & Gynaecology	121	49.21	48	54	63	6.61
Occupational & Environmental Health	33	57.70	60	66	72	36.36
Ophthalmology	66	51.24	50	57	67	10.61
Orthopaedic Surgery	96	48.91	47	56	60	3.13
Paediatric Medicine	111	42.61	47	57	61	7.34
Paediatric Surgery	8	49.75	50	55		0.00
Pain Medicine	23	51.22	49	60	64	8.70
Palliative Care Medicine	19	46.84	44	56	66	10.53
Pathology	141	42.43	50	56	64	9.22
Plastic Surgery	45	49.38	46	55	62	8.89
Public Health	15	47.40	46	54	57	0.00
Psychiatry	246	51.60	51	58	64	8.94
Radiation Oncology	17	49.69	50	57	59	6.25
Radiology	219	42.57	47	56	65	10.95
Rehabilitation Medicine	7	51.43	52	55		14.29
Respiratory & Sleep Medicine	53	50.89	49	61	67	15.09
Rheumatology	31	53.84	55	64	68	22.58
Sexual Health	3	48.67	44	60		0.00
Sport & Exercise Medicine	9	50.00	52	55		0.00
Urology	33	45.71	46	51	59	3.03
Vascular Surgery	14	49.29	46	56	60	7.14

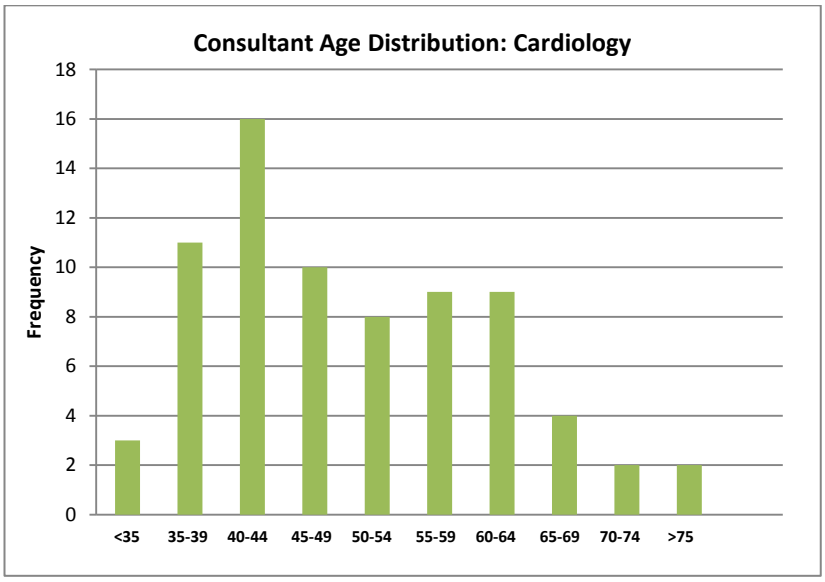
6. Consultant age distribution by specialty 2013



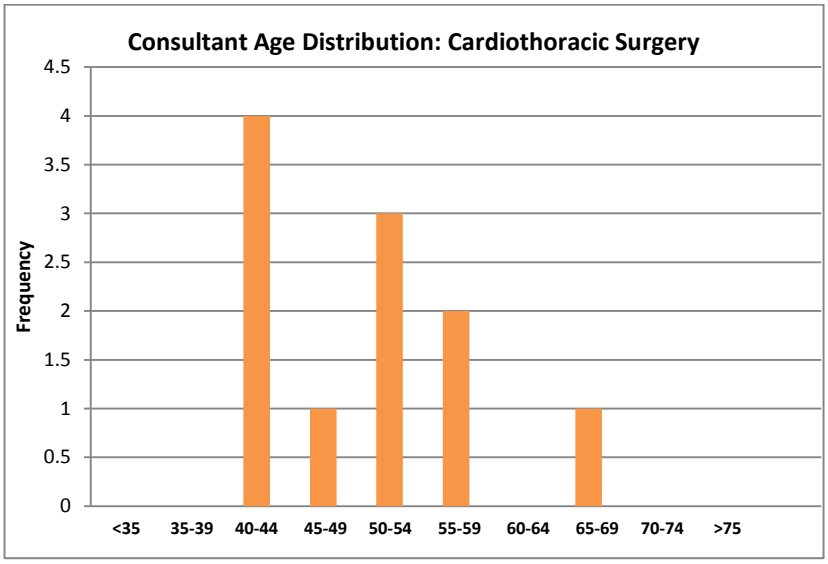
Anaesthesia: A positively skewed, mesokurtotic distribution. Median age is 47 years.



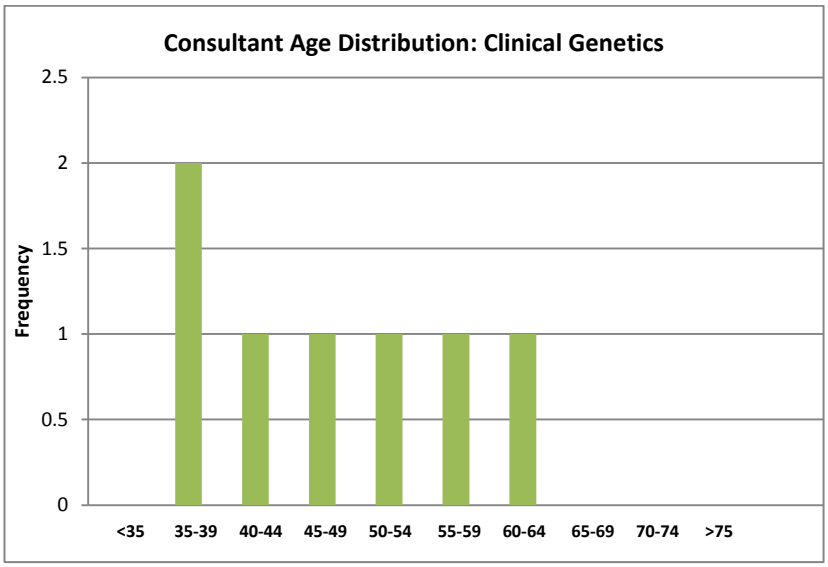
Addiction Medicine: A strongly leptokurtotic distribution requiring urgent immediate attention. More than half the workforce (7 of 11) is in the same 5 year age group (and likely to retire in quick succession in the future). It is a more serious situation than the graph indicates with an age range of only 13 years for all 11 consultants (aged 47 to 60 years). Median age is 55 years (well above the optimal age target).



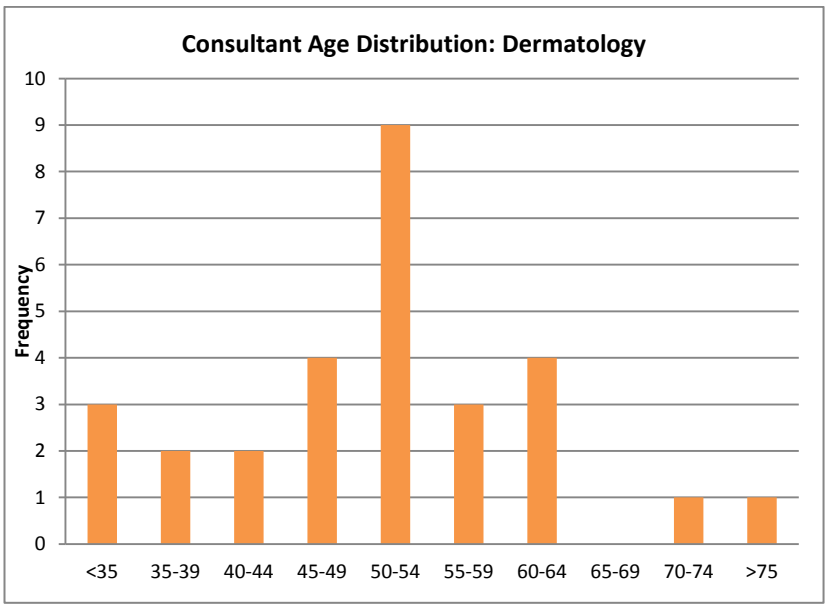
Cardiology: A positively skewed, mesokurtotic distribution. Median age is 47 years.



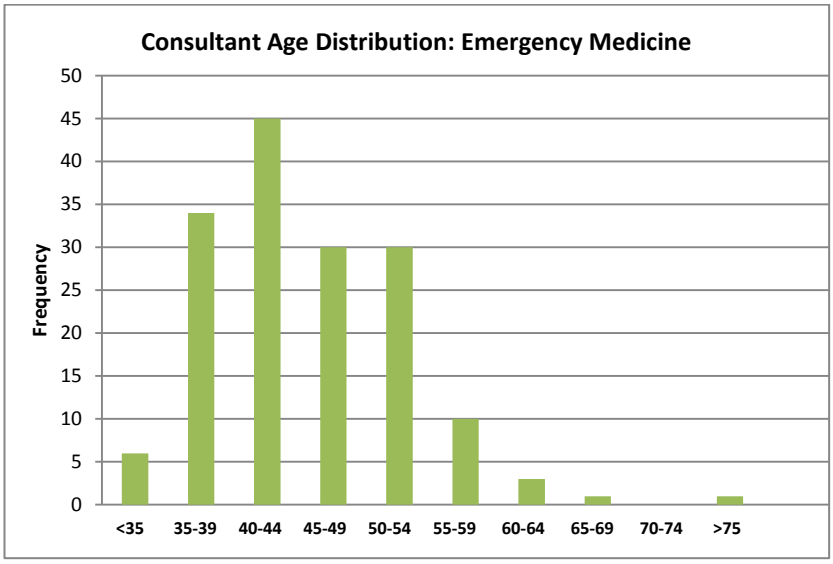
Cardiothoracic Surgery: A positively skewed, mesokurtotic distribution. Urgently require younger (newly qualified) consultants to enter the workforce. Median age is 52 years (well above the optimal age target for a surgical specialty).



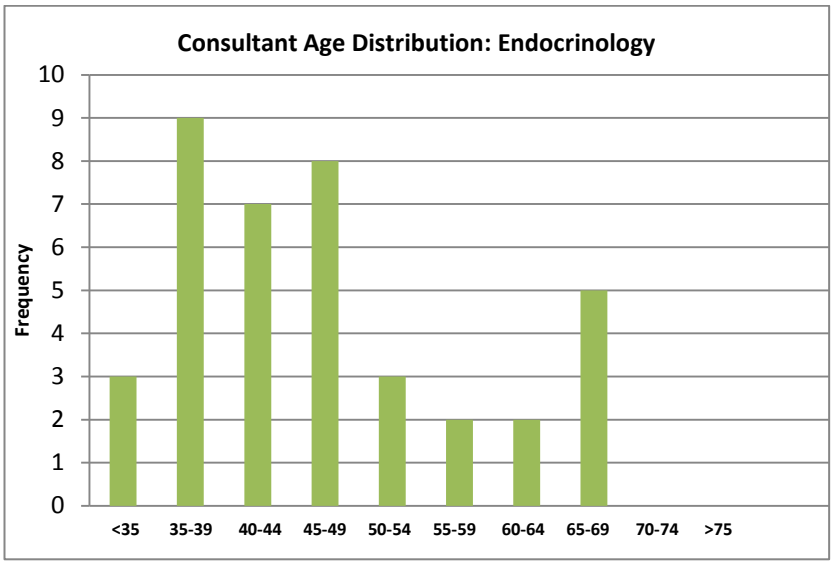
Clinical Genetics: A uniform, platykurtotic distribution. Small volume specialty with an ideal age spread. Median age is 48 years.



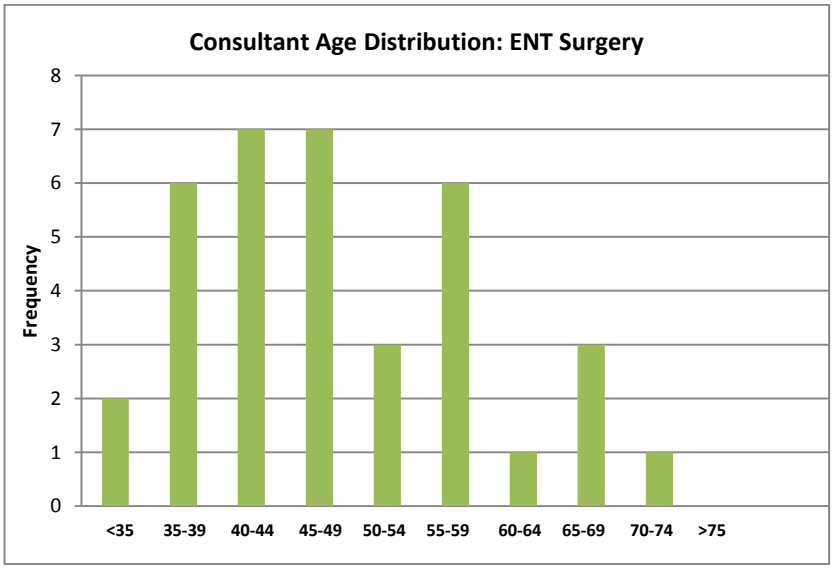
Dermatology: A roughly symmetrical, mesokurtotic distribution. Distribution requires entry of younger consultants to replace the current large cohort in the 50-54 age group and personnel over 55 years of age approaching retirement. Median age is 51 years.



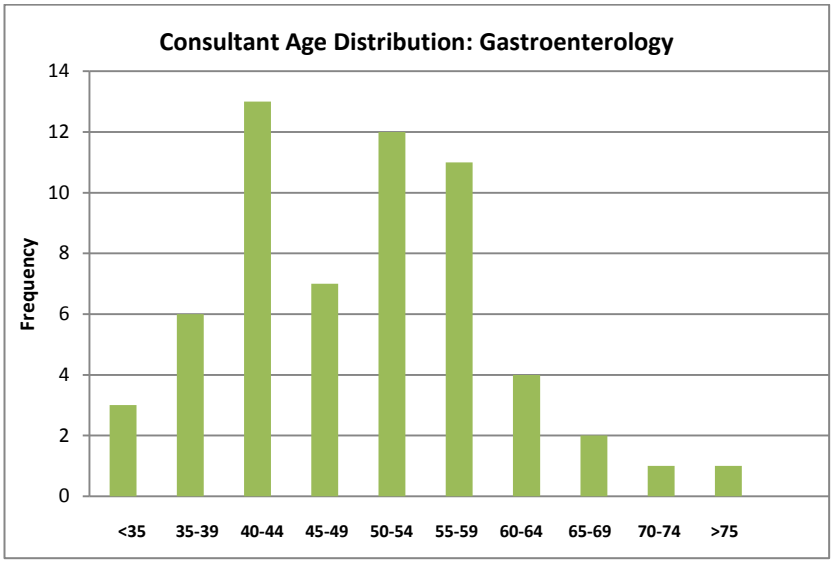
Emergency Medicine: A positively skewed, mesokurtoic distribution. Median age is 44 years.



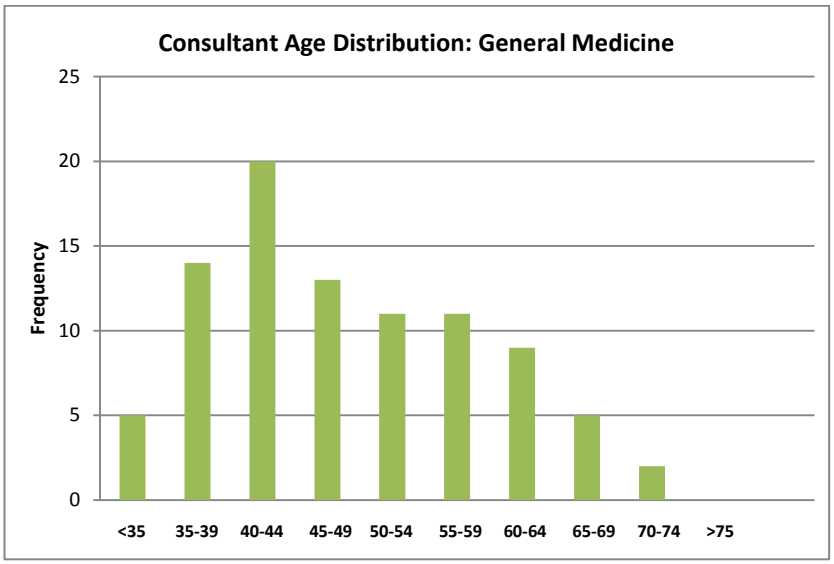
Endocrinology: A positively skewed, mesokurtotic distribution. Median age is 47 years.



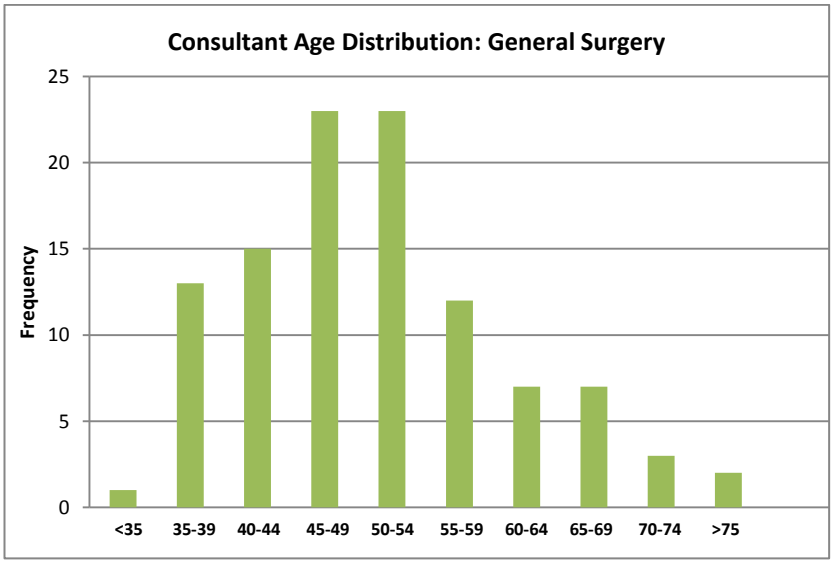
ENT Surgery: A positively skewed, mesokurtotic distribution. Median age is 45 years.



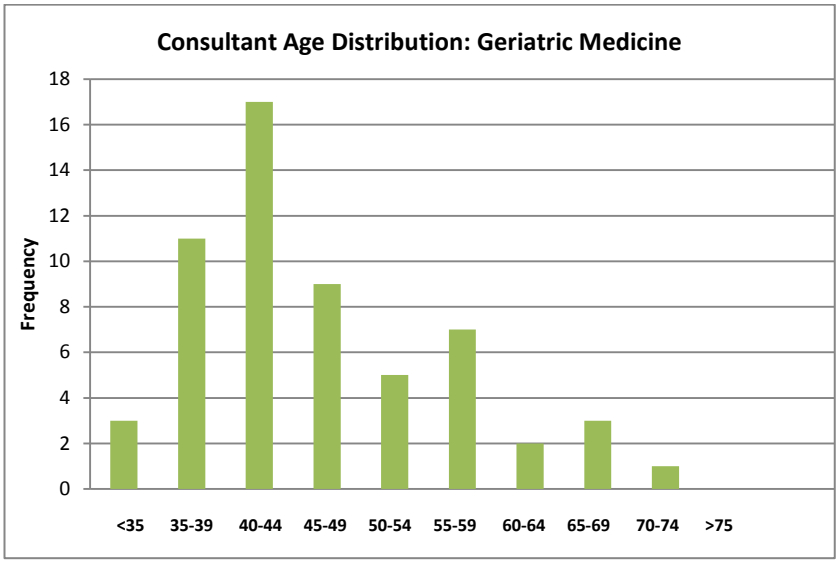
Gastroenterology: A positively skewed, mesokurtotic distribution. A significant proportion of the workforce is expected to retire over the next decade. Median age is 50 years.



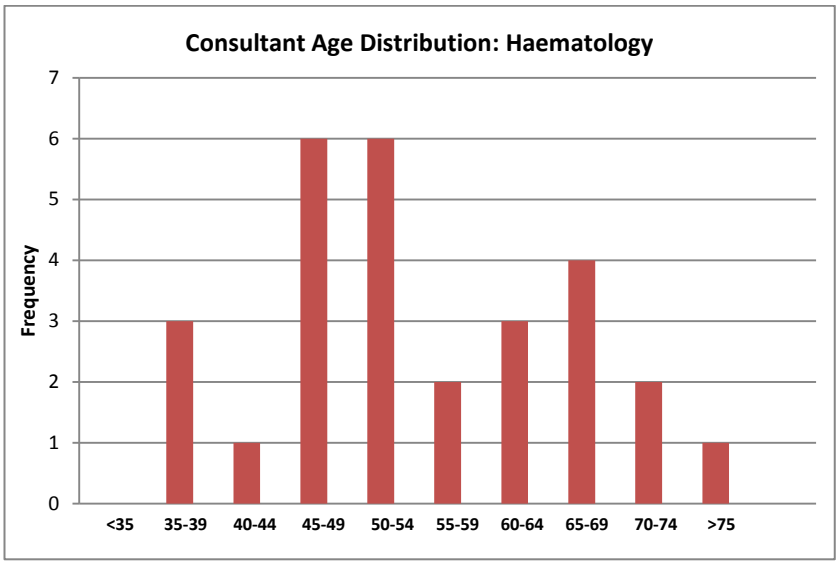
General Medicine: A positively skewed, mesokurtotic distribution. A significant proportion of the workforce is expected to retire over the next decade. Median age is 46 years.



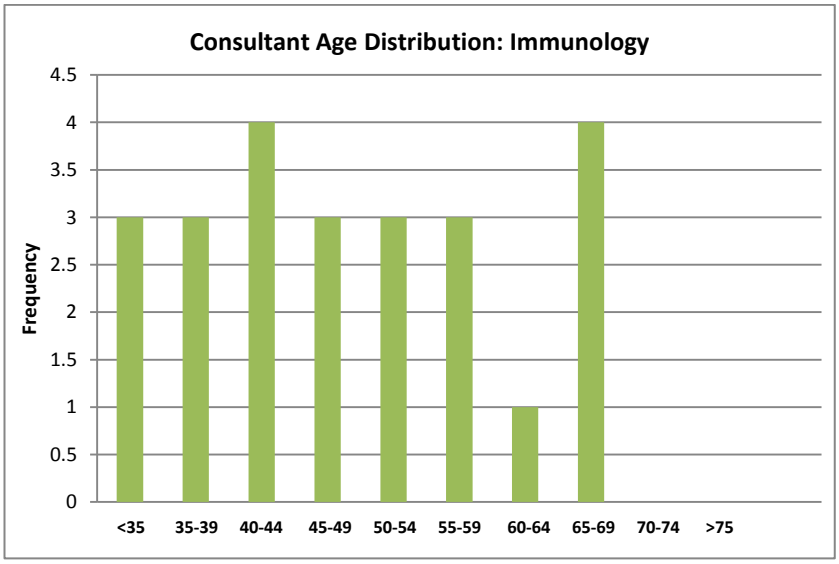
General Surgery: A positively skewed, mesokurtotic distribution. Median age is 50 years (above the optimal age target for a surgical specialty).



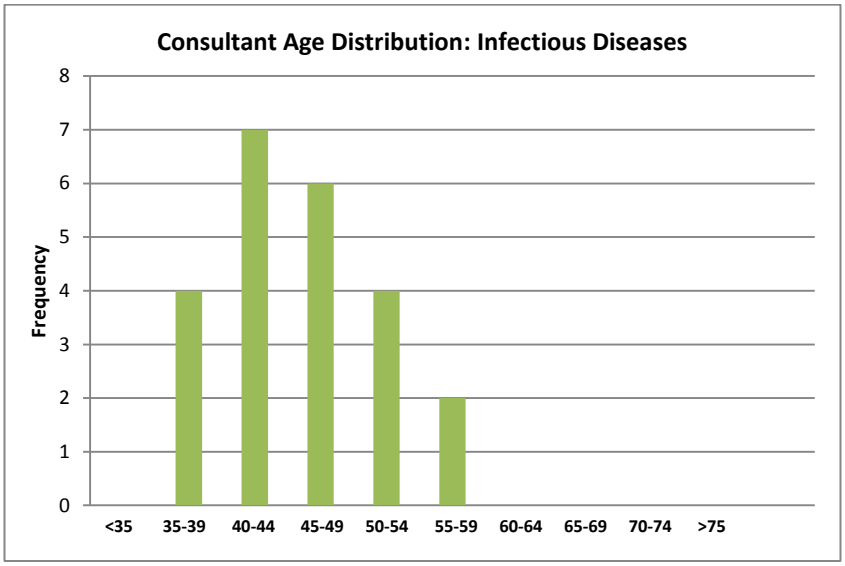
Geriatric Medicine: A positively skewed, mesokurtotic distribution. Median age is 44 years.



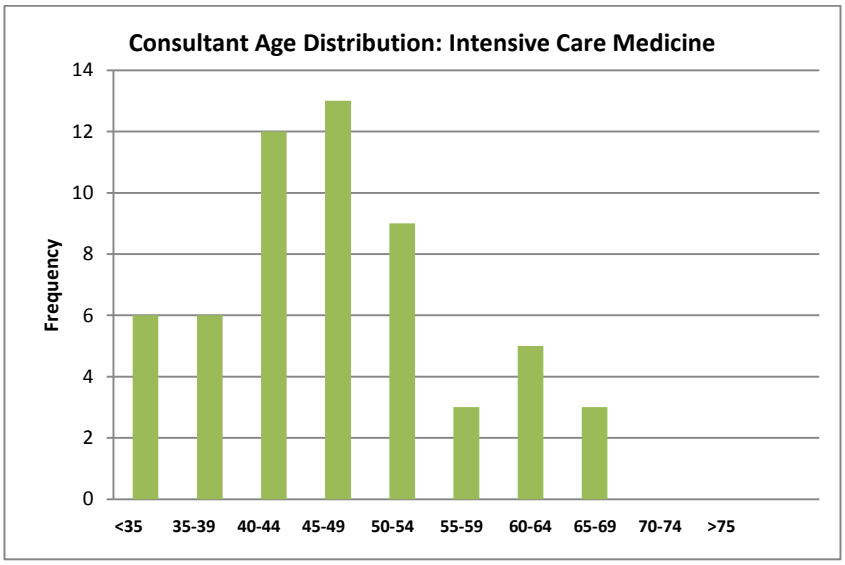
Haematology: Not a smooth distribution and a strongly bimodal, mesokurtotic distribution. This is an aging workforce distribution requiring urgent attention. Require entry of more newly qualified consultants to replace approaching retirements. A significant proportion of the workforce is expected to retire over the next decade. Median age is 52 years.



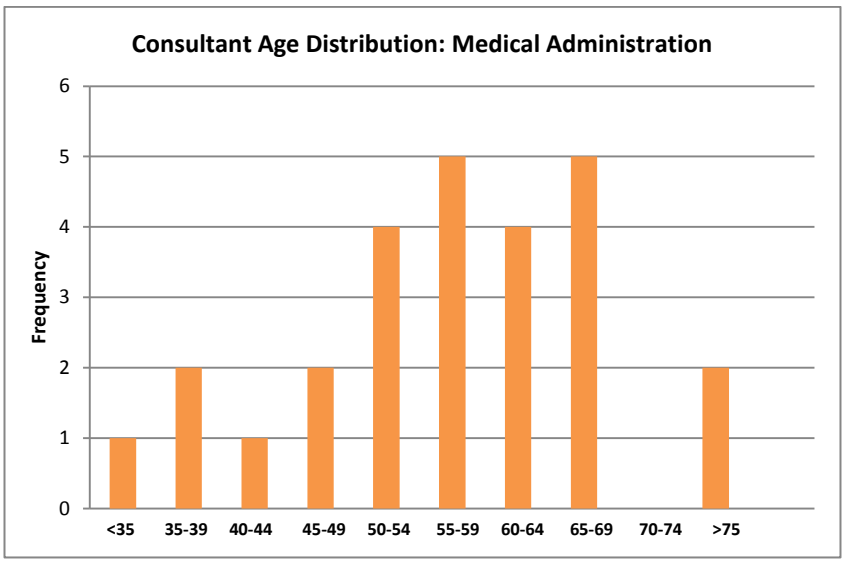
Immunology: A uniform, platykurtotic distribution. Median age is 46 years.



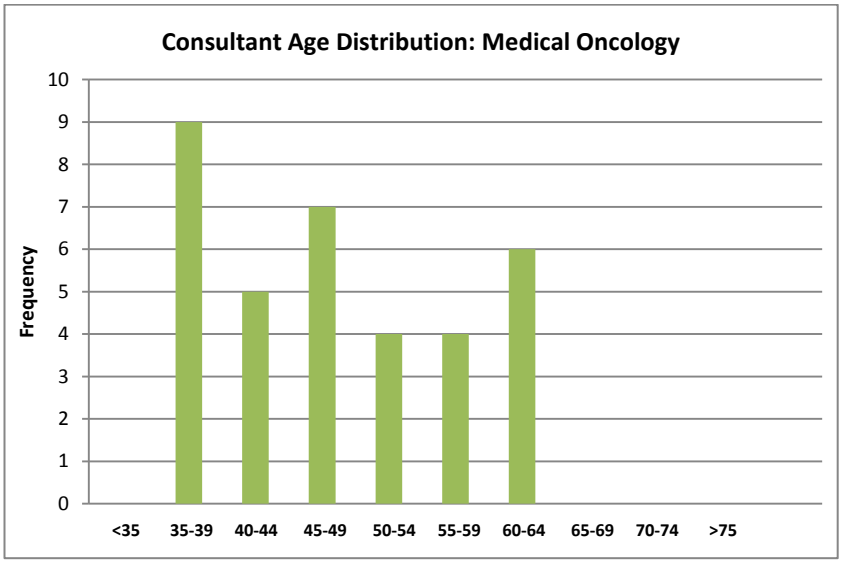
Infectious Diseases: A positively skewed, mesokurtotic distribution. Median age is 46 years.



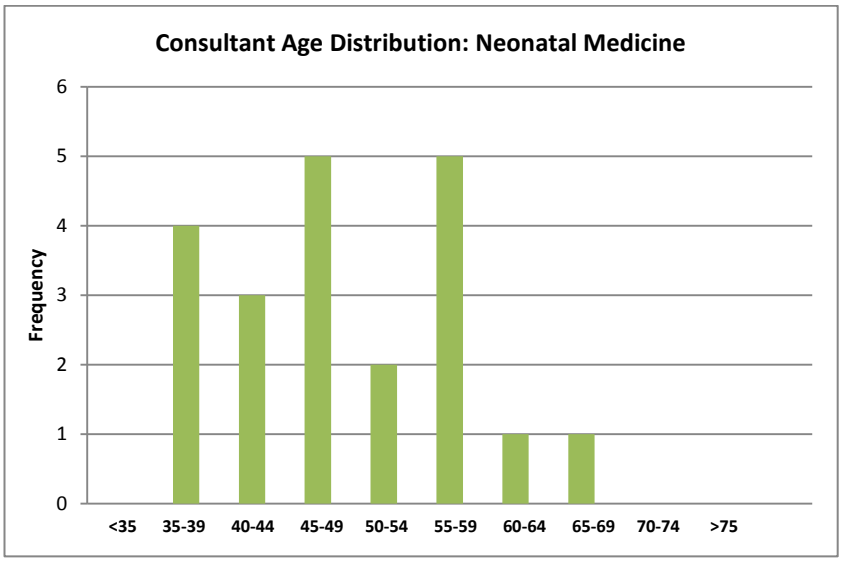
Intensive Care Medicine: A positively skewed, mesokurtotic distribution. Median age is 46 years.



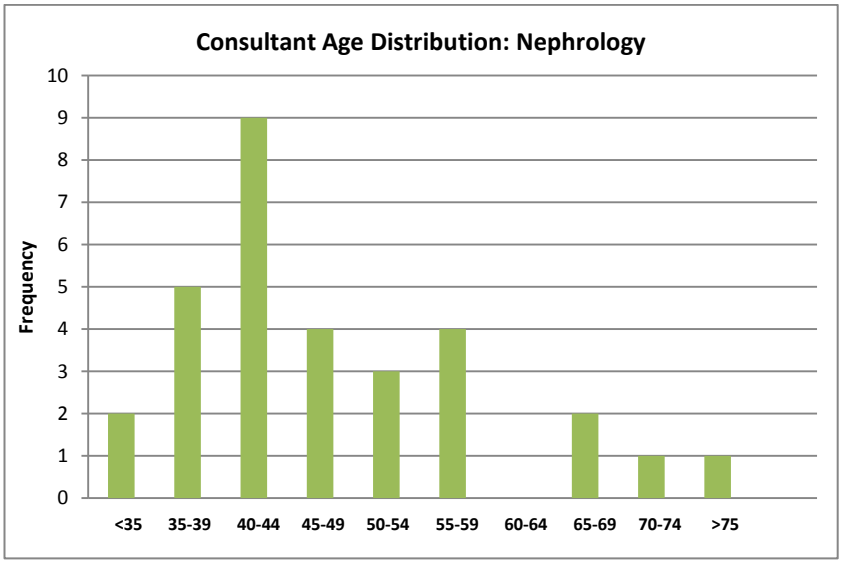
Medical Administration: A negatively skewed, mesokurtotic distribution with a truly aging workforce. Not unusual for this specialty. Median age is 58 years (above the optimal age target) but little need for concern as many have been senior consultants in another specialty prior to working in medical administration.



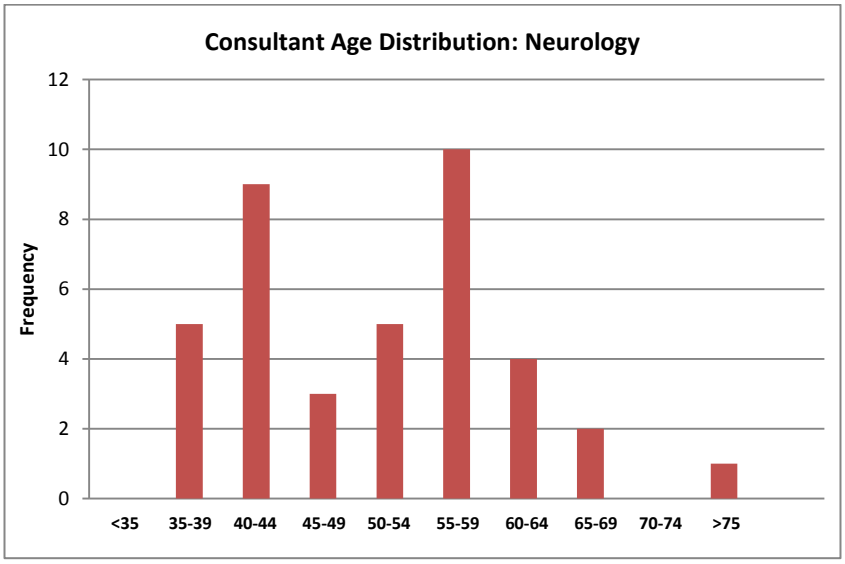
Medical Oncology: A positively skewed, mesokurtotic distribution. Median age is 47 years.



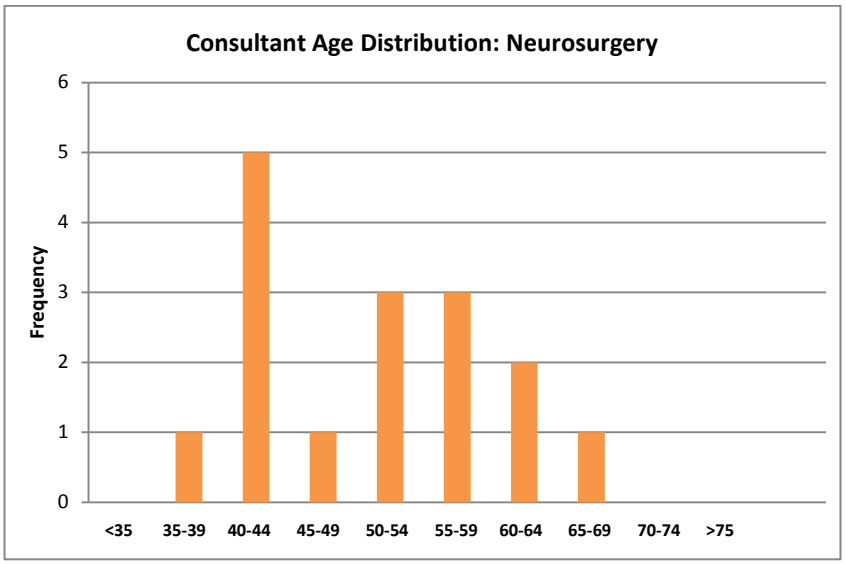
Neonatal Medicine: Weakly positively skewed, mesokurtotic distribution. Median age is 46 years.



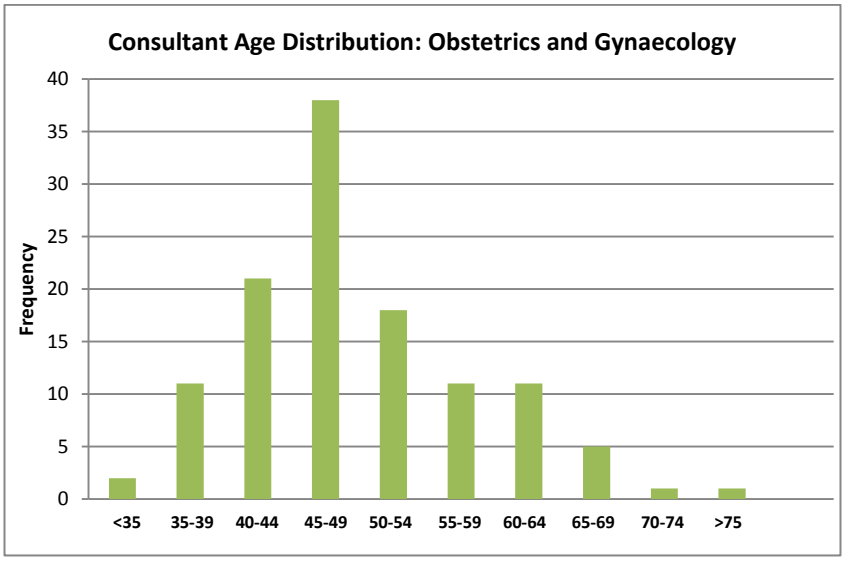
Nephrology: Positively skewed, mesokurtotic distribution. Median age is 46 years.



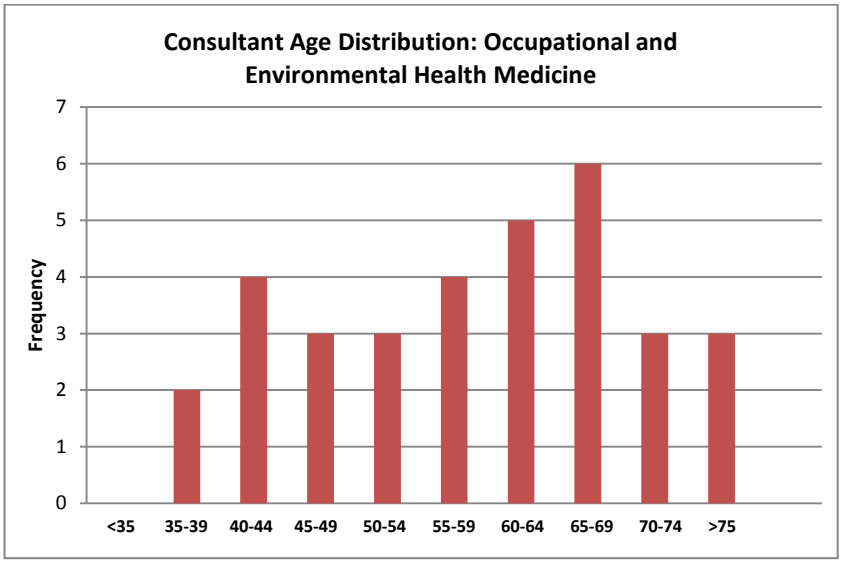
Neurology: A strongly bimodal, mesokurtotic distribution with relatively few personnel aged 44 to 54 years preceding the modal group currently aged 55 to 59 years. This is an aging workforce distribution requiring urgent attention. A significant proportion of the workforce is expected to retire over the next decade. Median age is 53 years (above the optimal age target).



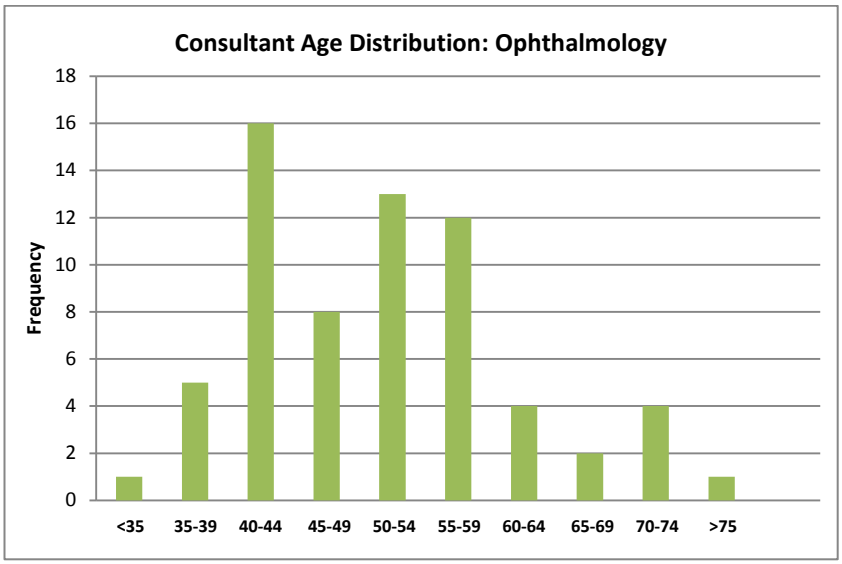
Neurosurgery: A roughly symmetrical, mesokurtotic distribution. Require more newly qualified consultants to replace approaching retirements. A significant proportion of the workforce is expected to retire over the next decade. Median age is 51 (well above the optimal age target for a surgical specialty).



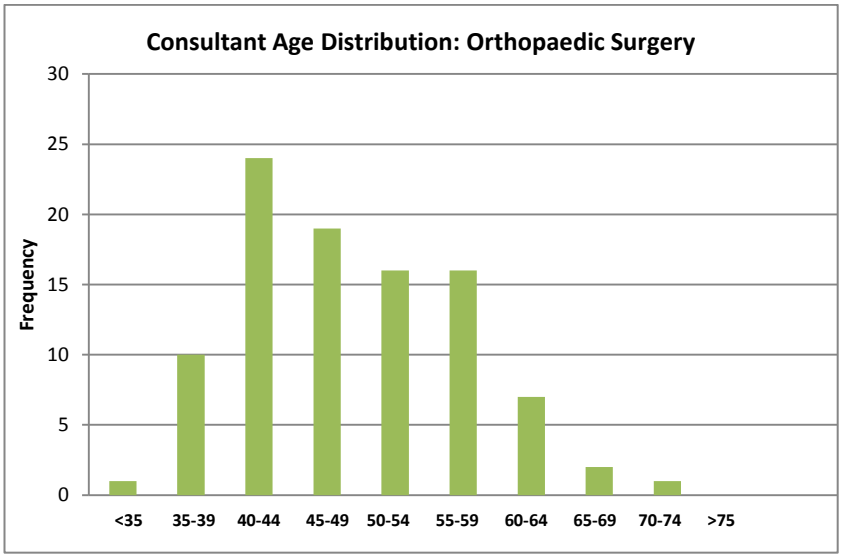
Obstetrics and Gynaecology: A positively skewed, mesokurtotic distribution. Median age is 48 years.



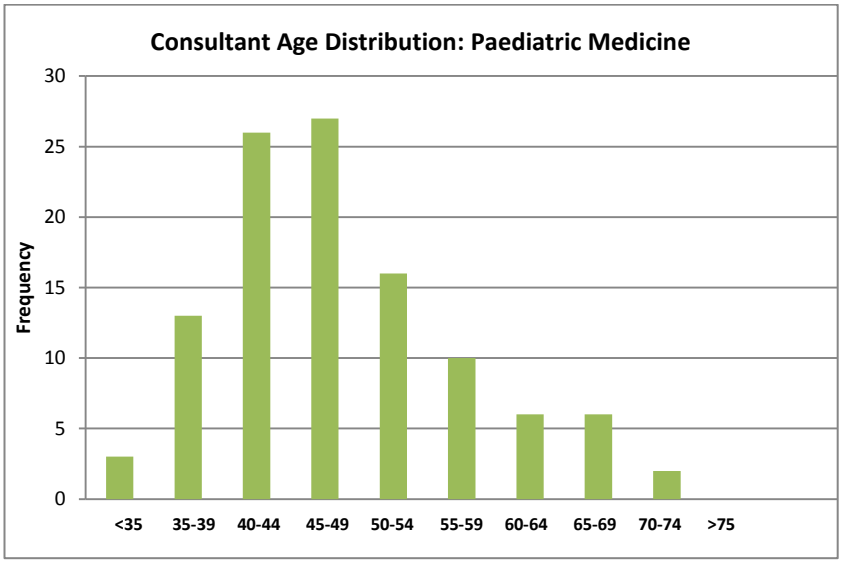
Occupational and Environmental Health Medicine: A negatively skewed, platykurtotic distribution with an aging (or advanced aged) workforce. Median age is 60 years. This is a strongly private practice dominant specialty.



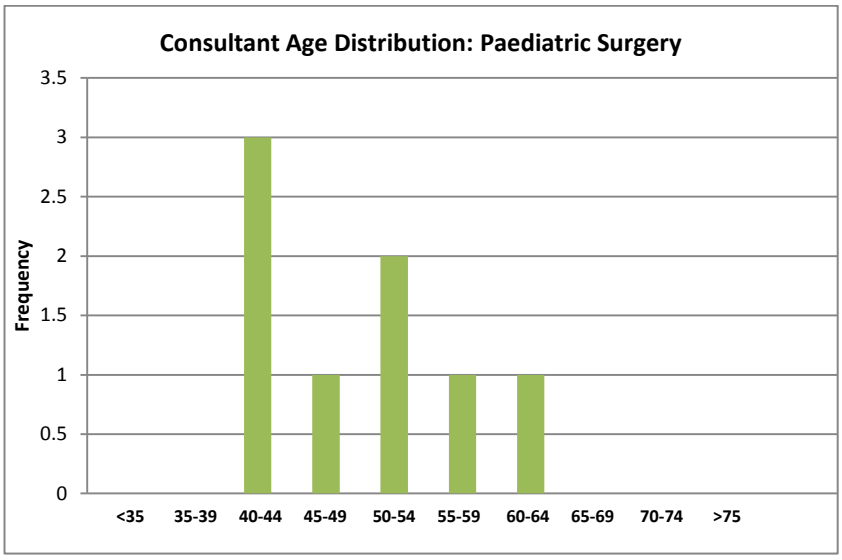
Ophthalmology: A positively skewed, mesokurtotic distribution. Median age is 50 years.



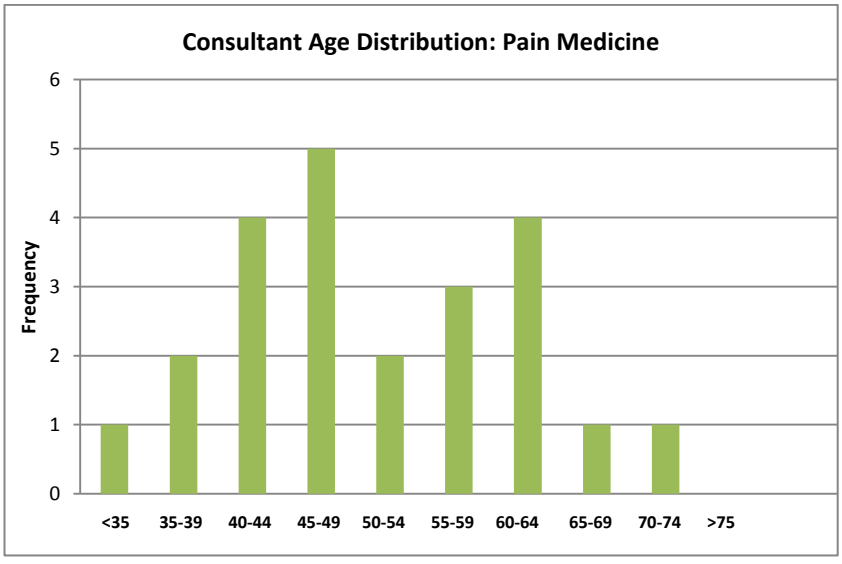
Orthopaedic Surgery: A positively skewed, mesokurtotic distribution. Median age is 50 years (above the optimal age target for a surgical specialty).



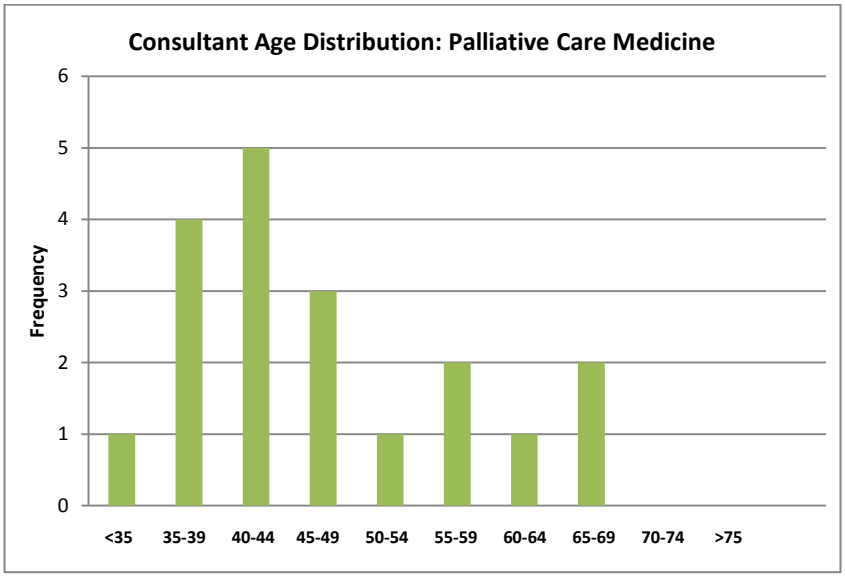
Paediatric Medicine: A positively skewed, mesokurtotic distribution. Median age is 47 years.



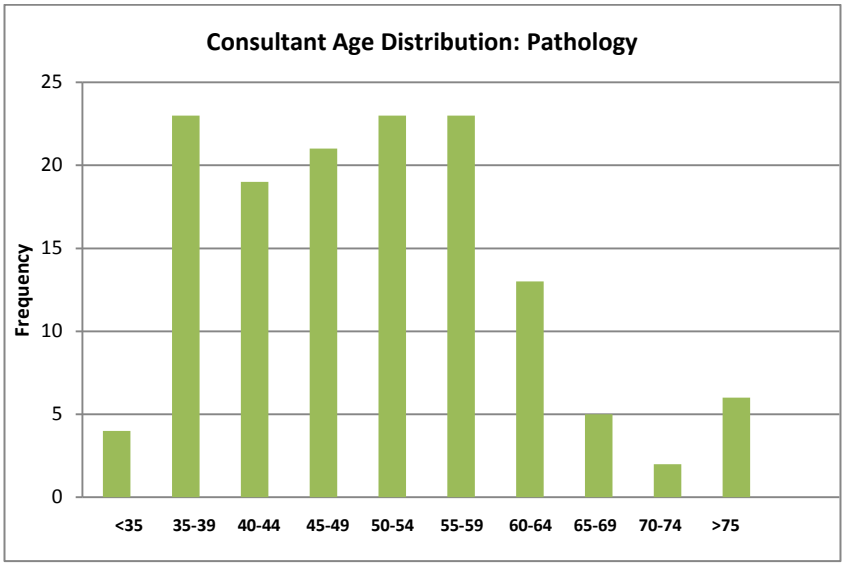
Paediatric Surgery: A positively skewed, mesokurtotic distribution. Median age is 50 years (above the optimal age target for a surgical specialty).



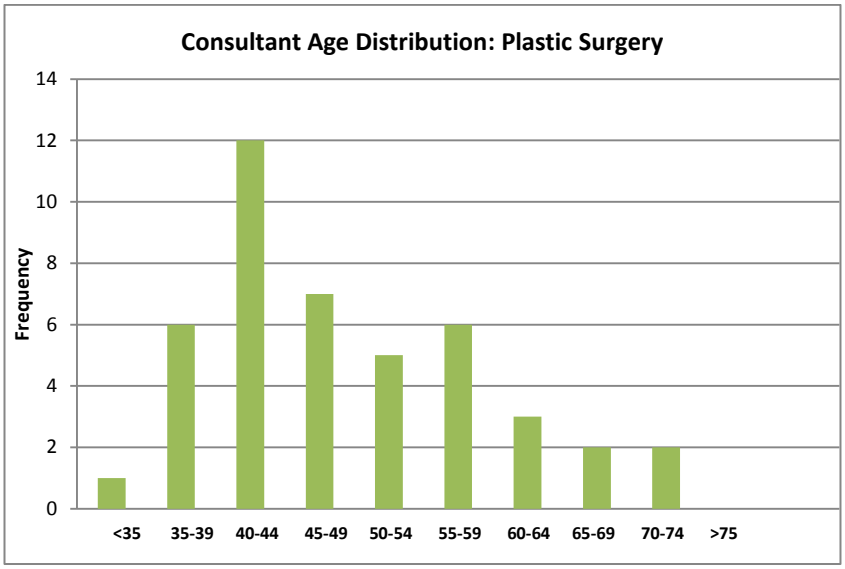
Pain Medicine: A positively skewed, weakly bimodal, mesokurtotic distribution. Minimal concern regarding the cohort approaching retirement as there are many anaesthetists also qualified in pain management (without positions). Median age is 49 years.



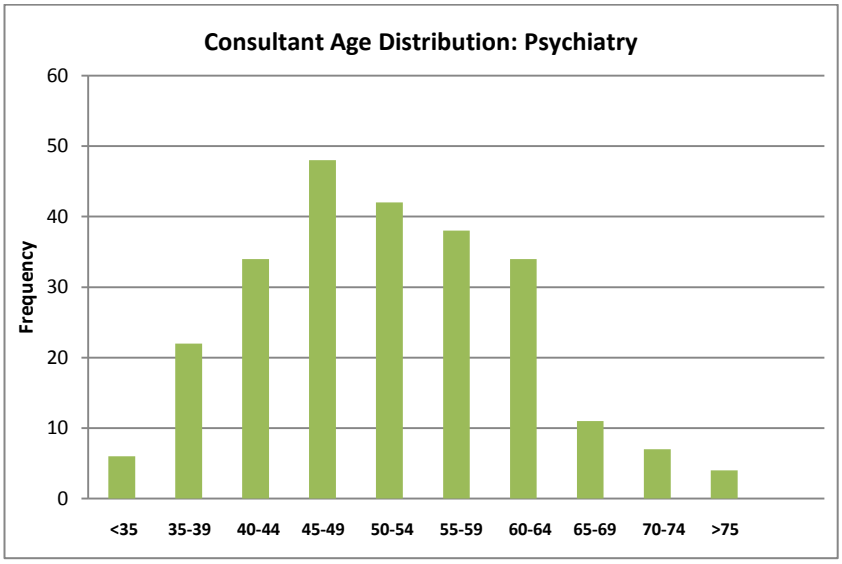
Palliative Care Medicine: A positively skewed, mesokurtotic distribution. Median age is 44 years.



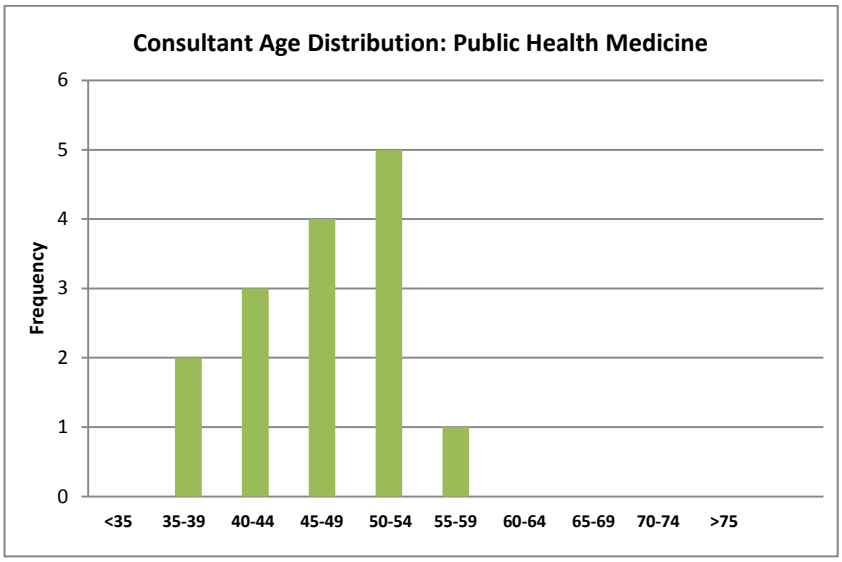
Pathology: A positively skewed, mesokurtotic distribution. Median age is 50 years.



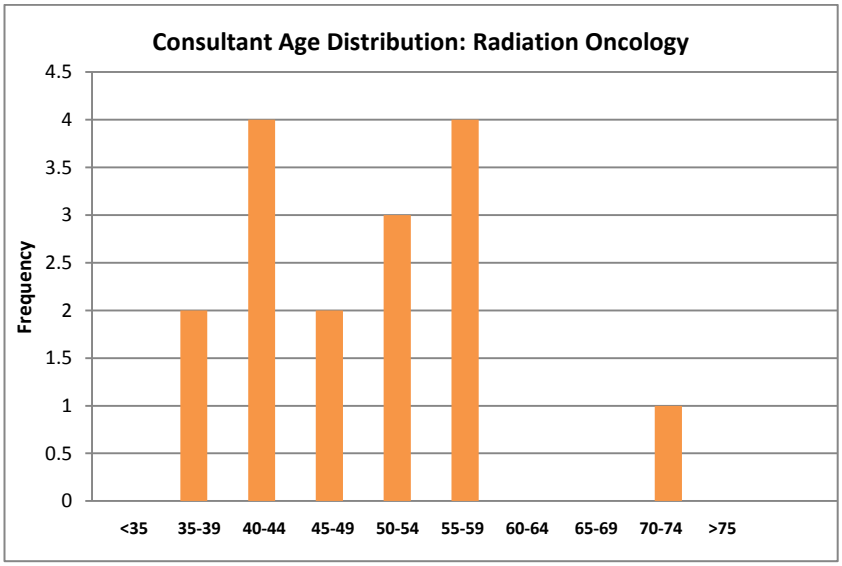
Plastic Surgery: A positively skewed, mesokurtotic distribution. Median age is 46 years.



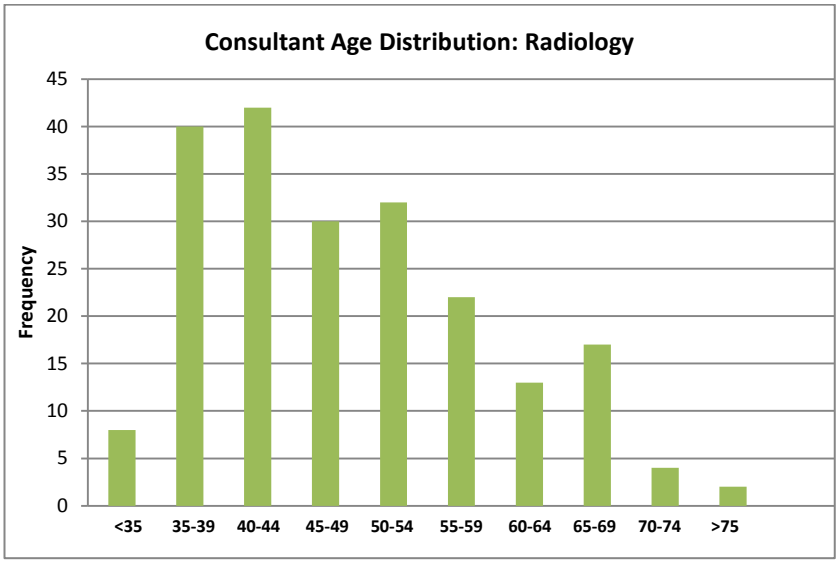
Psychiatry: A positively skewed, mesokurtotic distribution. Median age is 51 years. **Take note of this distribution:** This distribution is typical of the pre-1970's, very smooth with a rapid rate of increase to the peak age group (45-49 years), followed by a slow decline to the "retirement age (65 years)", a rapid loss at "retirement age", followed by a few personnel continuing past "retirement age". It is simple to predict retirement with accuracy using this data. This is a perfectly **shaped** workforce distribution.



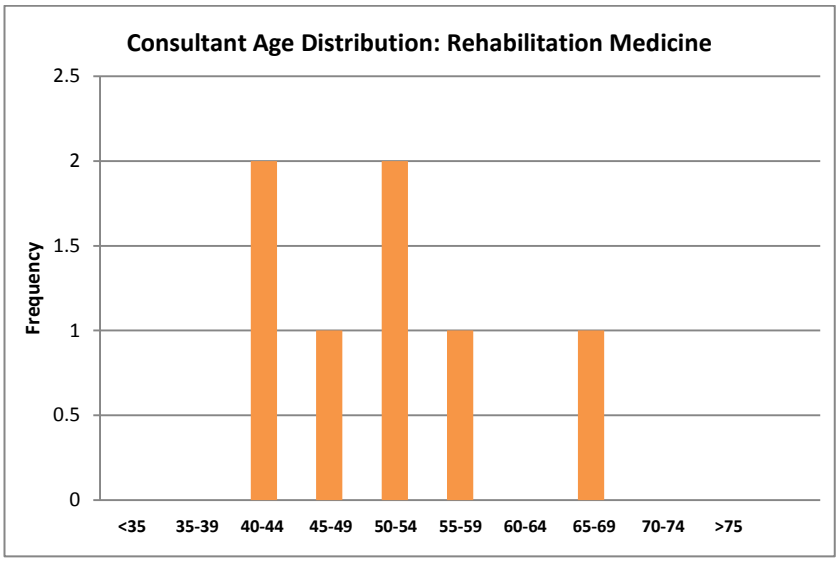
Public Health Medicine: A negatively skewed, mesokurtotic distribution (but a specialty in a period of growth with a young consultant age distribution). Median age is 46 years.



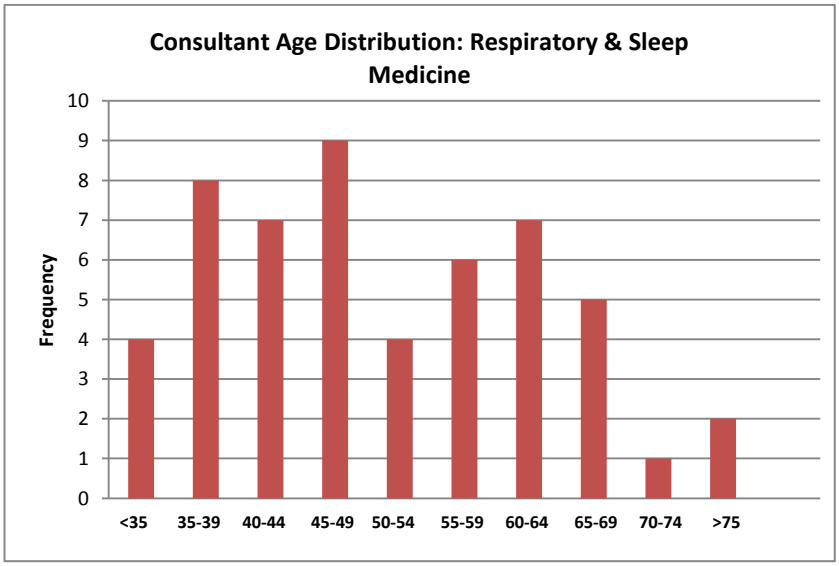
Radiation Oncology: A weakly bimodal, mesokurtic distribution. Require more newly qualified (younger) consultants to replace approaching retirements. Median age is 50 years.



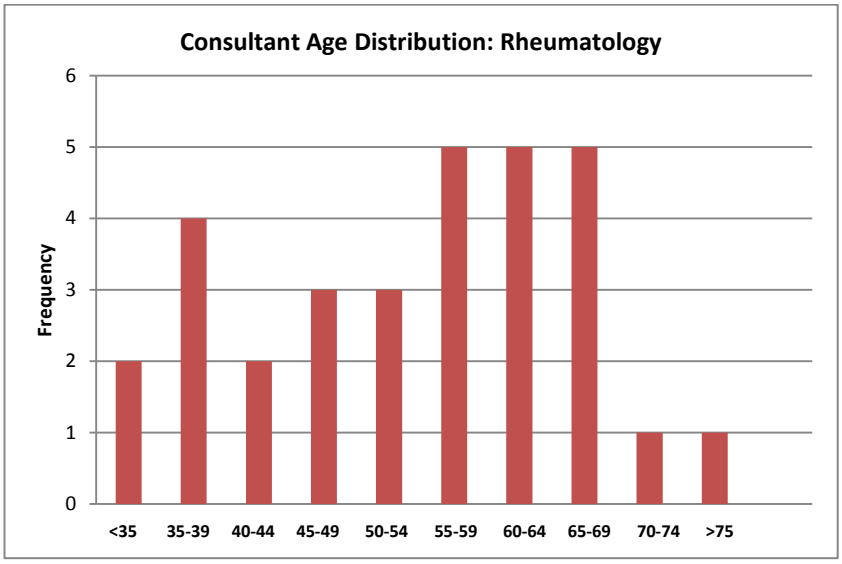
Radiology: A positively skewed, mesokurtotic distribution. Median age is 47 years.



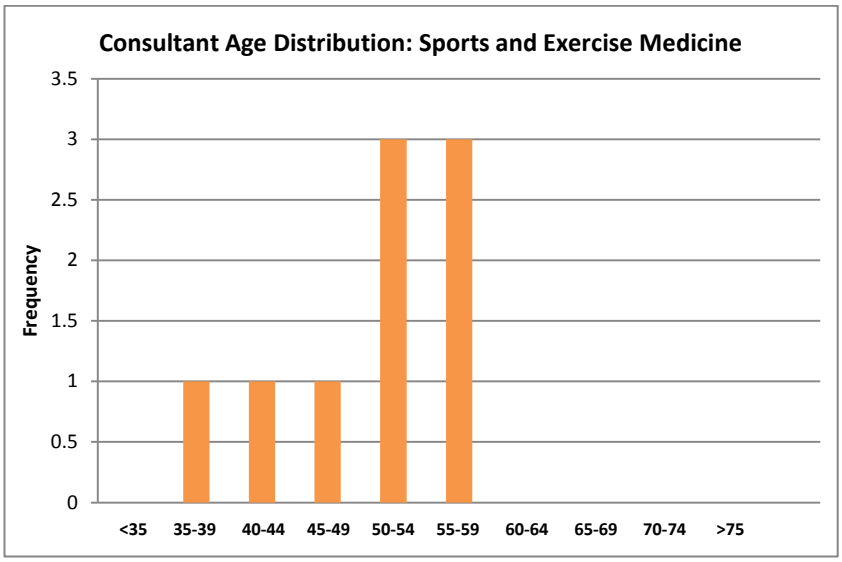
Rehabilitation Medicine: A small workforce with a good age spread. Need newly qualified consultants to replace approaching retirements. Median age is 52 years.



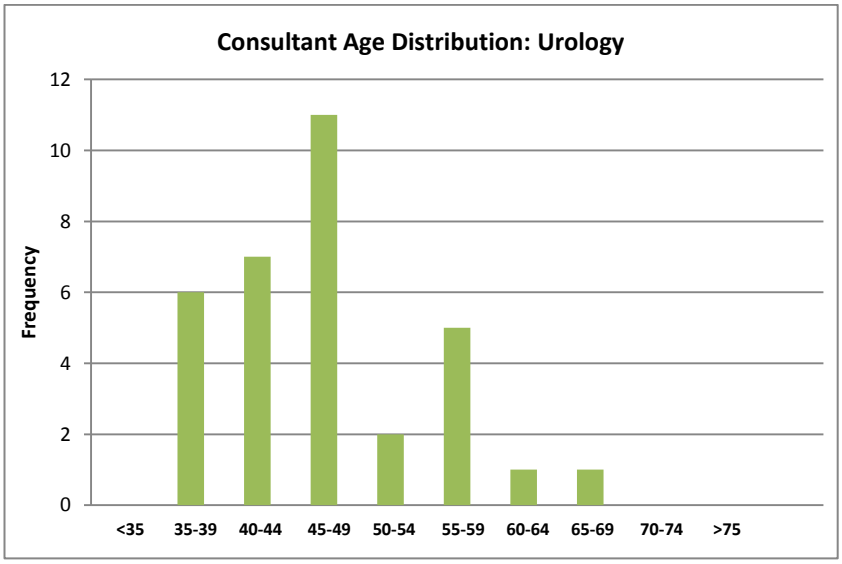
Respiratory and Sleep Medicine: A weakly positively skewed, mesokurtotic distribution and weakly bimodal. A significant proportion of the workforce is expected to retire over the next decade. Median age is 49 years.



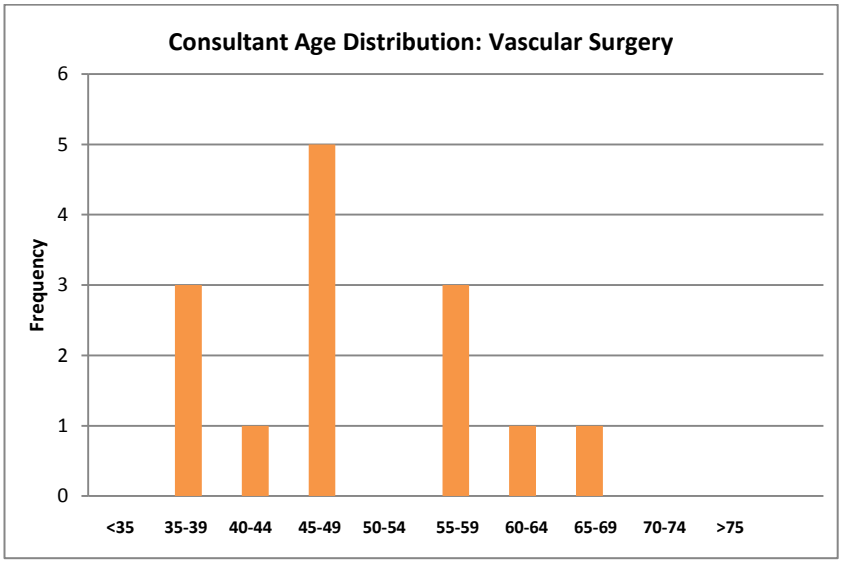
Rheumatology: A negatively skewed, platykurtotic distribution with a truly aging workforce. Require newly qualified (younger) consultants to replace personnel approaching retirement. A significant proportion of the workforce is expected to retire over the next decade. Median age is 55 years (above the optimal age target).



Sport and Exercise Medicine: A negatively skewed, platykurtotic distribution (but a relatively new specialty in a period of growth with a young consultant age distribution). A small workforce currently confined to the private practice sector. Median age is 52 years.



Urology: A positively skewed, mesokurtotic distribution. Median age is 46 years.



Vascular Surgery: An erratic (not smooth) small volume, mesokurtotic distribution with a significant trough (no-one aged between 49 and 56 years) between two peaks. Require newly qualified (young) consultants sufficient to replace approaching retirements (plus the 5 year trough). More than one third of the current workforce is expected to retire in the next decade. Median age is 46 years.

7. Consultant employment by medical specialty: Public and private sectors

Specialty	Public	Private	Both	Total	Percent Public	Percent Private
Addiction Medicine	7	0	4	11	81.8	18.2
Anaesthesia	167	79	173	419	60.5	39.5
Cardiology	24	24	29	77	50.0	50.0
Cardiothoracic Surg.	6	4	1	11	59.1	40.9
Clinical Genetics	7	0	0	7	100.0	0.0
Clinical Pharmacology	1	0	0	0	100.0	0.0
Dermatology	10	8	13	31	53.2	46.8
Emergency Medicine	129	17	17	163	84.4	15.6
Endocrinology	26	9	7	42	70.2	29.8
ENT Surgery	0	23	15	38	19.7	80.3
Gastroenterology	23	11	26	60	60.0	40.0
General Medicine	63	19	15	97	72.7	27.3
General Surgery	33	21	57	111	55.4	44.6
Geriatric Medicine	34	17	7	58	64.7	35.3
Haematology	12	15	4	31	45.2	54.8
Immunology	19	2	3	24	85.4	14.6
Infectious Disease	16	3	4	23	78.3	21.7
Intensive Care	23	27	2	52	46.2	53.8
Medical Admin.	14	0	12	26	76.9	23.1
Medical Oncology	29	6	1	36	81.9	18.1
Neonatal Medicine	11	0	10	21	76.2	23.8
Nephrology	15	15	3	33	50.0	50.0
Neurology	26	10	3	39	70.5	29.5
Neurosurgery	3	7	6	16	37.5	62.5
Obstet. & Gynaecology	40	19	62	121	58.7	41.3
Occ. & Environ. Health	3	24	6	33	18.2	81.8
Ophthalmology	10	16	40	66	45.5	54.5
Orthopaedic Surgery	23	32	41	96	45.3	54.7
Paediatric Medicine	71	15	26	112	75.0	25.0
Paediatric Surgery	1	5	2	8	25.0	75.0
Pain Medicine	13	5	5	23	67.4	32.6
Palliative Care	5	4	10	19	52.6	47.4
Pathology	82	6	53	141	77.0	23.0
Plastic Surgery	8	18	19	45	38.9	61.1
Psychiatry	176	15	55	246	82.7	17.3
Public Health	16	0	0	16	100.0	0.0
Radiation Oncology	4	9	4	17	35.3	64.7
Radiology	66	46	107	219	54.6	45.4
Rehab. Medicine	5	0	2	7	85.7	14.3
Resp. & Sleep Med.	30	13	10	53	66.0	34.0
Rheumatology	13	9	9	31	56.5	43.5
Sexual Health	2	1	0	3	66.7	33.3
Sport & Exercise Med.	0	9	0	9	0.0	100.0
Urology	11	7	15	33	56.1	43.9
Vascular Surgery	6	5	3	14	53.6	46.4
Total	**1283**	**575**	**881**	**2739**	**62.9**	**37.1**

8. Distribution of consultants by metropolitan and rural location

Medical Specialty	Metro	Rural	Both	Total	Percentage Rural
Addiction Medicine	11	0	0	11	0
Anaesthesia	386	30	3	419	7.5
Cardiology	75	1	1	77	1.9
Cardiothoracic Surg.	11	0	0	11	0
Clinical Genetics	7	0	0	7	0
Clinical Pharmacology	1	0	0	1	0
Dermatology	31	0	0	31	0
Emergency Medicine	144	13	6	163	9.8
Endocrinology	41	1	0	42	2.4
ENT Surgery	32	2	4	38	10.5
Gastroenterology	60	0	0	60	0
General Medicine	76	21	0	97	21.6
General Surgery	95	15	1	111	14.0
Geriatric Medicine	57	1	0	58	1.8
Haematology	28	2	1	31	8.1
Immunology	24	0	0	24	0
Infectious Disease	22	1	0	23	4.3
Intensive Care	51	1	0	52	2.0
Medical Admin.	23	3	0	26	11.5
Medical Oncology	34	1	0	35	2.9
Neonatal Medicine	21	0	0	21	0
Nephrology	31	1	1	33	4.5
Neurology	39	0	0	39	0
Neurosurgery	16	0	0	16	0
Obstet. & Gynaecology	109	12	0	121	9.9
Occ. & Environ. Health	33	0	0	33	0
Ophthalmology	62	4	0	66	6.1
Orthopaedic Surgery	86	6	4	96	8.3
Paediatric Medicine	97	15	0	112	13.4
Paediatric Surgery	8	0	0	8	0
Pain Medicine	23	0	0	23	0
Palliative Care	18	1	0	19	5.3
Pathology	140	1	0	141	0.7
Plastic Surgery	44	1	0	45	2.2
Psychiatry	228	17	1	246	7.1
Public Health	11	5	0	16	31.3
Radiation Oncology	16	1	0	17	5.9
Radiology	193	17	9	219	9.8
Rehab. Medicine	7	0	0	7	0
Resp. & Sleep Med.	51	2	0	53	3.8
Rheumatology	30	1	0	31	3.2
Sexual Health	3	0	0	3	0
Sport & Exercise Med.	9	0	0	9	0
Urology	30	3	0	33	9.1
Vascular Surgery	13	0	1	14	3.6
Total	**2527**	**179**	**32**	**2738**	**7.1%**

9. Consultant supply estimates 2013 with projections for 2016 and 2021 (self-sufficiency scenario)

Specialty	2013				2016			2021		
	Consult	Trainees	Program Length (Years)	Grads per Year	Retired	New Consult.	2016 Supply	Retired	New Consult.	2021 Supply
Addiction Medicine	11	2	3	0.47	0	1	12	4	4	11
Anaesthesia	419	113	5	15.82	49	47	417	92	127	454
Cardiology	77	12	3	3.7	14	11	74	22	30	85
Cardiothoracic	11	4	6	0.47	1	1	11	3	4	12
Clinical Genetics	7	1	3	0.31	1	1	7	1	2	8
Clinical	1	0	3	0	0	0	1	1	0	0
Dermatology	31	6	4	1.05	5	3	29	8	8	31
Emergency	163	58	5	8.12	4	24	183	10	65	218
Endocrinology	42	9	3	2.78	8	8	42	9	22	55
ENT Surgery	38	7	5	0.98	6	3	35	10	8	36
Gastroenterology	60	8	3	1.87	5	6	61	15	15	60
General Medicine	97	26	3	8.02	14	24	107	26	64	135
General Surgery	111	36	5	6.66	17	20	114	26	53	138
Geriatric Medicine	58	18	3	5.55	5	17	70	8	44	94
Haematology	31	4	5	0.56	8	2	25	10	4	25
Immunology	24	4	5	0.56	5	2	21	6	4	22
Infectious Disease	23	4	3	1.23	0	4	27	1	10	32
Intensive Care	52	39	6	4.55	7	14	59	9	36	79
Medical Admin.	26	2	3	0.47	9	1	18	15	4	15
Medical Oncology	35	7	3	2.26	4	6	38	8	17	45
Neonatal Medicine	21	15	3	4.63	1	14	34	4	37	54
Nephrology	33	8	3	2.47	4	7	36	8	20	45
Neurology	39	4	3	1.23	4	4	39	12	10	37
Neurosurgery	16	4	6	0.62	2	2	16	4	5	17
Obstet. &	121	33	6	3.85	16	12	117	24	31	128
Occ. & Environ.	33	17	4	2.98	13	9	29	20	24	37
Ophthalmology	66	9	5	1.26	10	4	60	19	10	57
Orthopaedic	96	26	5	3.64	6	11	101	23	29	102
Paediatric Medicine	112	27	3	8.33	11	25	126	18	67	161
Paediatric Surgery	8	1	6	0.12	0	0	8	2	1	7
Pain Medicine	23	5	3	1.17	6	4	21	7	9	25
Palliative Care	19	8	3	1.87	3	6	22	4	15	30
Pathology	141	34	5	4.76	19	14	136	34	38	145
Plastic Surgery	45	10	5	1.4	6	4	43	10	11	46
Psychiatry	246	74	5	10.36	41	31	236	77	83	252
Public Health	16	8	3	1.87	0	6	22	1	15	30
Radiation Oncology	17	2	5	0.28	1	1	17	5	2	14
Radiology	219	31	5	4.34	30	13	202	48	35	206
Rehab. Medicine	7	5	4	1	1	3	9	1	8	14
Resp. & Sleep Med.	53	1	3	0.31	13	1	41	17	2	38
Rheumatology	31	4	3	1.23	10	4	25	14	10	27
Sexual Health	3	2	3	0.47	0	1	4	1	4	6
Sport & Exercise	9	0	4	0	0	0	9	1	0	8
Urology	33	9	6	1.05	2	3	34	5	8	36
Vascular Surgery	14	2	5	0.28	1	1	14	3	2	13

10. Weighted Activity Based demand model

The WAB demand modelling framework provides weighted volume of activity by specialty and average weighted volume of activity by consultant. The multiplication of that activity by the National Efficient Price (NEP) provides the value of activity by specialty and, consequently, the value of activity by consultant.

The first step in developing the WAB demand model was mapping the activity data to each specialty. All specialties were mapped to the inpatient AR-DRG classification system and outpatient Tier 2 Specialist Outpatient Clinic Code. Emergency medicine was mapped to the URG Triage Codes.

Data on national cost weights and WA aggregated (non-episode level) activity data was obtained for 2011-2014, and this information was used to calculate weighted activity (volume and value of activity) by medical specialty for the financial year periods 2011/12, 2012/13, and to March 2014 for the 2013/14 financial year. Annual change in demand by specialty was calculated by change in weighted activity by specialty during the period (with adjustment for population).

The WAB demand model was used to estimate consultant demand by specialty for 2013 and projected consultant demand by specialty to the year 2021. Estimated under or over supply in demand by specialty was confirmed by comparing trainee throughput to growth in 'service delivery based demand' and 'retirement based demand'.

During SWCP 2013, demand estimates were shown to be consistent with estimates derived from alternative sources and expert opinion. The WAB model worked effectively for inpatient mappings for surgical specialties and clinical specialties, as well as outpatient and emergency medicine; however, there were some limitations:

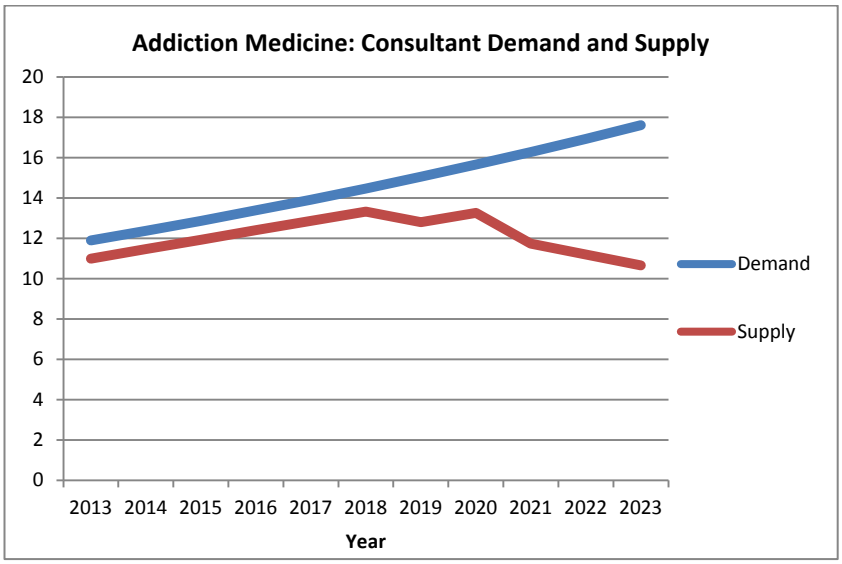
- Core support specialties (anaesthesia, pathology and radiology) were less precise as activity was measured by proxy activity derived from the surgical and clinical specialties, e.g. anaesthesia activity was estimated from the total volume of surgical procedures performed that require anaesthesia services.
- Medical administration, public health medicine and clinical pharmacology were also less precise as activity was measured by proxy activity derived from the total volume of hospital activity. These specialties have no directly assignable patients and cannot be mapped to a patient type classification.
- Sports and exercise medicine was confined to the private practice sector and activity could not be mapped to a hospital patient type classification. Demand was calculated from FTE data and assumed to meet supply in the private sector.

The WAB demand model will be updated to include the most recently available activity data, and reviewed on an annual basis to ensure that:

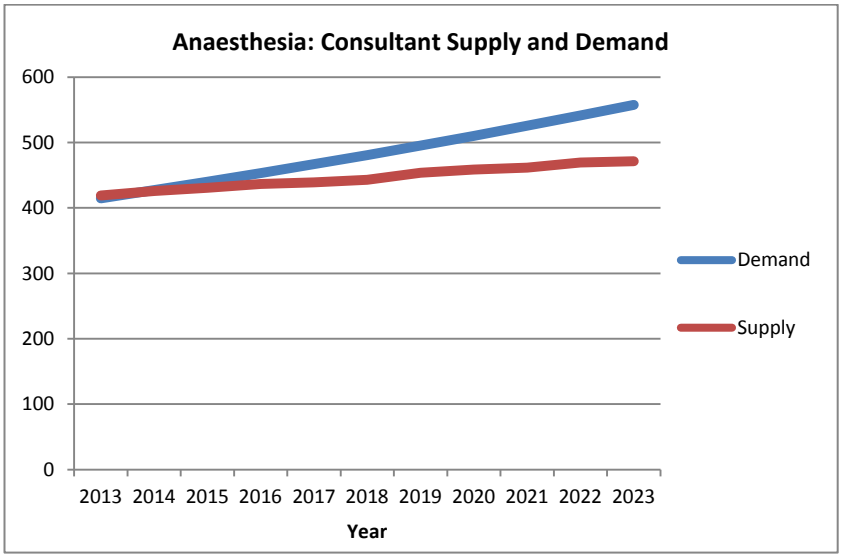
- All IHPA determinations are incorporated in the patient classification systems to enable series continuity of the data sets.
- Annual national cost weight data for all patient classification types are included for 2014/15 when 2013/14 data has been finalised.
- Newly recognised specialties and subspecialties require mapping throughout the patient type classification systems on an annual basis.

A new patient type classification code developed to enable inclusion of sub-acute and non-acute hospital patients (AN-SNAP code) will feed into the WAB model when it becomes available. This classification system will enable capture of further hospital activity data, and improve the precision of a small subset of specialties, especially palliative care medicine, rehabilitation medicine, geriatric medicine and psychiatry.

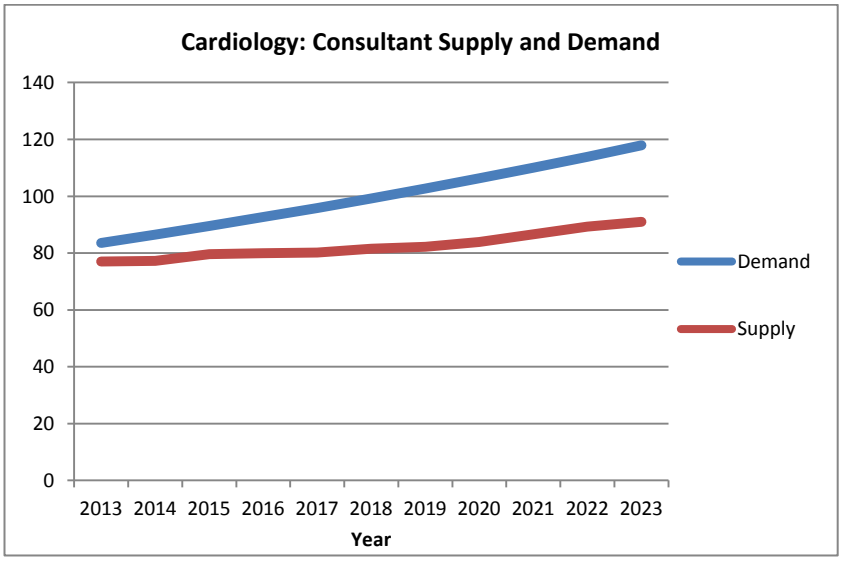
11. Time series of consultant supply and demand 2013 to 2023



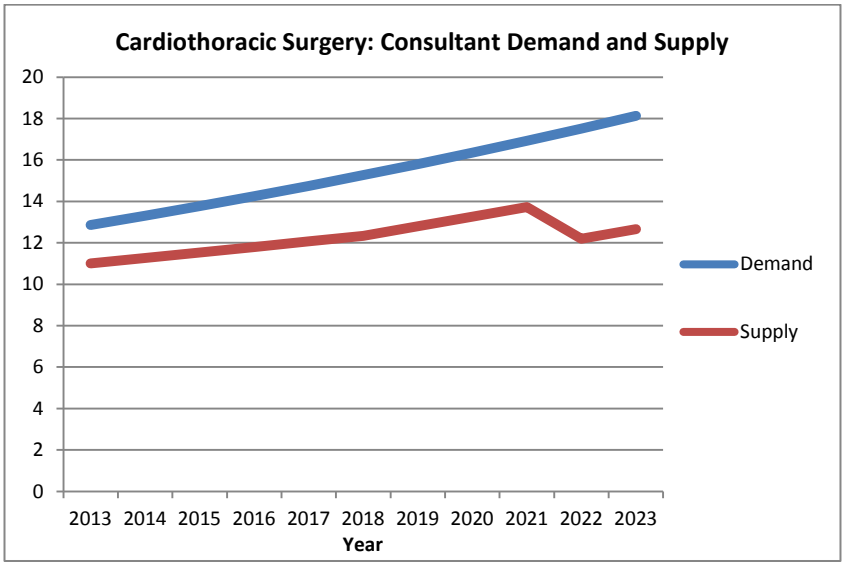
Addiction Medicine: A rapid decline in supply due to expected retirements. Significant unmet demand, especially in rural areas.



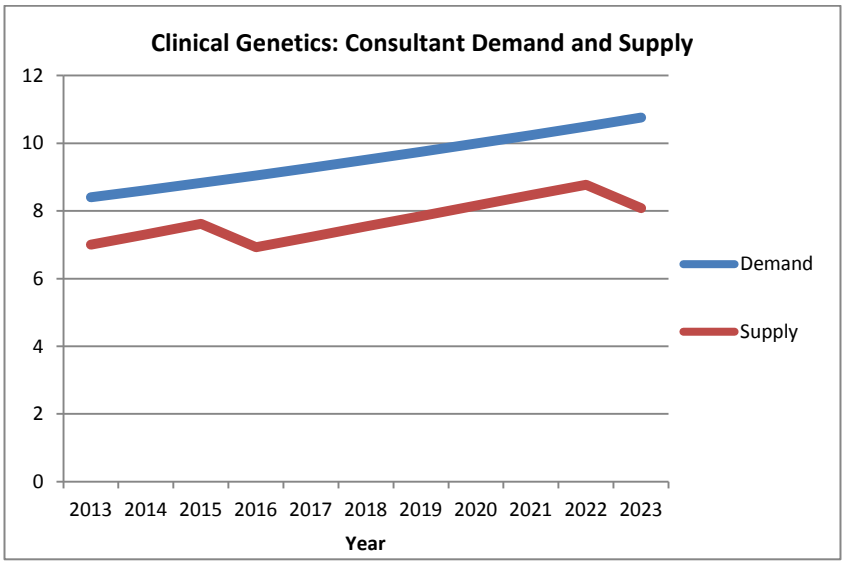
Anaesthesia: Hidden oversupply with a high volume of low FTE.



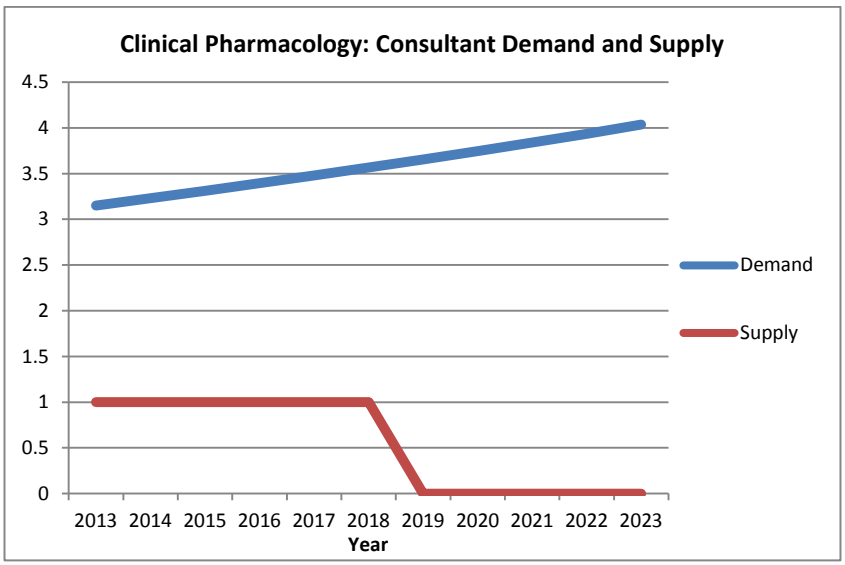
Cardiology: Slight undersupply and approaching retirements.



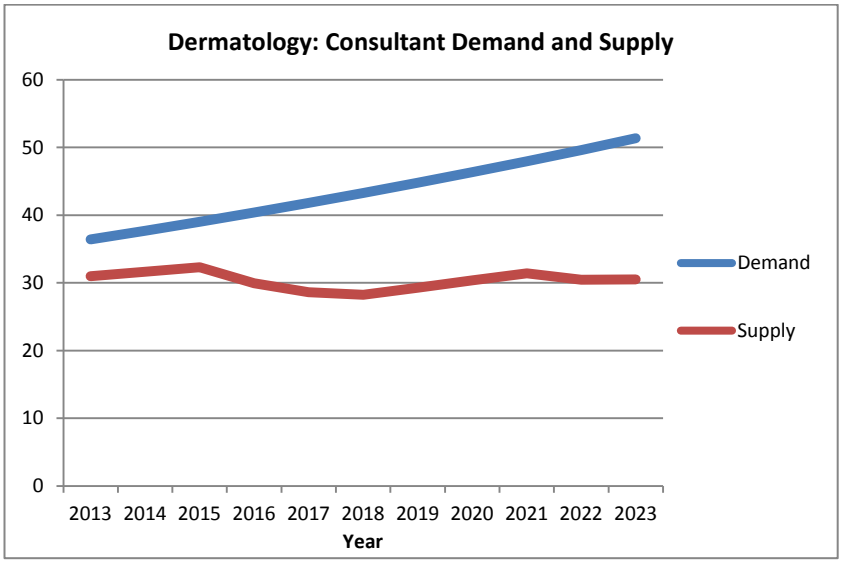
Cardiothoracic Surgery: Undersupply.



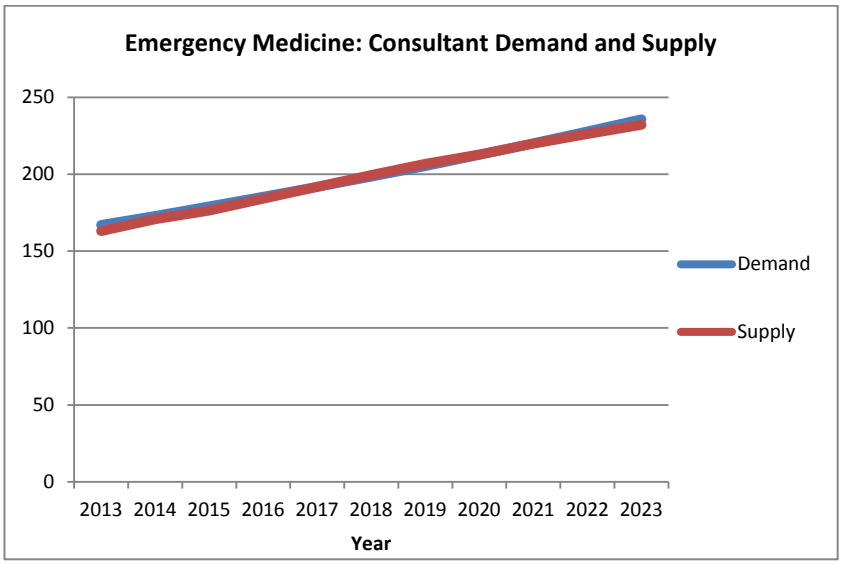
Clinical Genetics: Activity data not fully captured and low weighting under ABF/M.



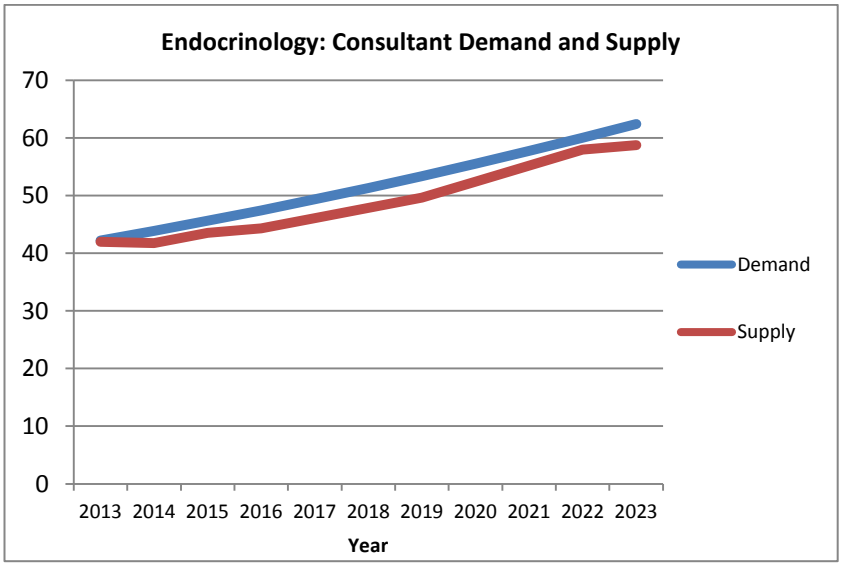
Clinical Pharmacology: A 0.5 FTE consultant approaching retirement.



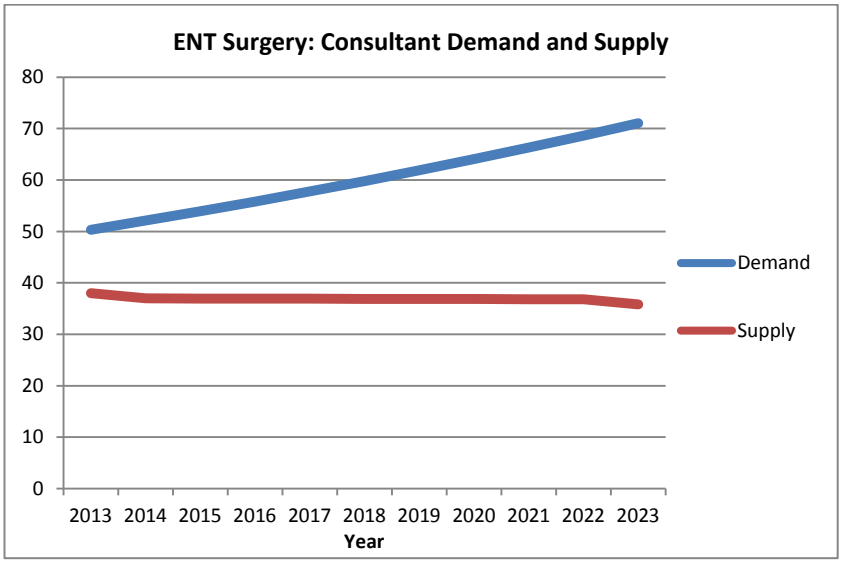
Dermatology: Low trainee throughput and expected retirements (no growth in supply).



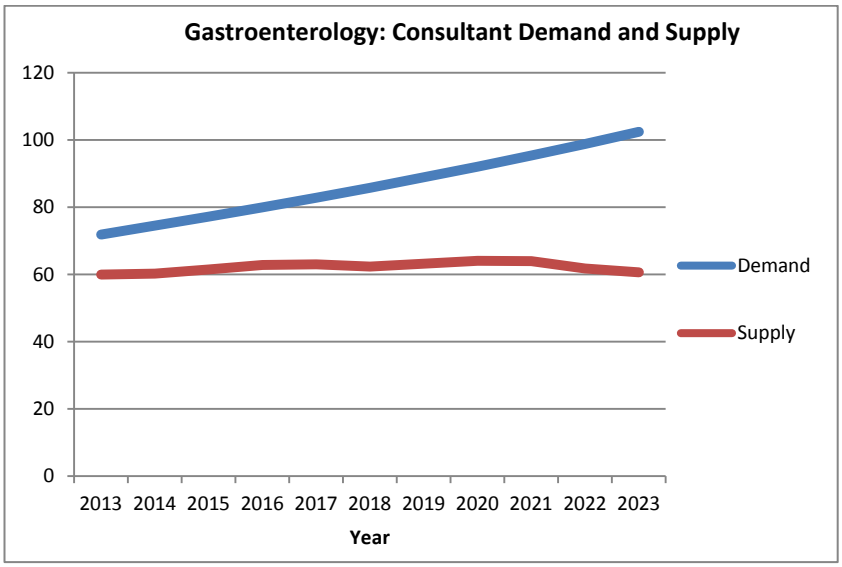
Emergency Medicine: Ideal.



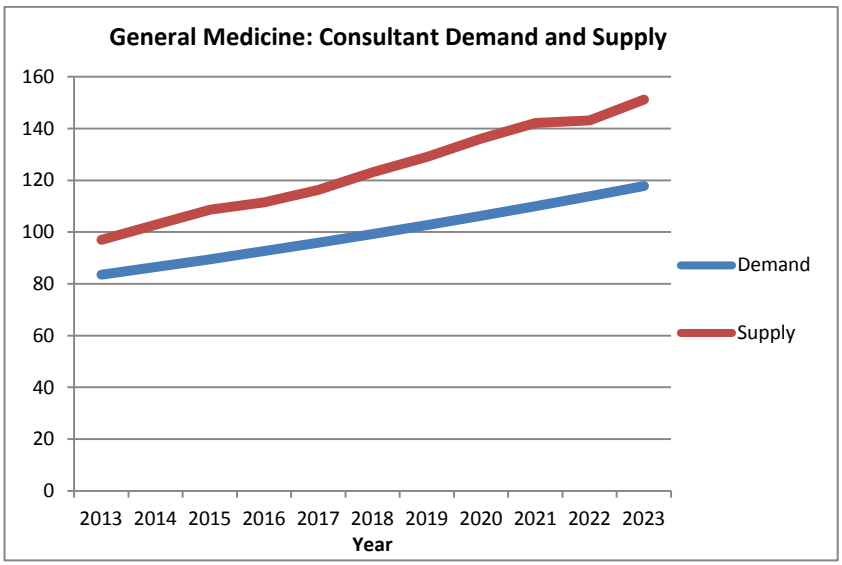
Endocrinology: Demand higher than indicated with increasing activity moving to the lower weighted outpatient setting.



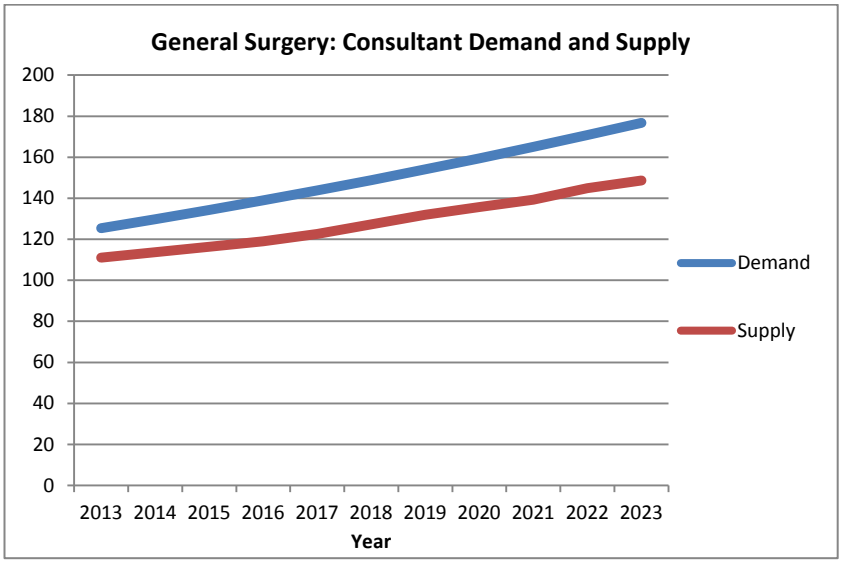
ENT Surgery: Undersupply and retirements (no growth in supply).



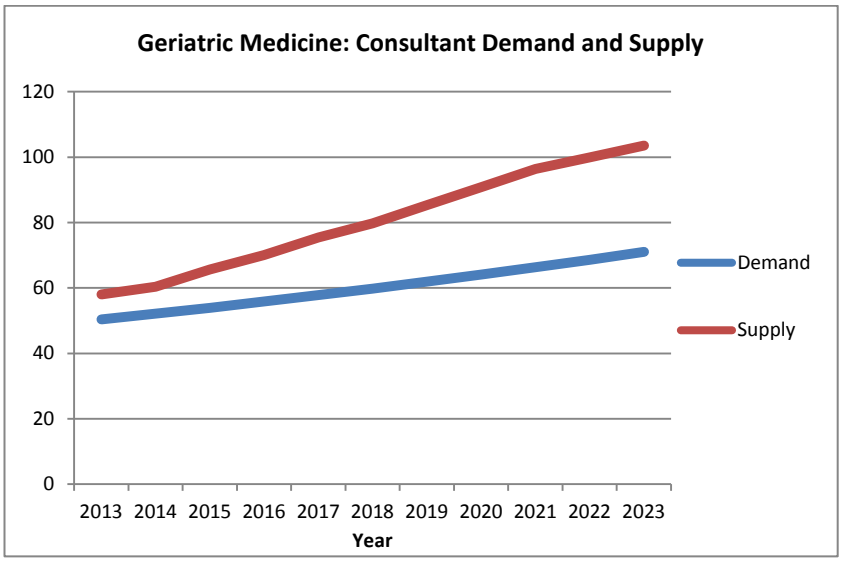
Gastroenterology: Undersupply and retirements (no growth in supply).



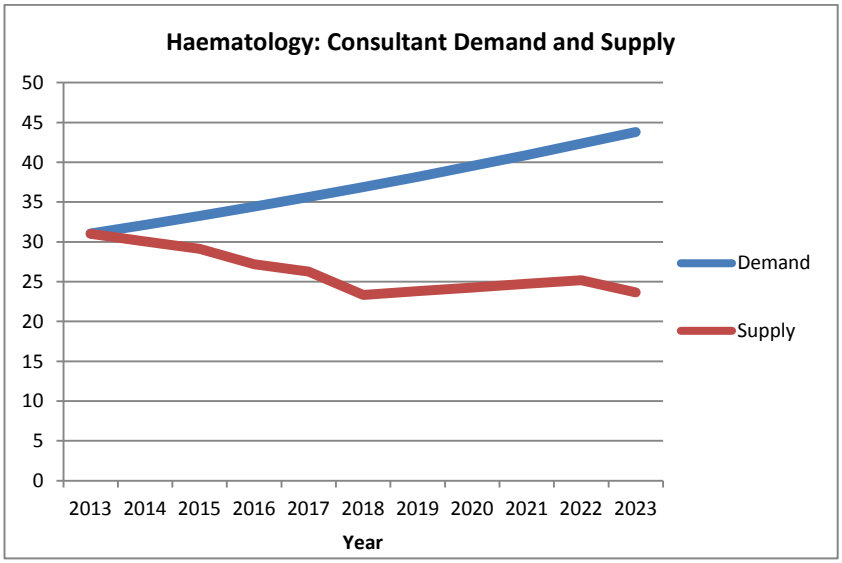
General Medicine: High trainee throughput.



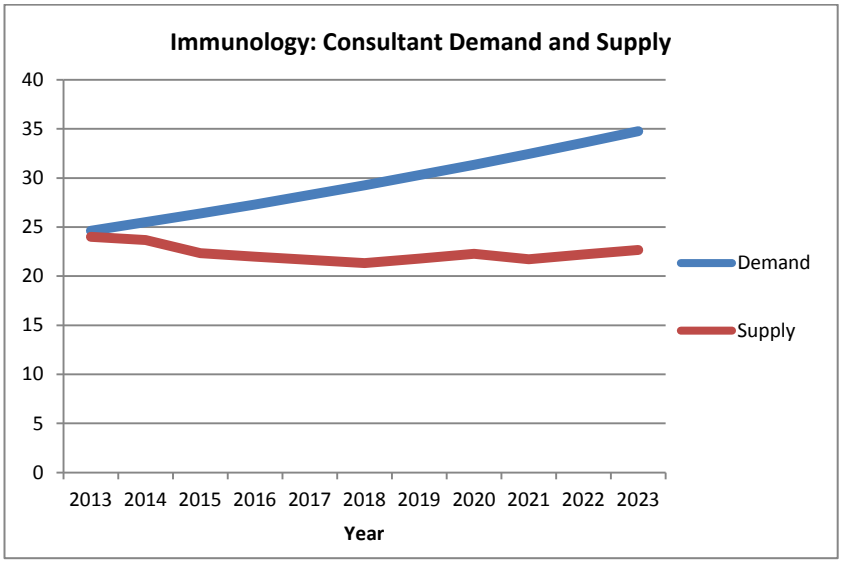
General Surgery: Undersupply and expected retirements.



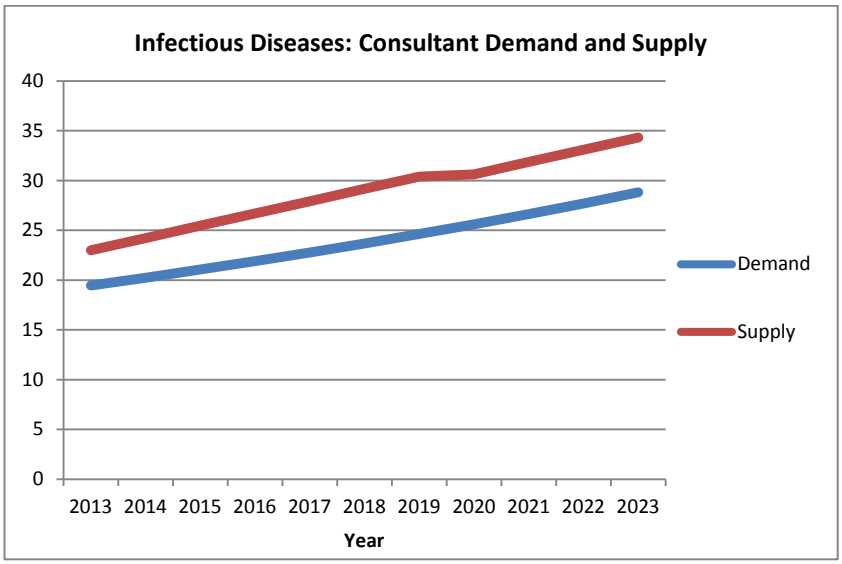
Geriatric Medicine: Large proportion of Geriatric Medicine is non-hospital based and sub-acute patients (demand not adequately captured).



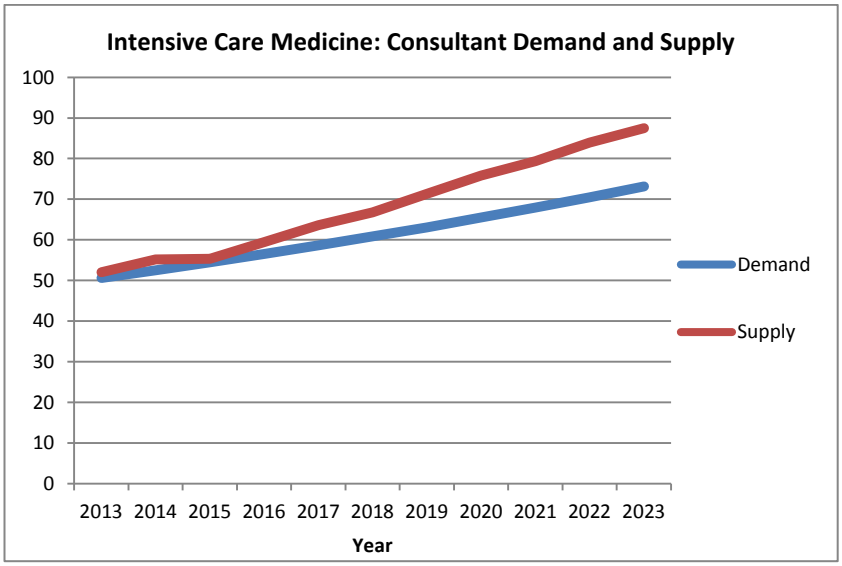
Haematology: Large volume of retirements expected (no growth in supply).



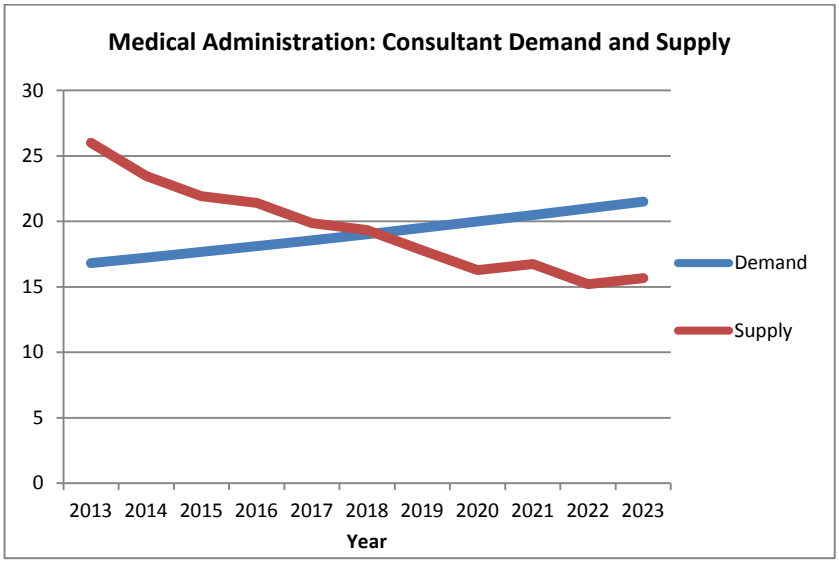
Immunology: Large volume of retirements expected (no growth in supply).



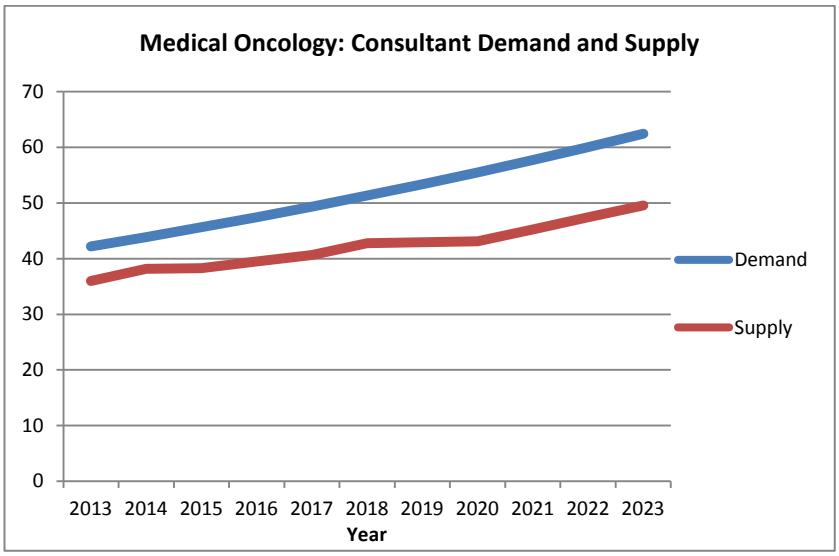
Infectious Diseases: Microbiology activity not adequately captured and multi-disciplinary outpatient activity not assigned (demand not adequately captured).



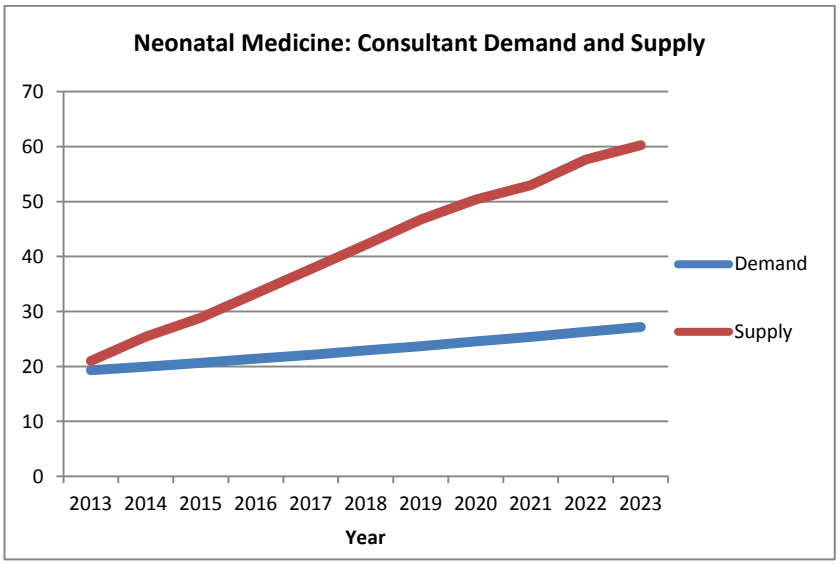
Intensive Care Medicine: Oversupply.



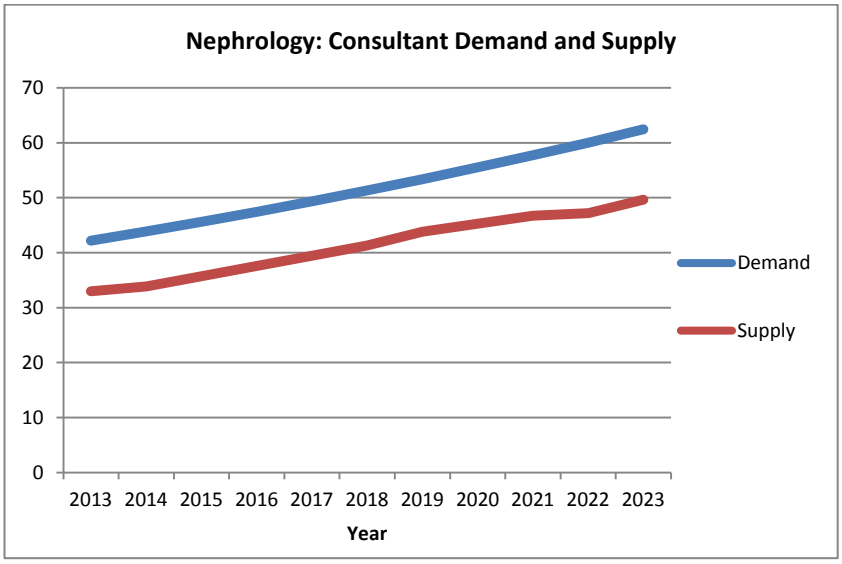
Medical Administration: Large volume of retirements expected.



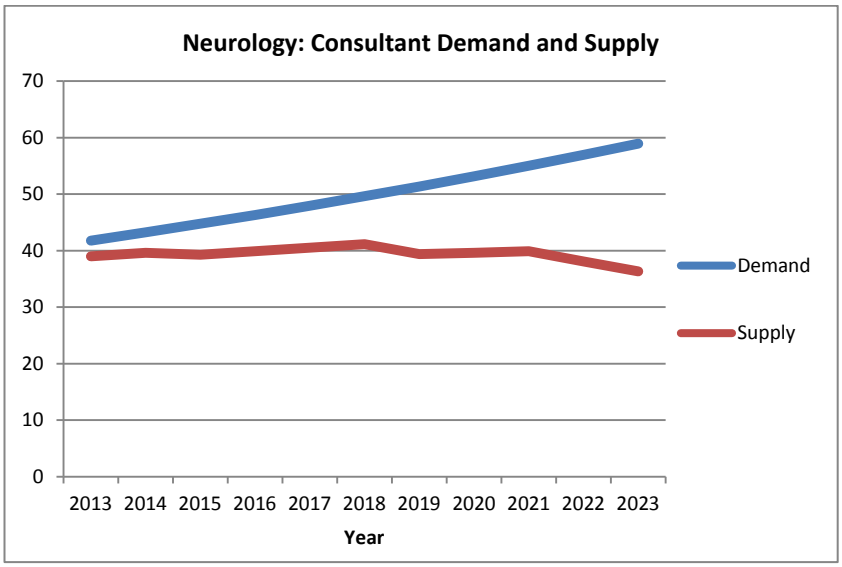
Medical Oncology: Undersupply.



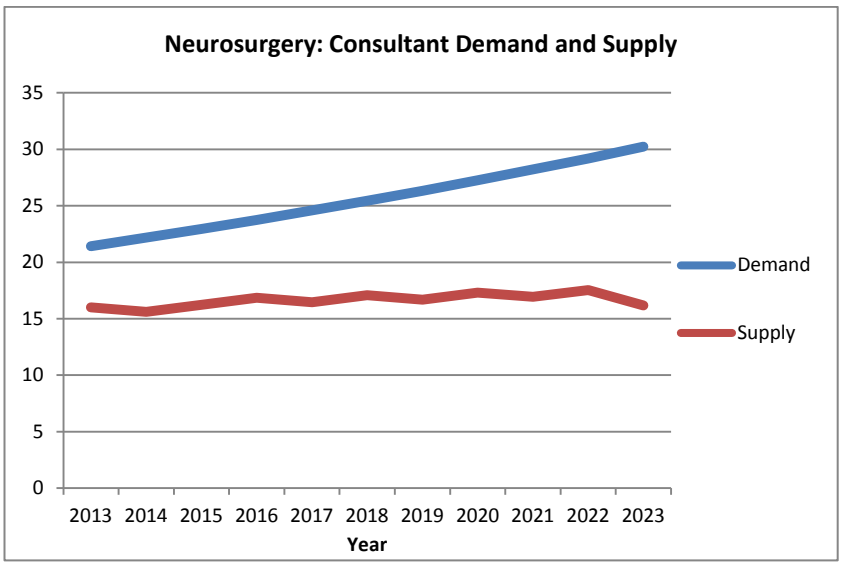
Neonatal Medicine: Oversupply; however, a large proportion of vocational trainees are IMGs intending to return to country of origin.



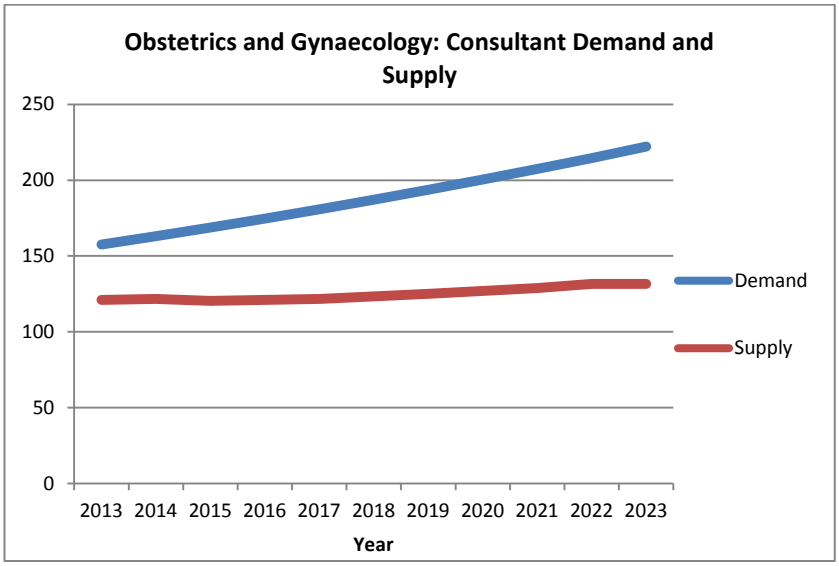
Nephrology: Undersupply although a large volume of dialysis activity is performed by nursing staff (or patients).



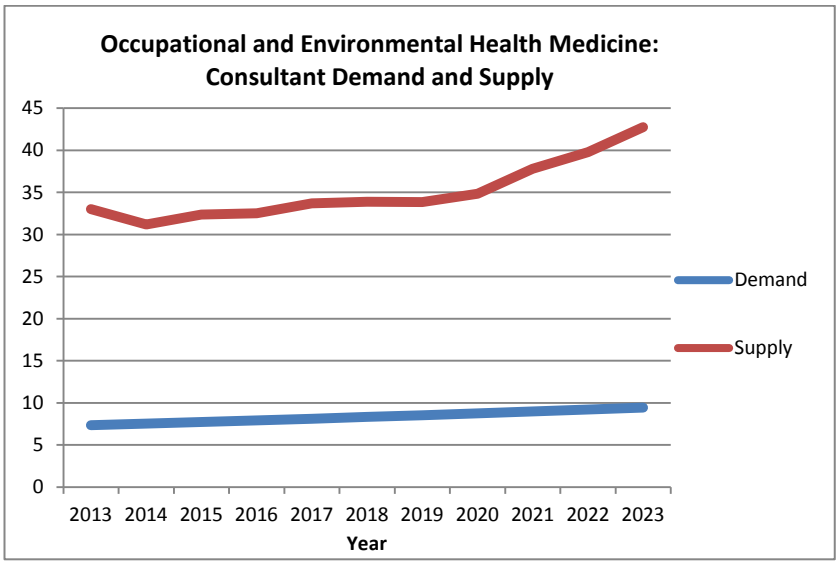
Neurology: Large volume of retirements expected (no growth in supply).



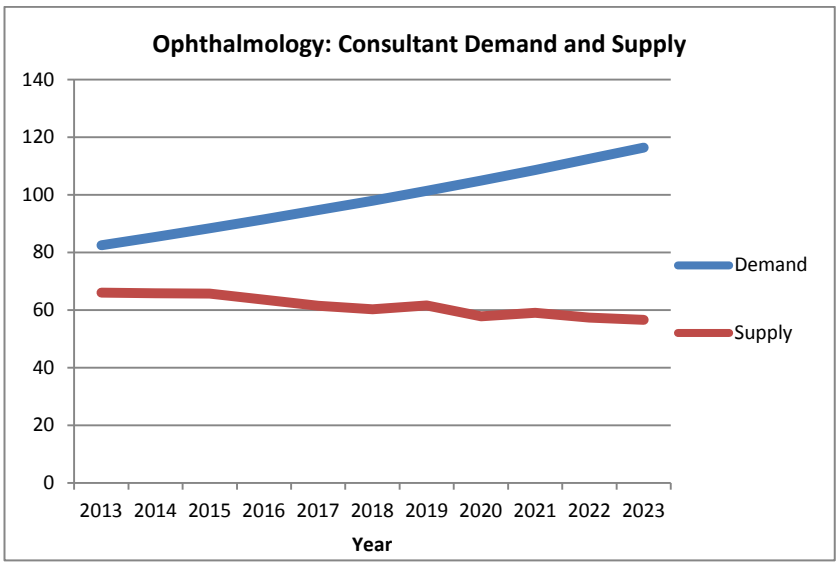
Neurosurgery: Undersupply and approaching retirements.



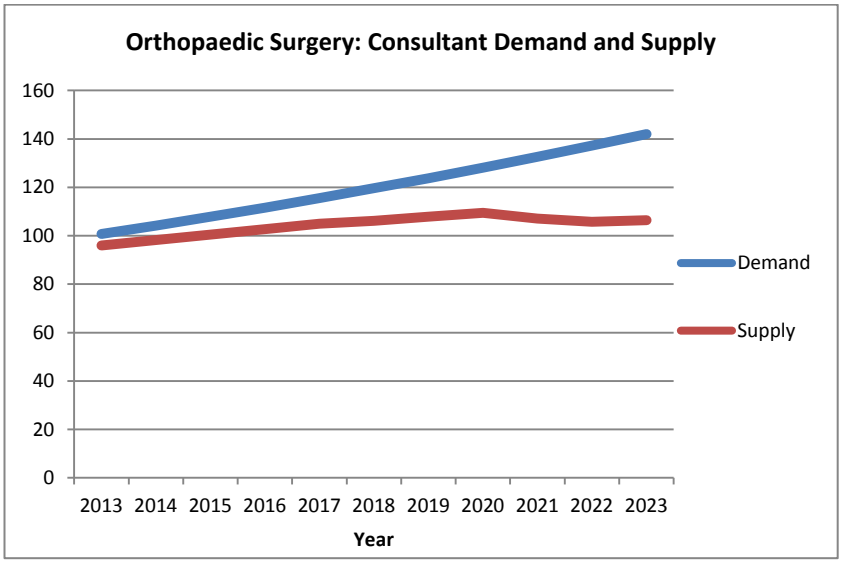
Obstetrics and Gynaecology: Major undersupply issues.



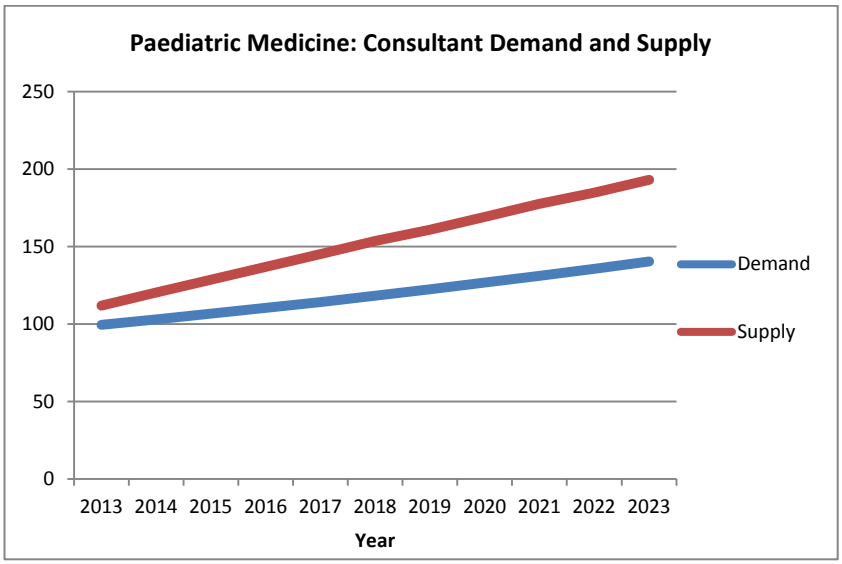
Occupation and Environmental Health Medicine: Oversupply and low volume patient/clients in private sector.



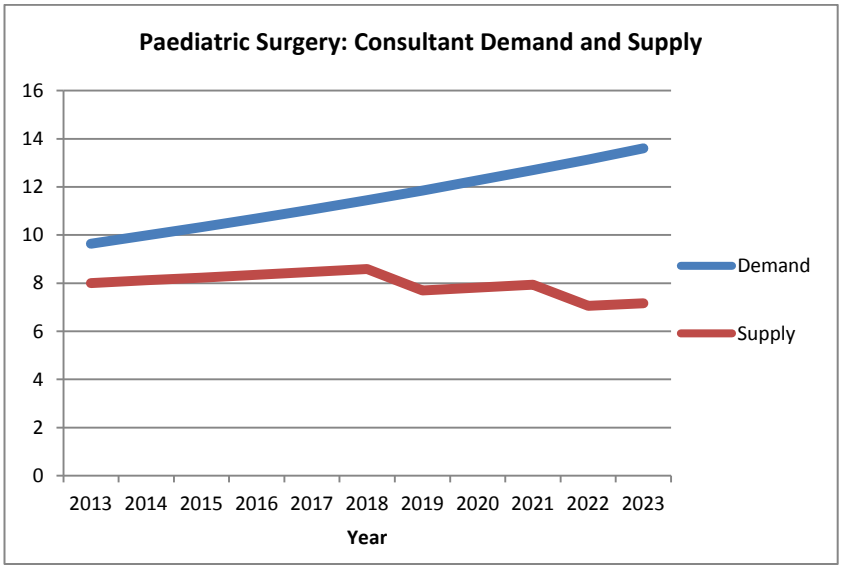
Ophthalmology: Undersupply and expected retirements (no growth in supply).



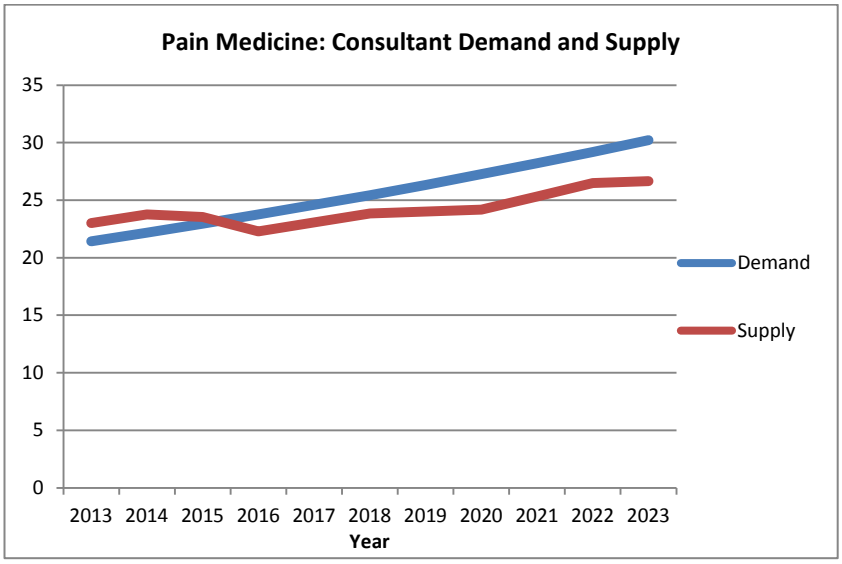
Orthopaedic Surgery: Undersupply.



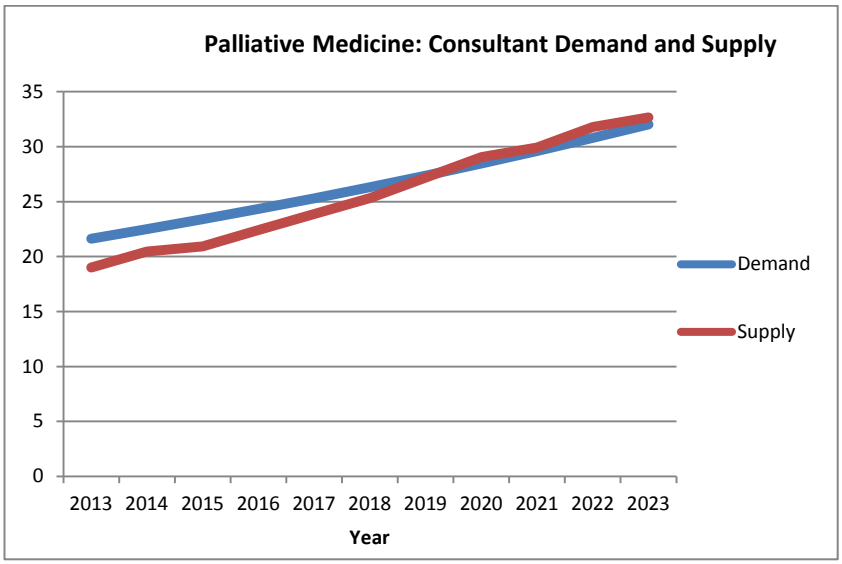
Paediatric Medicine: Oversupply and high trainee throughput (but shortfall in some subspecialties).



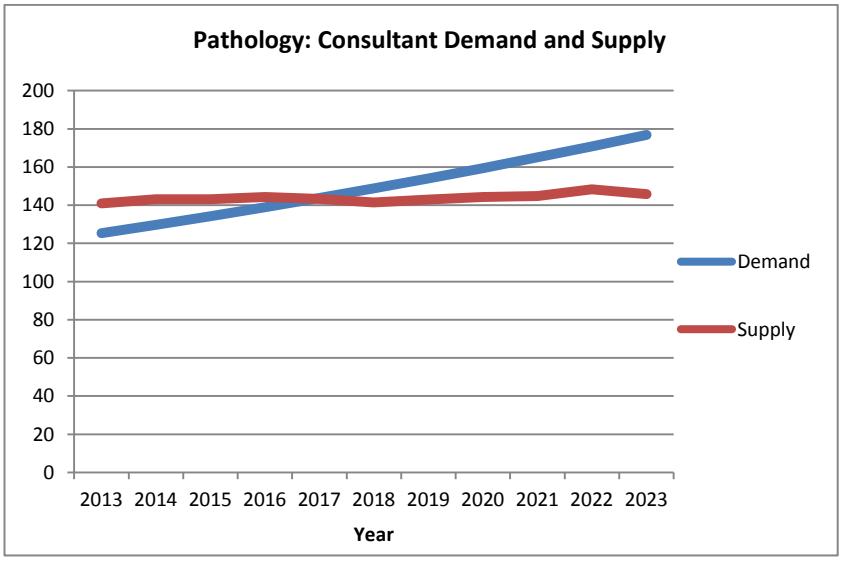
Paediatric Surgery: Undersupply and expected retirements.



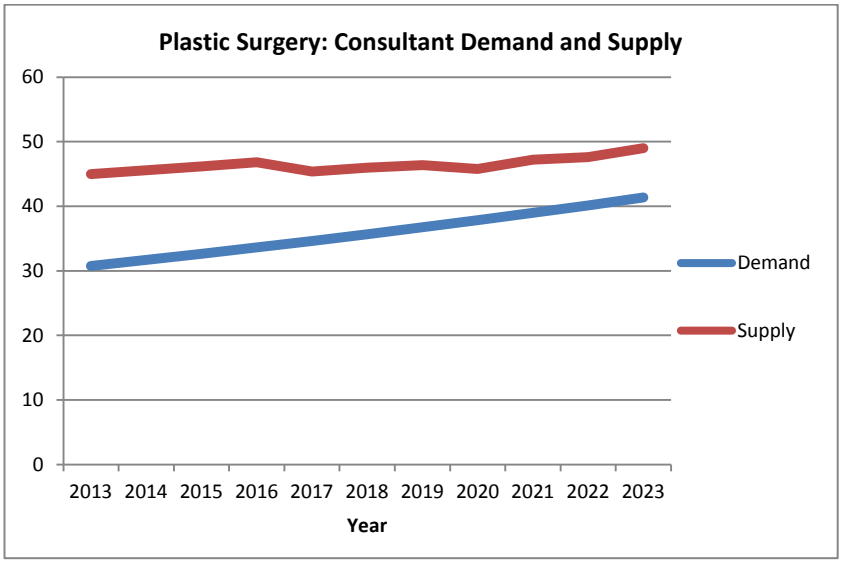
Pain Medicine: Large volume of unmet demand.



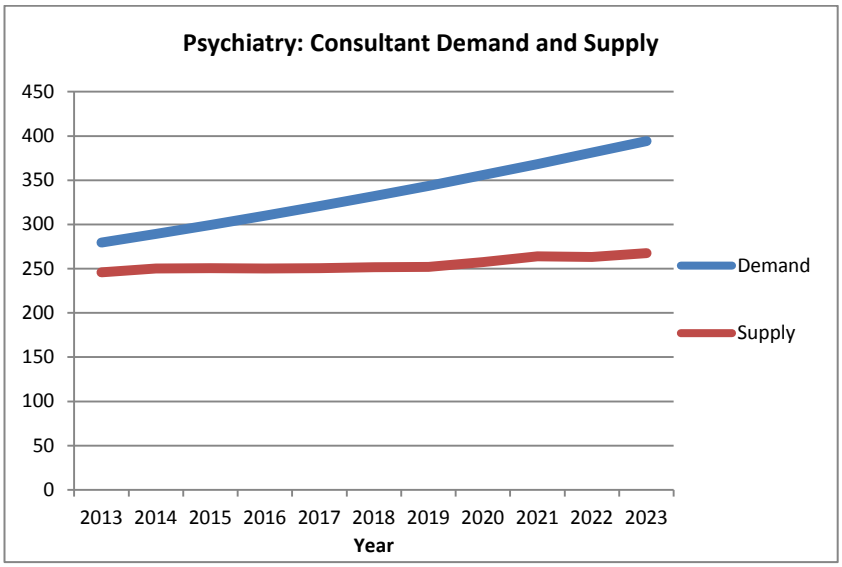
Palliative Care: Demand higher than indicated with subacute and non-acute activity not adequately included under ABF/M.



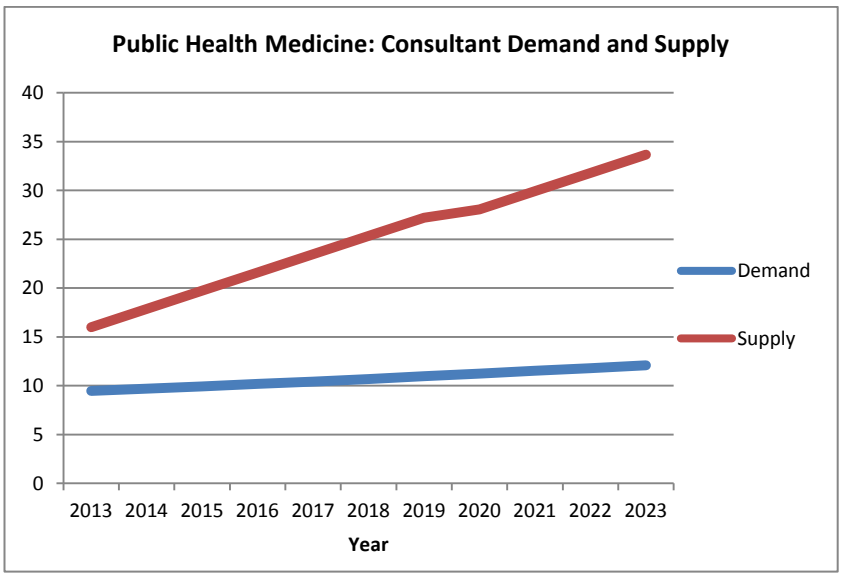
Pathology: Expected retirements (minimal growth in supply).



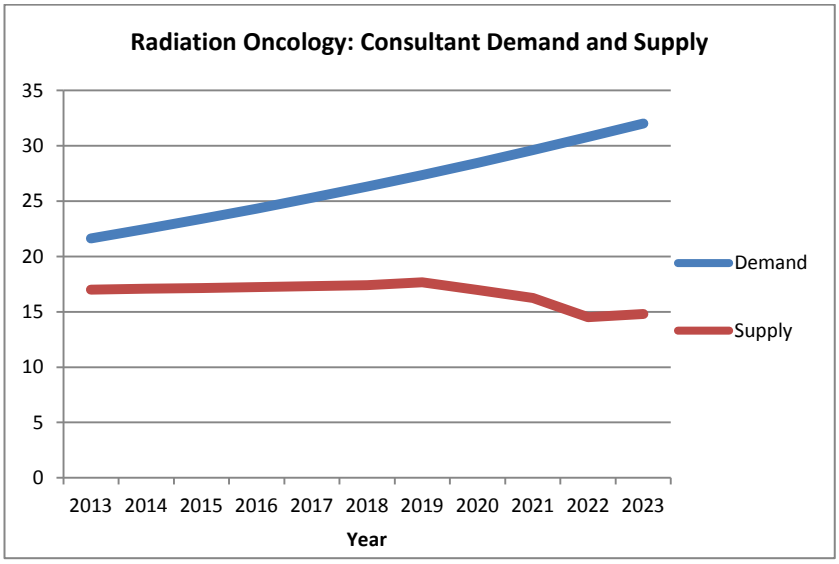
Plastic Surgery: Oversupply mainly in private sector.



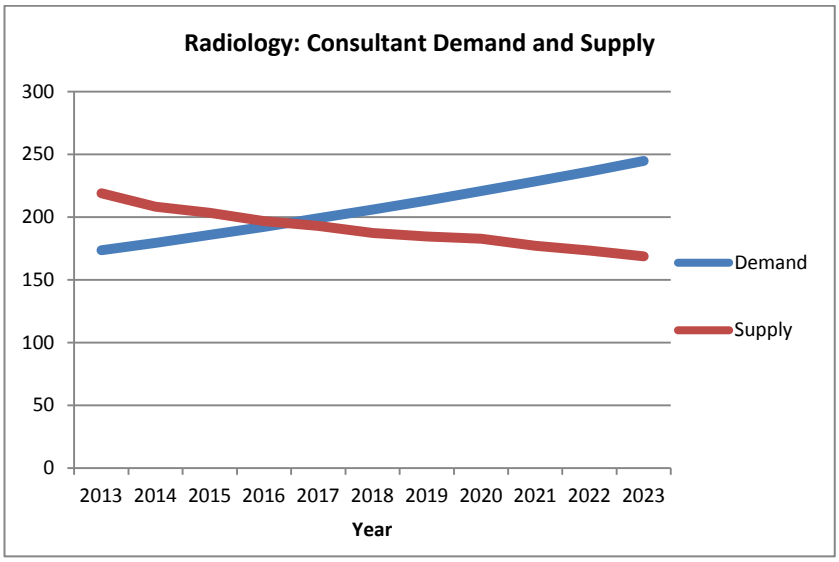
Psychiatry: Undersupply and expected retirements (minimal growth in supply).



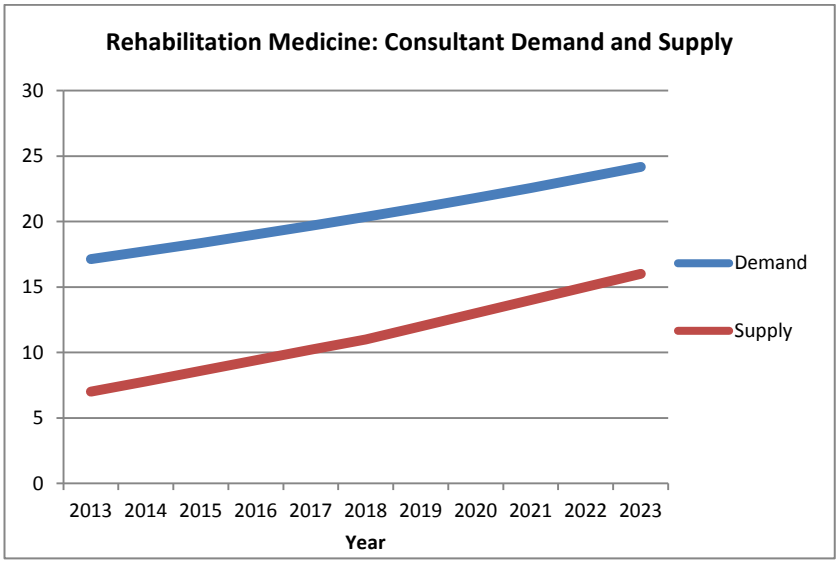
Public Health Medicine: Oversupply in metropolitan region, employment in Aboriginal health in rural and remote regions available.



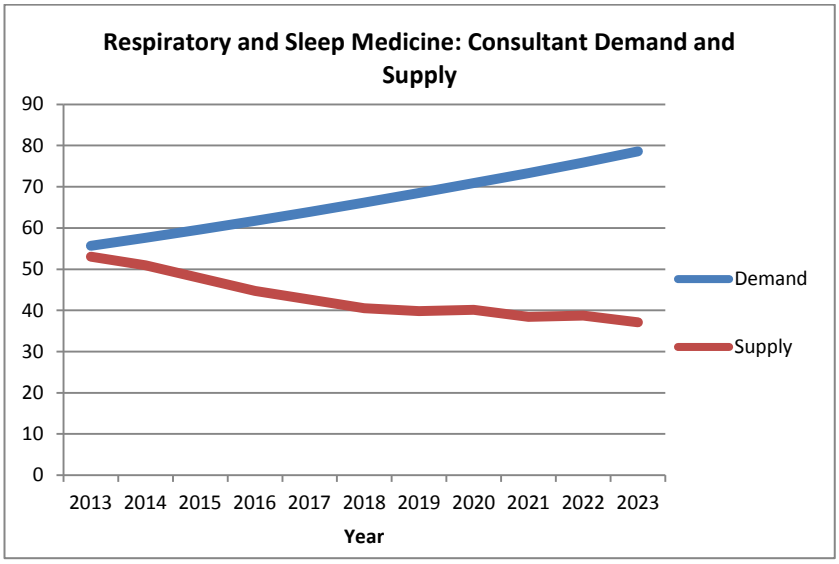
Radiation Oncology: Undersupply and significant volume of retirements expected.



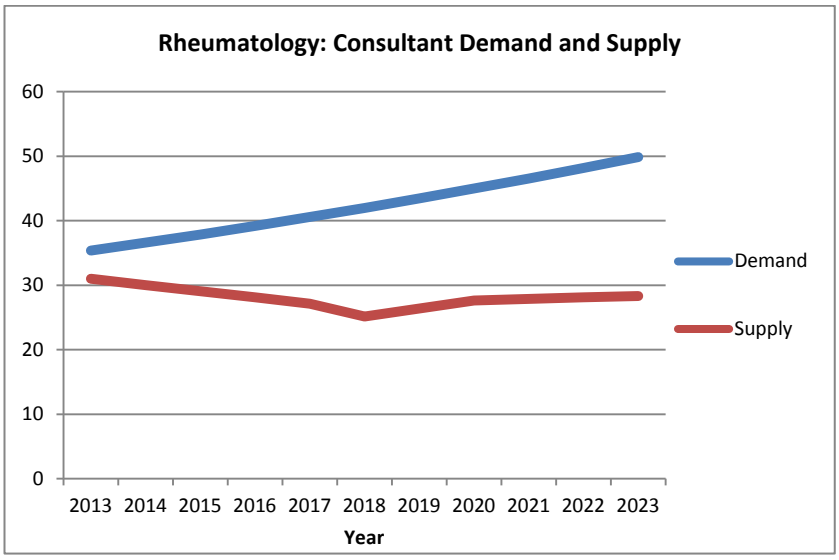
Radiology: Insufficient trainee throughput, large volume of retirements expected. Shortages in outer metropolitan and rural locations. Mainly in private sector. Supply also includes about 20 nuclear medicine physicians.



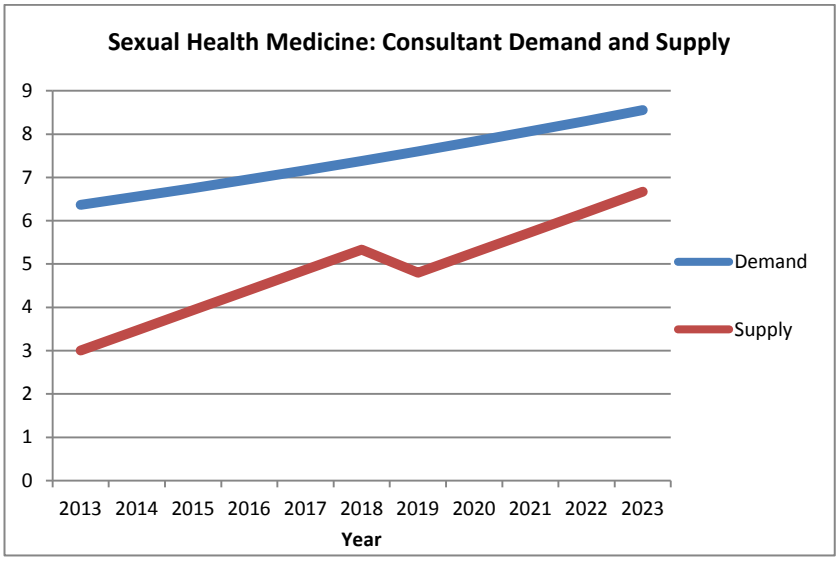
Rehabilitation: Large volume of activity performed by physiotherapy credited to rehabilitation consultants (An ABF/M issue).



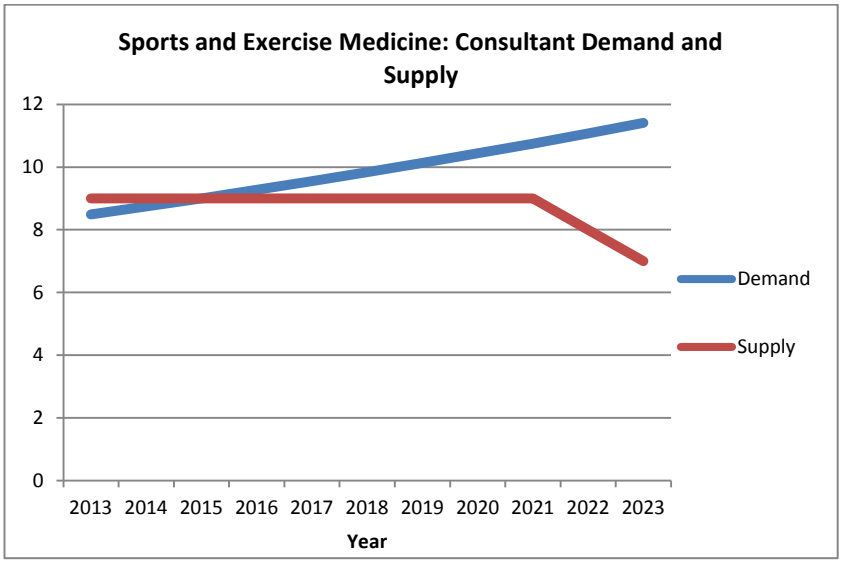
Respiratory and Sleep Medicine: Large volume of retirements expected (no growth in supply).



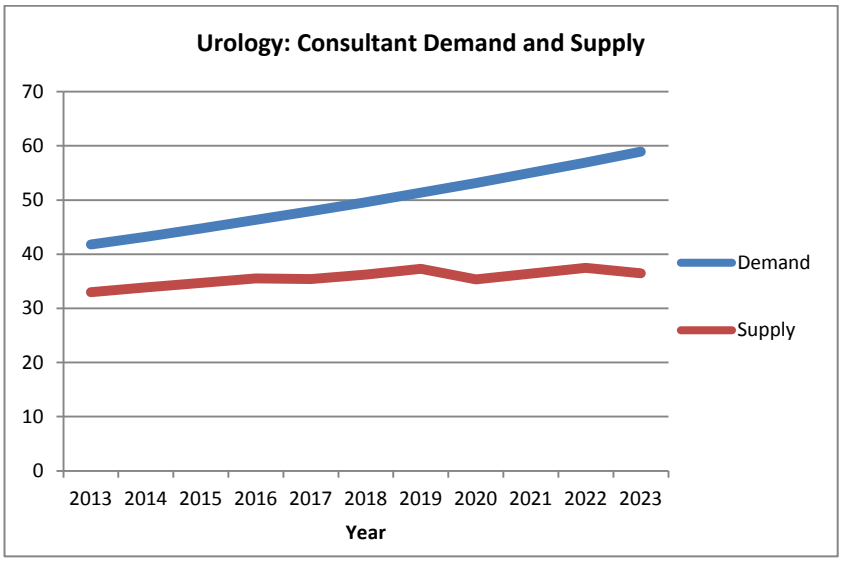
Rheumatology: Large volume of retirements expected and continued loss of staff (not restricted to consultants) to Singapore centre of excellence.



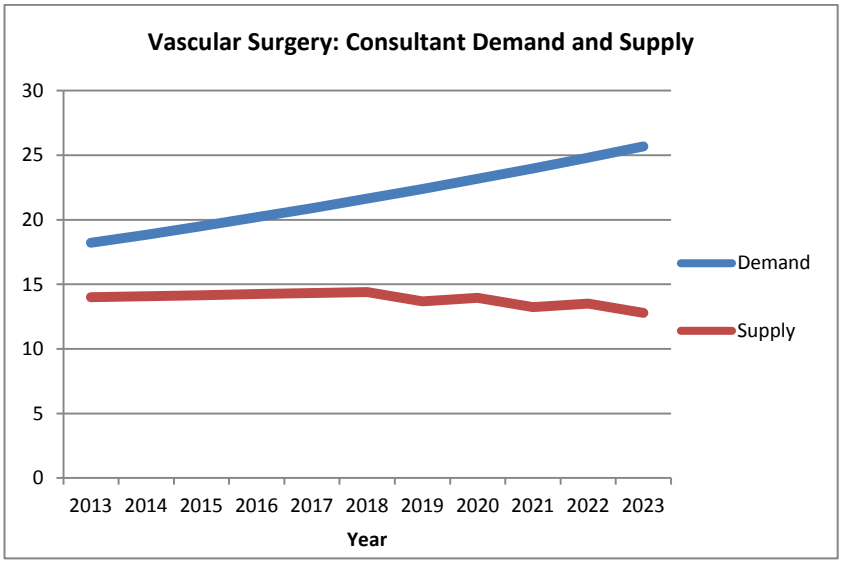
Sexual Health: Undersupply.



Sport and Exercise Medicine: Exclusively private sector with no identifiable hospital patient activity.



Urology: Undersupply and expected retirements with minimal growth in supply.



Vascular surgery: Undersupply and expected retirements (no growth in supply).

12. Standardised risk assessments for demand models

Prior to SWCP 2013, risk ratings for the DCIM and Specialist to Population Ratio (SPR) models were based on the simple shortfall estimate formula: number of specialists short divided by demand for specialists, expressed as a percentage. During SWCP 2013 it was identified that the existing risk assessment process had limitations and a standardised process would be required. The three main limitations that were identified for SWCP 2011 were:

- The demand model estimates for DCIM and SPR were being calculated for each specialty where possible but were interpreted as being equally predictive for each specialty. The DCIM model provides reliable estimates for hospital-dominant specialties and the SPR should only be used as an approximation for non-hospital dominant (private practice) specialties. SPR compensates for the absence of activity data reported in the private practice sector and is a method of last resort.
- Shortfall criteria of risk (critical, high, medium and low) were calculated using the identical formulae (number of specialists short divided by demand, and expressed as a percentage) but the DCIM and SPR estimates had different cut-off values for determination of their risk rating (critical, high, medium and low risk).
- The risk assessment labels, “critical risk”, ‘high risk”, “medium risk” and “low risk” were subjectively assessed and were not aligned with the risk of any event or consequence.

To address these issues the most common shortfall estimate formula was selected to facilitate direct comparison with other workforce planning studies and professional literature in terms of demand and supply.

Shortfall estimate equals: $\frac{supply\ of\ medical\ specialists}{demand\ for\ medical\ specialists}\ x\ 100\%$

The shortfall criterion to be used for all three demand models is specified as:

Shortfall criterion

Supply > demand	Low risk
Supply ≥ 90% Demand	Low risk
Supply ≥ 80% and < 90% Demand	Medium risk
Supply ≥ 70% and < 80% Demand	High risk
Supply <70% Demand	Critical risk

Selection of the cut-off values 70%, 80%, and 90% is based on the risk alignment of events and consequences experienced within the hospital setting.

Low Risk:

When supply of consultants > demand there is an oversupply. There is no difficulty in servicing patient demand (barring any extenuating issues such as a remote hospital location), no complex rostering of staff and no true waiting list (purely elective surgery excluded). Clearly this is a low risk shortfall of medical specialists.

Low Risk:

When supply of consultants is ≥ 90% demand, servicing patient demand is manageable. Some simple rostering of staff may be required, waiting lists may be measured in a few weeks and rescheduling of patients based on priority or severity is not an issue. This remains a low risk shortfall of medical specialists.

Medium Risk:

When supply of consultants is ≥ 80% and < 90% demand, servicing patient demand can become unmanageable and is noticeable by both staff and patients, creative rostering of staff is required, and waiting lists tend to increase and be measured in one to a few months if this shortfall is prolonged. Some staff may be looking for alternative employment opportunities. Additional support staff may absorb the impact of the consultant shortage. This is a medium or moderate risk shortfall of consultants.

High Risk:

When supply of consultants is ≥ 70% and < 80% demand, servicing patient demand is unmanageable and is clearly noticeable by both staff and patients, creative rostering of staff breaks down on a frequent basis exacerbating the situation and waiting lists can increase to several months and continue to grow. Many staff, including consultants, will be looking for alternative employment opportunities. Additional support staff will not resolve the consultant shortage. Additional consultants are required. This is a high risk shortfall of consultants.

Critical Risk:

When supply of medical specialists is < 70% demand (especially in surgical specialties) for any significant period of time, staff “burn-out”, “errors of judgement”, and ”corner cutting” can occur with increased frequency. Patients are at increased risk of not receiving treatment. At the hospital level there is a high risk of implosion of wards, clinics, units and departments. Consultant numbers can decrease further with increased likelihood of movement interstate, overseas, private practice, alternative employment or early retirement. It should also be noted that, for some medical specialties, a shortage of consultants below 70% can lead to very expensive cross-border referrals. The cost of purchasing a medical specialist may be high. However, the loss of funding revenue that can result from cross-border referrals generated by the shortfall (under the ABF/M framework) can be several times greater. This is a critical risk shortfall of medical specialists.

13. WAB model consultant demand, shortfall and risk assessment 2013 with projections for 2016 and 2021 (self-sufficiency scenario)

Specialty	2013				2016				2021			
	Demand	Short	%	Risk	Demand	Short	%	Risk	Demand	Short	%	Risk
Addiction Medicine	12	1	92	Low	13	1	92	Low	16	5	69	Crit
Anaesthesia	415	-4	101	Low	453	36	92	Low	525	71	86	Med
Cardiology	84	7	92	Low	93	19	80	Med	110	25	77	High
Cardiothoracic Surg.	13	2	85	Med	14	3	79	High	17	5	71	High
Clinical Genetics	8	1	88	Med	9	2	78	High	10	2	80	Med
Clinical Pharmacology	3	2	33	Crit	3	2	33	Crit	4	4	0	Crit
Dermatology	36	5	86	Med	40	11	73	High	48	17	65	Crit
Emergency Medicine	167	4	98	Low	185	2	99	Low	220	2	99	Low
Endocrinology	42	0	100	Low	47	5	89	Med	58	3	95	Low
ENT Surgery	50	12	76	High	56	21	63	Crit	66	30	55	Crit
Gastroenterology	72	12	83	Med	80	19	76	High	95	35	63	Crit
General Medicine	84	-13	115	Low	93	-14	115	Low	110	-25	123	Low
General Surgery	125	14	89	Med	139	25	82	Med	165	27	84	Med
Geriatric Medicine	50	-8	116	Low	56	-14	125	Low	66	-28	142	Low
Haematology	31	0	100	Low	34	9	74	High	41	16	61	Crit
Immunology	25	1	96	Low	27	6	78	High	32	10	69	Crit
Infectious Disease	19	-4	121	Low	22	-5	123	Low	27	-5	119	Low
Intensive Care	51	-1	102	Low	56	-3	105	Low	68	-11	116	Low
Medical Admin.	17	-9	153	Low	18	0	100	Low	20	5	75	High
Medical Oncology	42	5	86	Med	47	9	81	Med	58	13	78	High
Neonatal Medicine	19	-2	111	Low	21	-13	162	Low	25	-29	216	Low
Nephrology	42	9	79	High	47	11	77	High	58	13	78	High
Neurology	42	2	93	Low	46	7	85	Med	55	18	67	Crit
Neurosurgery	21	5	76	High	24	8	67	Crit	28	11	61	Crit
Obstet. & Gynaecology	157	36	77	High	175	58	67	Crit	205	77	62	Crit
Occ. & Environ. Health	8	-25	413	Low	6	-23	483	Low	6	-31	617	Low
Ophthalmology	82	16	80	Med	91	31	66	Crit	109	52	52	Crit
Orthopaedic Surgery	101	5	95	Low	112	11	90	Low	133	31	77	High
Paediatric Medicine	100	-12	112	Low	110	-16	115	Low	131	-30	123	Low
Paediatric Surgery	10	2	80	Med	11	3	73	High	13	6	54	Crit
Pain Medicine	21	-2	110	Low	24	3	88	Med	28	3	89	Med
Palliative Care	22	3	86	Med	24	2	92	Low	30	0	100	Low
Pathology	125	-16	113	Low	139	3	98	Low	165	20	88	Med
Plastic Surgery	31	-14	145	Low	34	-9	126	Low	39	-7	118	Low
Psychiatry	280	34	88	Med	310	74	76	High	368	116	68	Crit
Public Health	9	-7	178	Low	10	-12	220	Low	12	-18	250	Low
Radiation Oncology	22	5	77	High	24	7	71	High	30	16	47	Crit
Radiology	174	-45	126	Low	192	-10	105	Low	229	23	90	Low
Rehab. Medicine	17	10	41	Crit	19	10	47	Crit	23	9	61	Crit
Resp. & Sleep Med.	56	3	95	Low	62	21	66	Crit	73	35	52	Crit
Rheumatology	35	4	89	Med	39	14	64	Crit	47	20	57	Crit
Sexual Health	6	3	50	Crit	7	3	57	Crit	8	2	75	High
Sport & Exercise Med.	8	-1	112	Low	9	0	100	Low	11	3	73	High
Urology	42	9	79	High	46	12	74	High	55	19	65	Crit
Vascular Surgery	18	4	78	High	20	6	70	High	24	11	54	Crit

14. Trainee supply versus retirement and growth in service based demand

A bar graph with two columns per year is provided for each specialty beginning from 2014:

- The first column is supply, indicating the number of new consultants (purple) plus any excesses prior to 2013 (green). Any excess is not distributed over any more than the 2014 year, as unemployed new consultants from a prior year tend to seek alternative employment.
- The second column is demand, which depicts growth in service delivery based demand (blue), retirement based demand (red) and the shortfall from 2013 (green). The shortfall may be distributed over more than one year (for development of an optimal replacement strategy) but appears only in the 2014 column in this case. By comparing the level of shortfall with the annual rate of increase in consultants it is possible to demonstrate the length of time that the shortfall has not been sufficiently addressed.

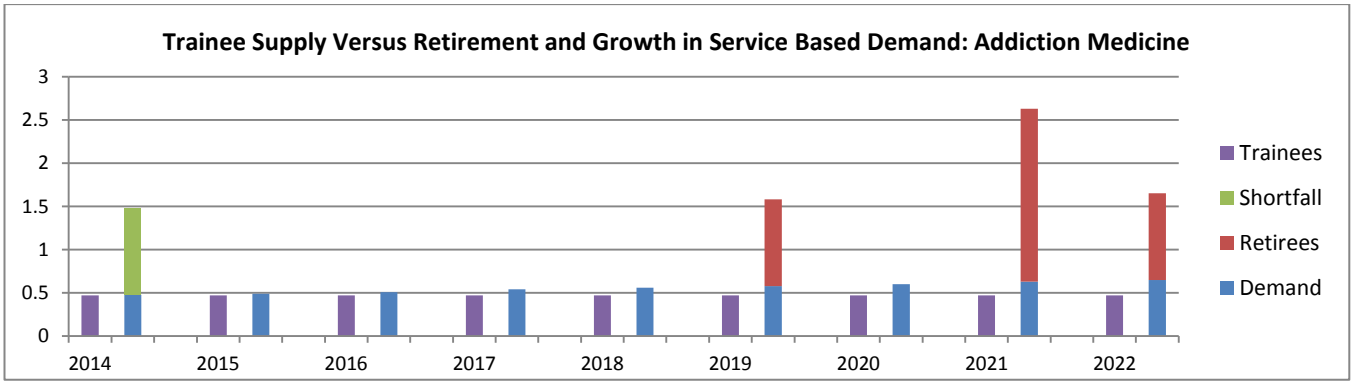
Addiction Medicine

Current trainee throughput: **0.47** per annum

Shortfall from 2013: **1**

Growth in service based demand **0.48** increasing to **0.65** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



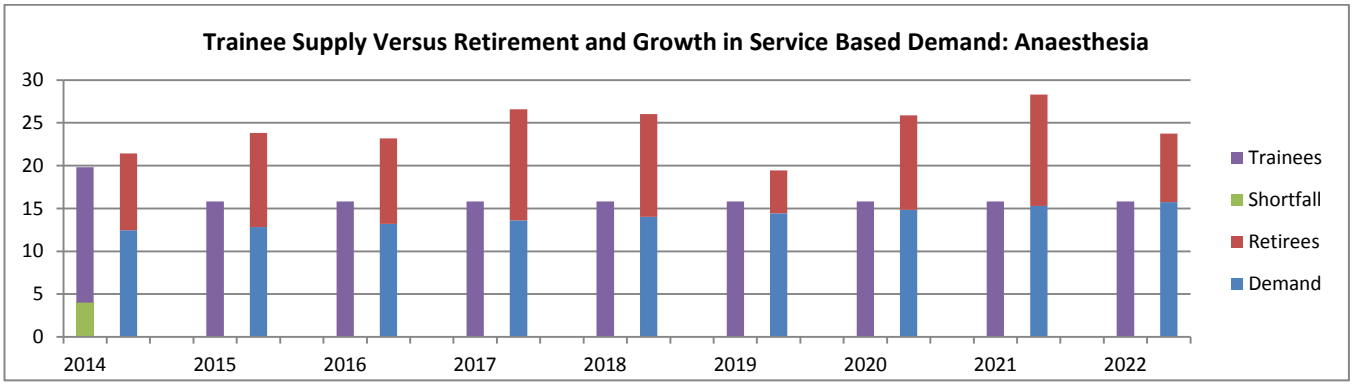
Anaesthesia

Current trainee throughput: **15.8** per annum

Excess from 2013: **4**

Growth in service based demand **12.4** increasing to **15.8** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



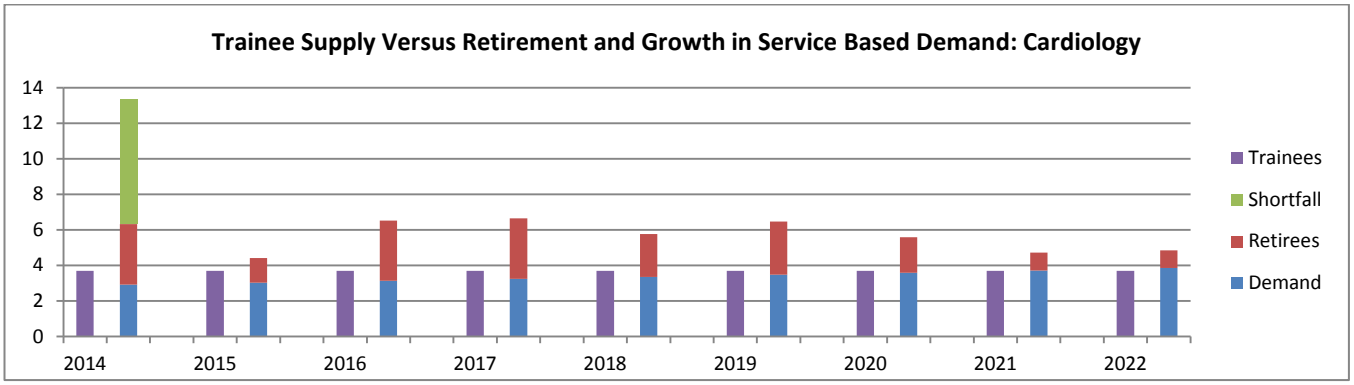
Cardiology

Current trainee throughput: **3.7** per annum

Shortfall from 2013: **7**

Growth in service based demand **2.92** increasing to **3.85** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



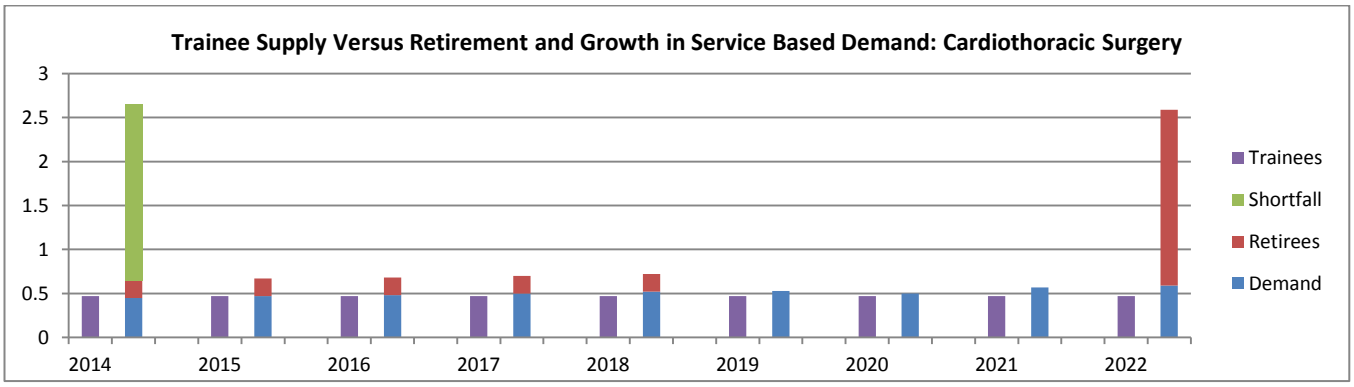
Cardiothoracic Surgery

Current trainee throughput: **0.47** per annum

Shortfall from 2013: **2**

Growth in service based demand **0.45** increasing to **0.59** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



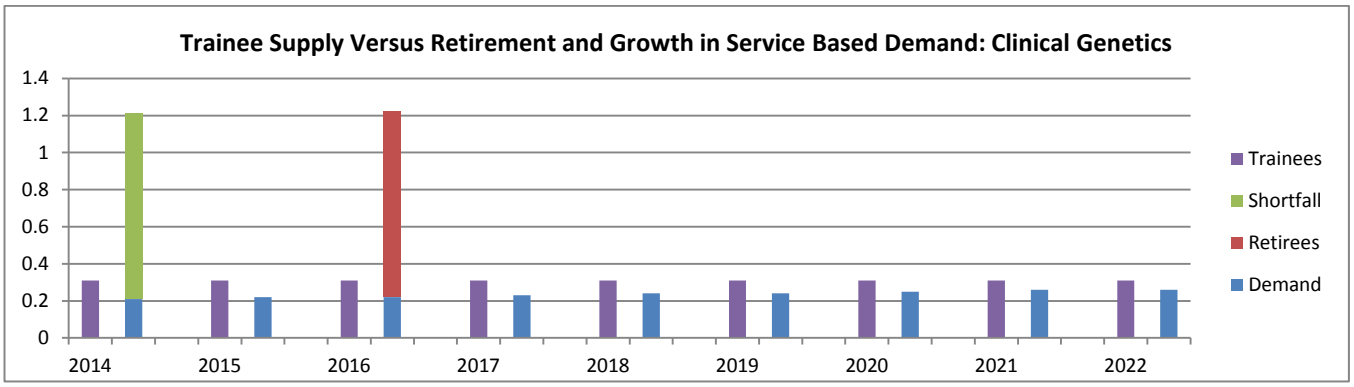
Clinical Genetics

Current trainee throughput: **0.31** per annum

Shortfall from 2013: **1**

Growth in service based demand **0.21** increasing to **0.26** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



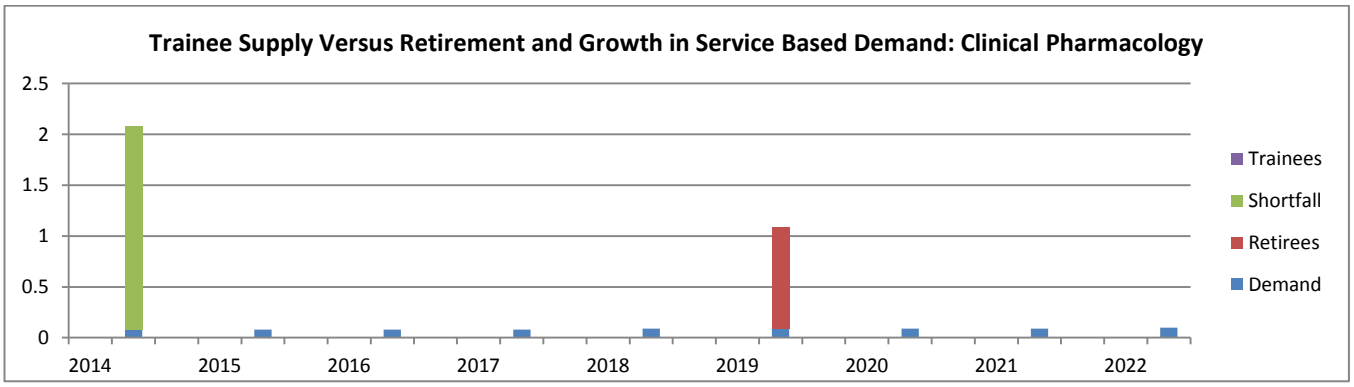
Clinical Pharmacology

Current trainee throughput: **nil**

Shortfall from 2013: **2**

Growth in service based demand **0.08** increasing to **0.10** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



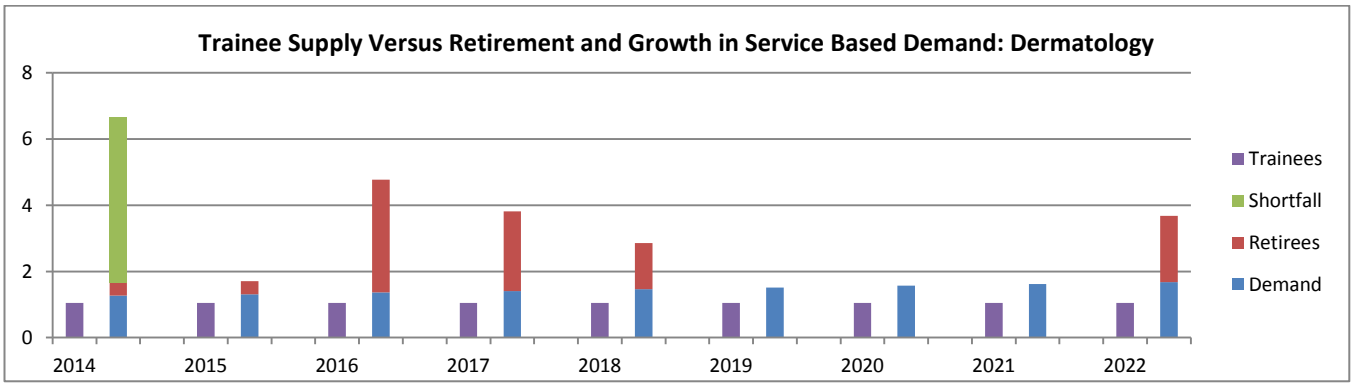
Dermatology

Current trainee throughput: **1.05** per annum

Shortfall from 2013: **5**

Growth in service based demand **1.27** increasing to **1.68** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



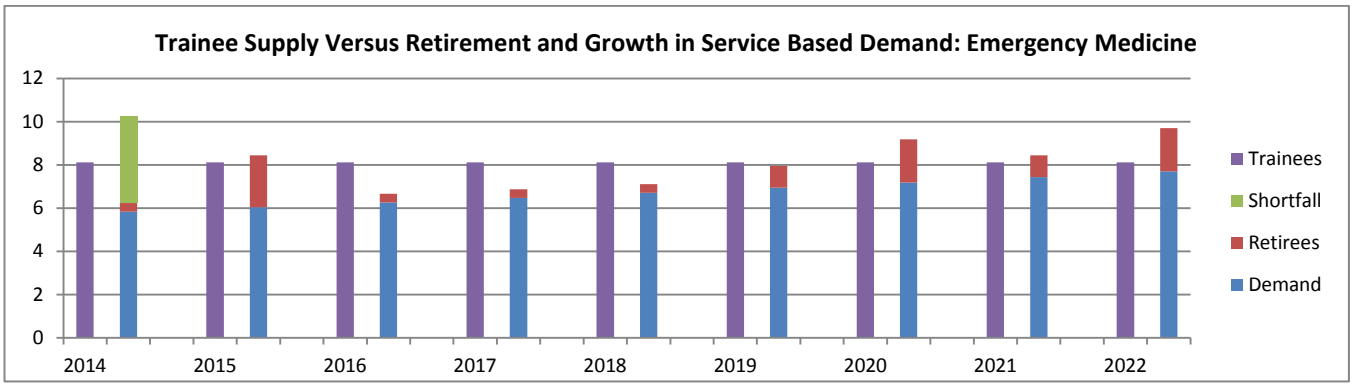
Emergency Medicine

Current trainee throughput: **8.12** per annum

Shortfall from 2013: **4**

Growth in service based demand **5.84** increasing to **7.70** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



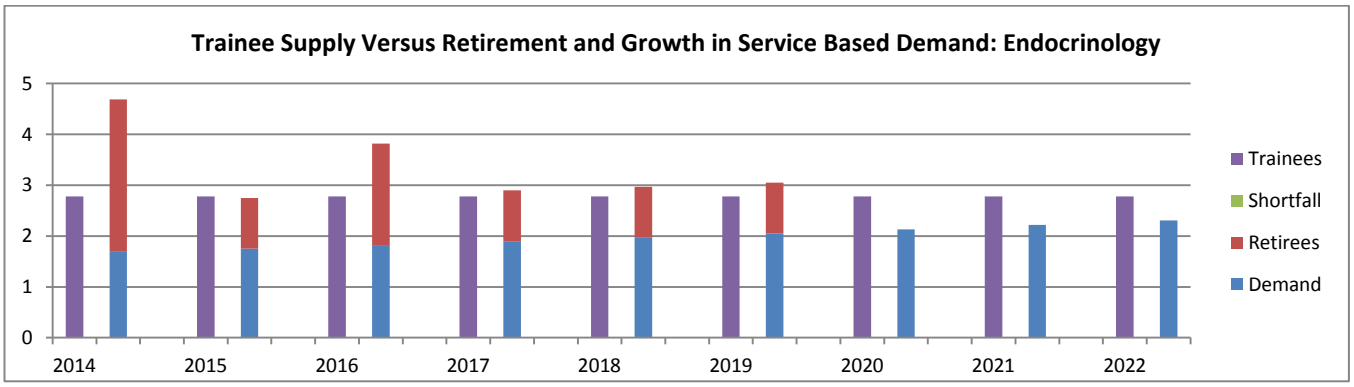
Endocrinology

Current trainee throughput: **2.78** per annum

Shortfall from 2013: **nil**

Growth in service based demand **1.69** increasing to **2.32** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



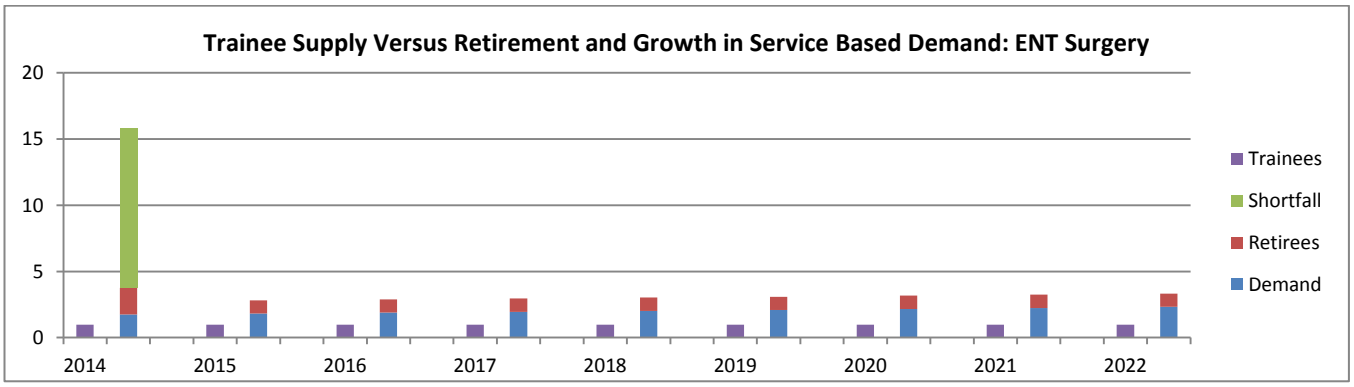
ENT Surgery

Current trainee throughput: **0.98** per annum

Shortfall from 2013: **12**

Growth in service based demand **1.76** increasing to **2.32** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



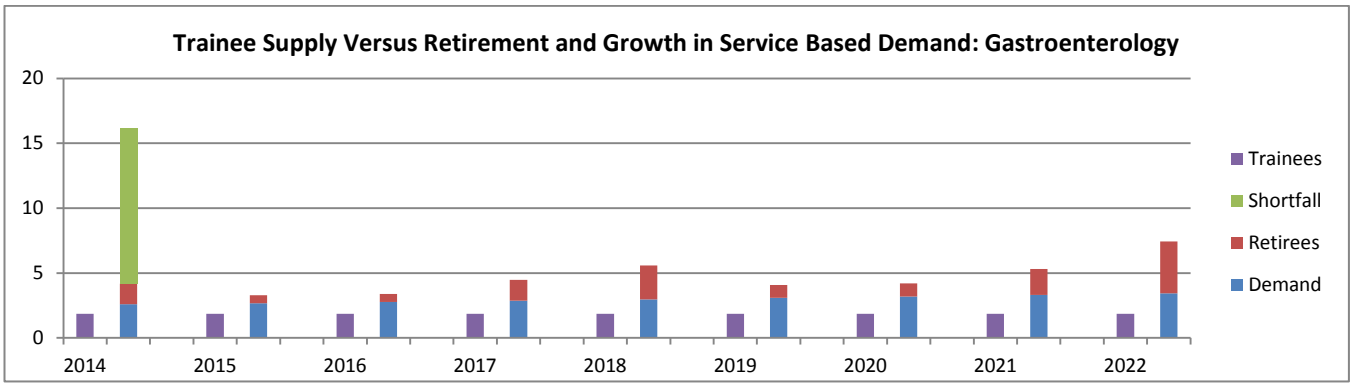
Gastroenterology

Current trainee throughput: **1.87** per annum

Shortfall from 2013: **12**

Growth in service based demand **2.59** increasing to **3.44** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



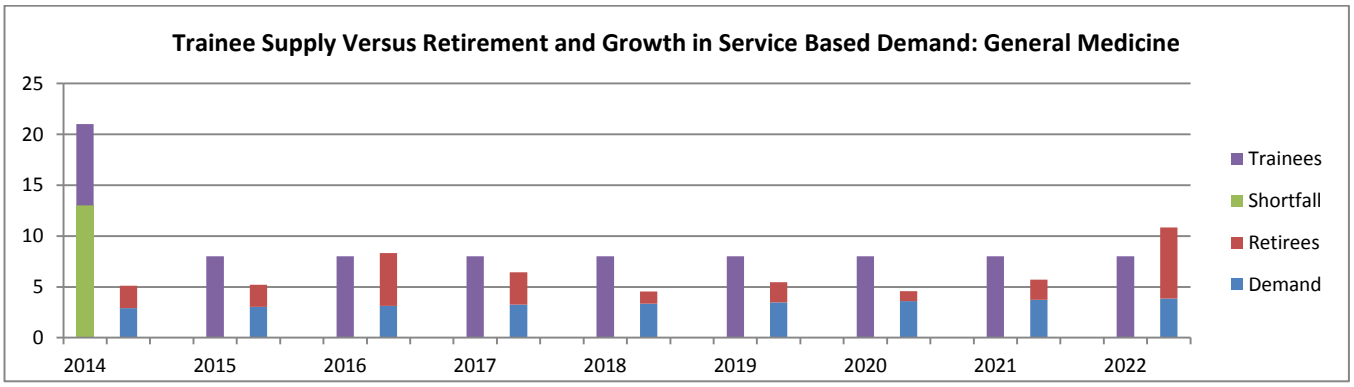
General Medicine

Current trainee throughput: **8.02** per annum

Excess from 2013: **13**

Growth in service based demand **2.92** increasing to **3.85** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



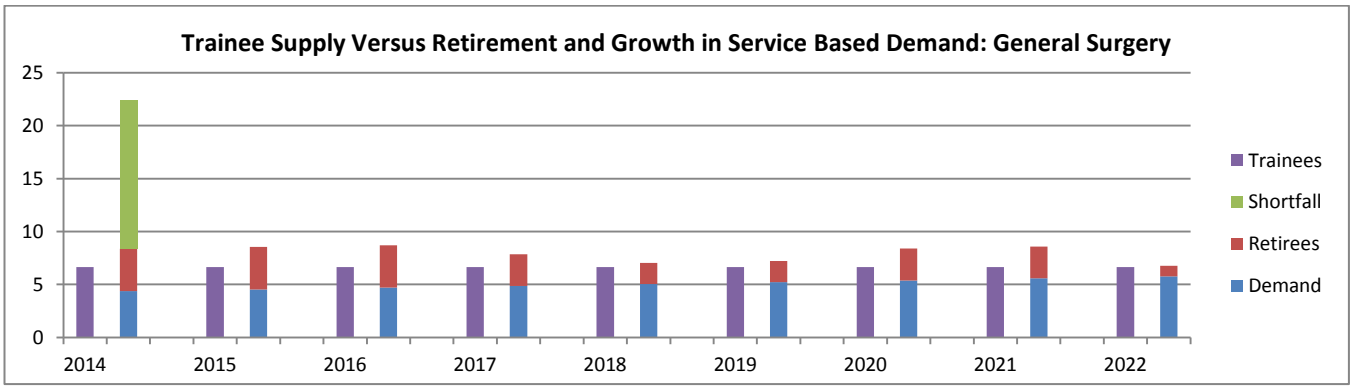
General Surgery

Current trainee throughput**:** **6.66** per annum

Shortfall from 2013: **14**

Growth in service based demand **4.38** increasing to **5.78** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



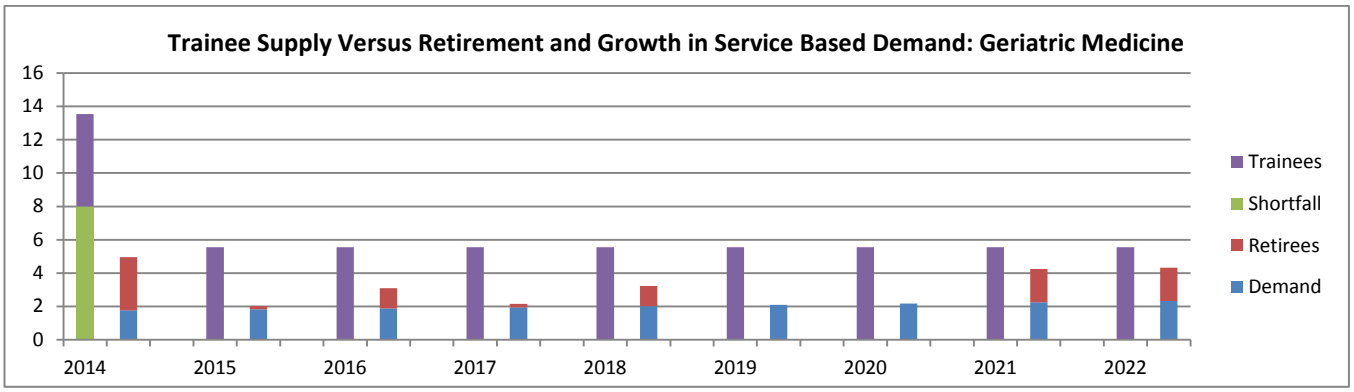
Geriatric Medicine

Current trainee throughput: **5.55** per annum

Excess from 2013: **8**

Growth in service based demand **1.76** increasing to **2.32** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



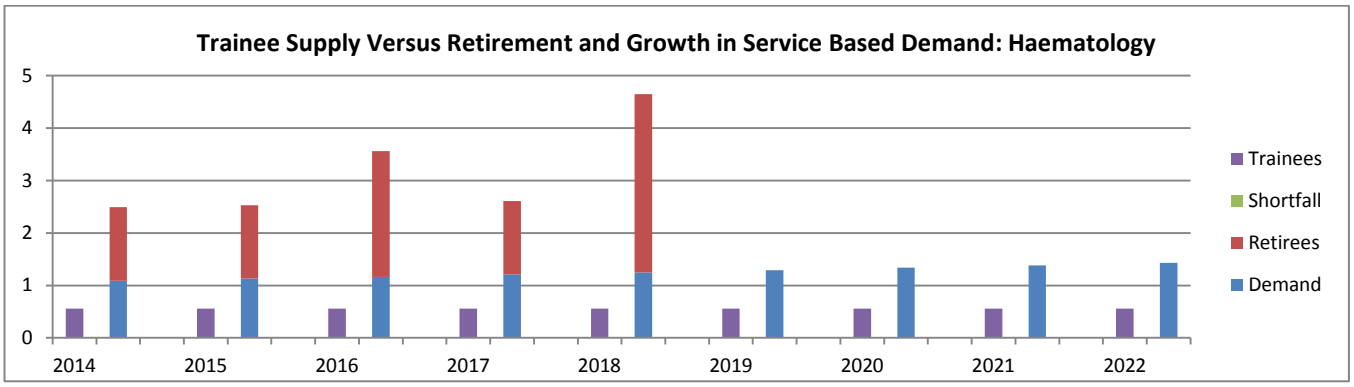
Haematology

Current trainee throughput: **0.56** per annum

Shortfall from 2013: **nil**

Growth in service based demand **1.09** increasing to **1.43** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



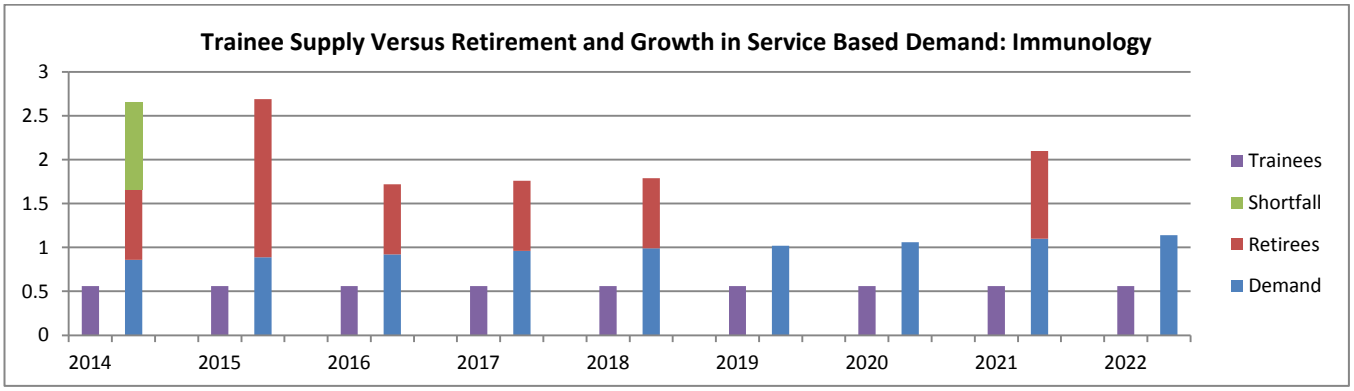
Immunology

Current trainee throughput: **0.56** per annum

Shortfall from 2013: **1**

Growth in service based demand **0.86** increasing to **1.14** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



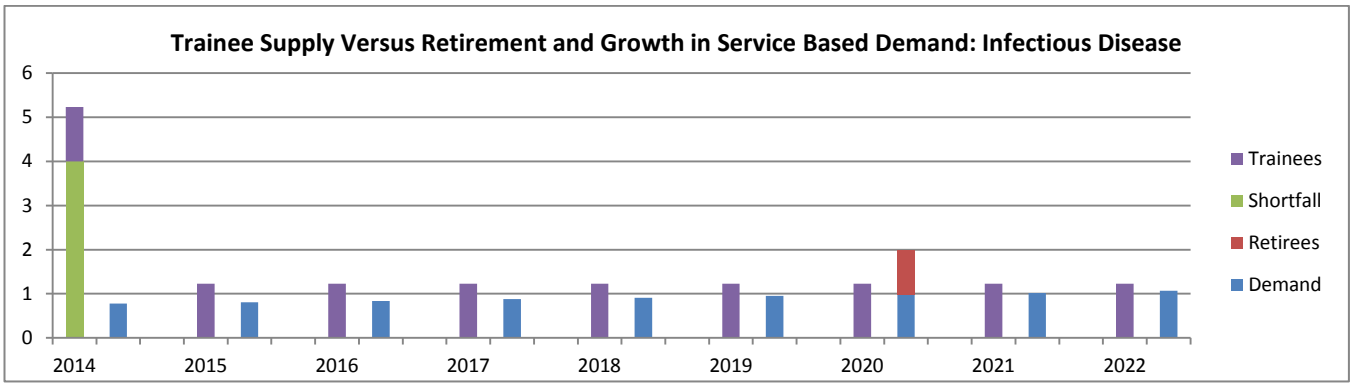
Infectious Disease

Current trainee throughput: **1.23** per annum

Excess from 2013: **4**

Growth in service based demand **0.78** increasing to **1.07** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



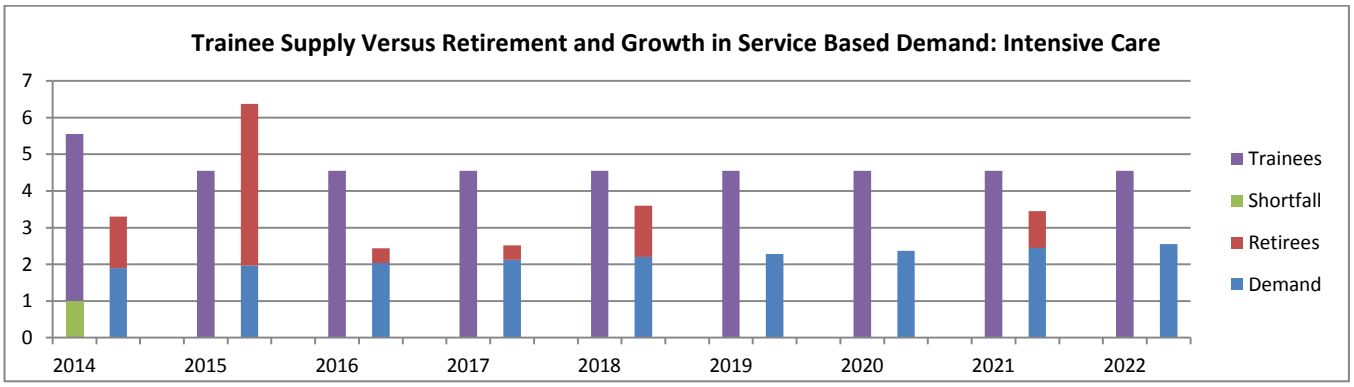
Intensive Care Medicine

Current trainee throughput: **4.55** per annum

Excess from 2013: **1**

Growth in service based demand **1.90** increasing to **2.55** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



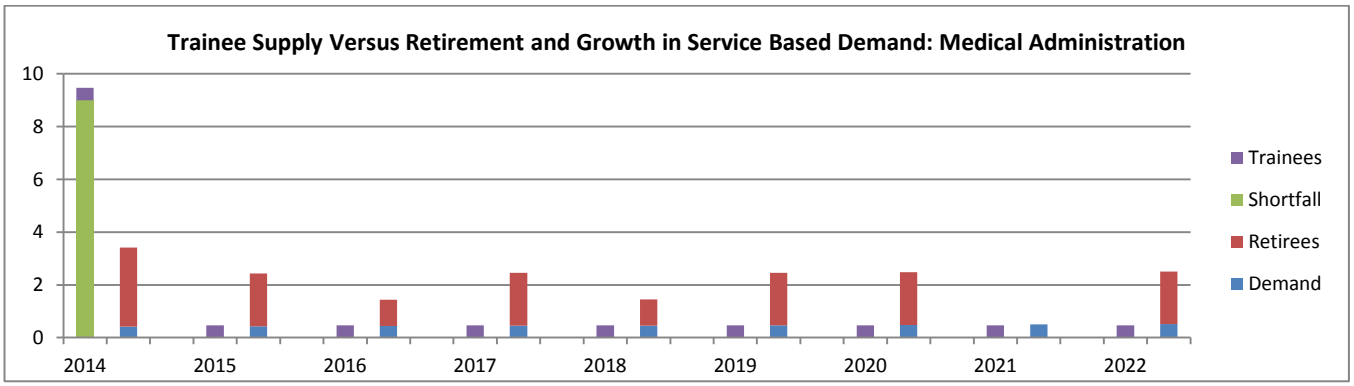
Medical Administration

Current trainee throughput: **0.47** per annum

Excess from 2013: **9**

Growth in service based demand **0.42** increasing to **0.51** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



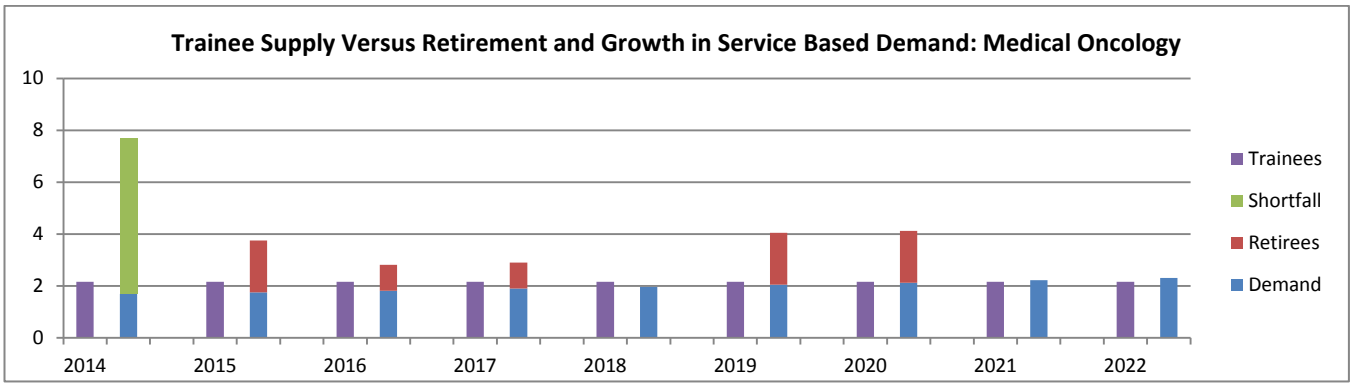
Medical Oncology

Current trainee throughput: **2.16** per annum

Shortfall from 2013: **6**

Growth in service based demand **1.69** increasing to **2.31** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



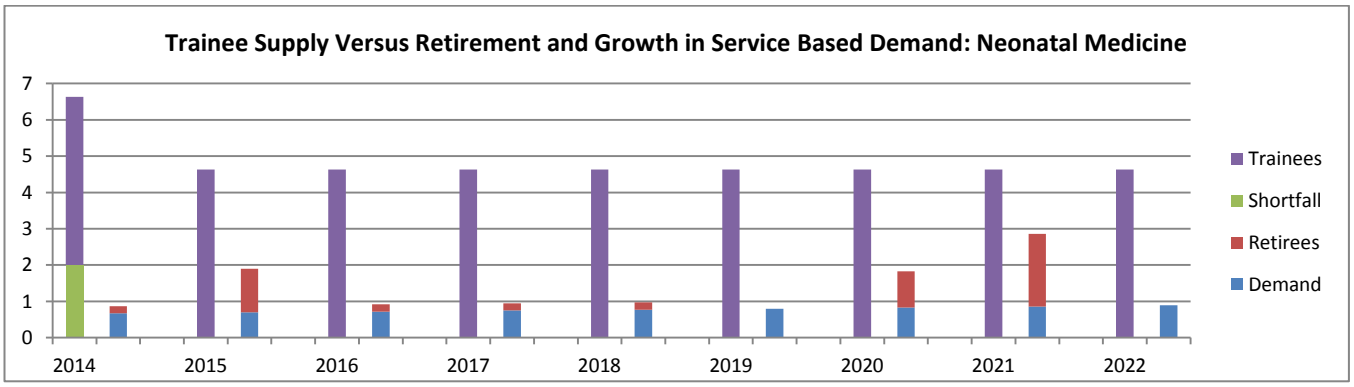
Neonatal Medicine

Current trainee throughput: **4.63** per annum

Excess from 2013: **2**

Growth in service based demand **0.67** increasing to **0.89** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



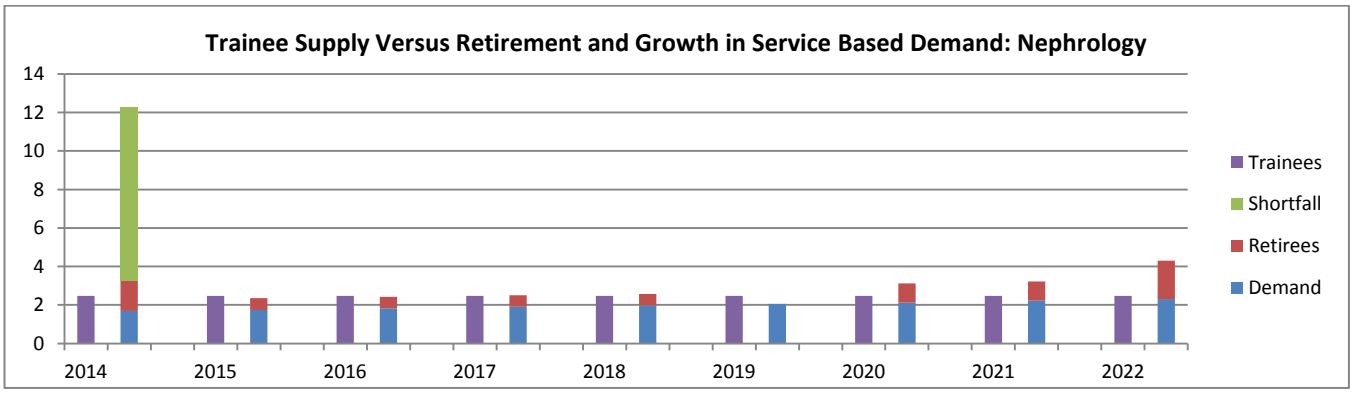
Nephrology

Current trainee throughput: **2.47** per annum

Shortfall from 2013: **9**

Growth in service based demand **1.69** increasing to **2.31** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



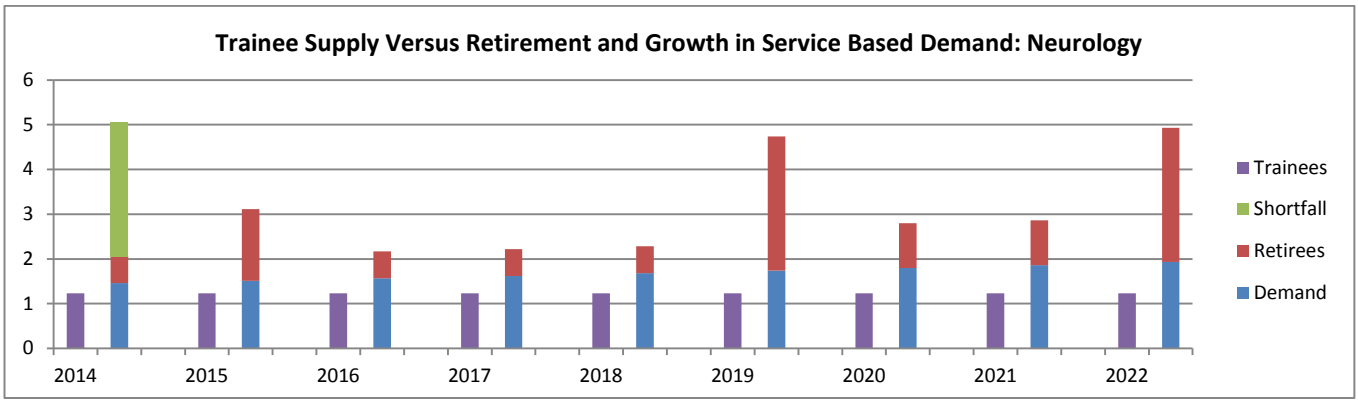
Neurology

Current trainee throughput: **1.23** per annum

Shortfall from 2013: **3**

Growth in service based demand **1.46** increasing to **1.93** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



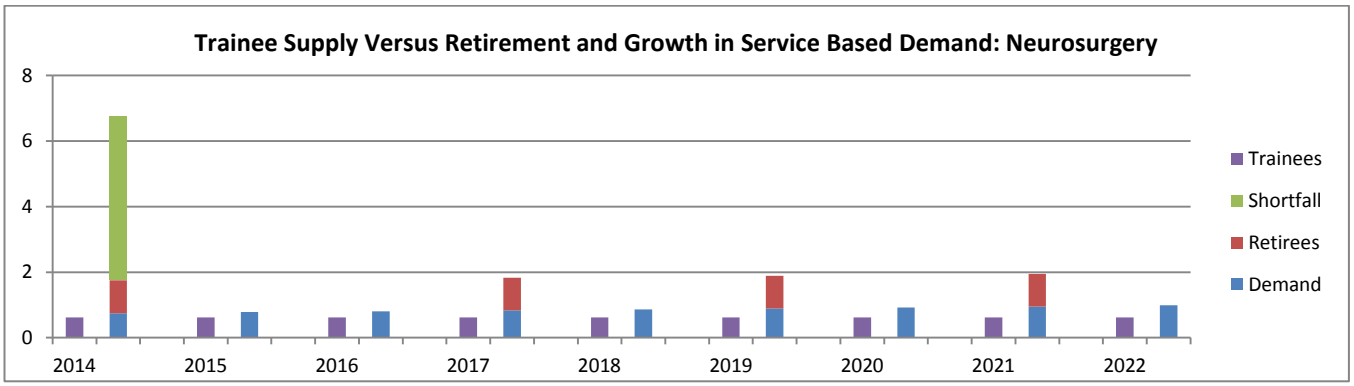
Neurosurgery

Current trainee throughput: **0.62** per annum

Shortfall from 2013: **5**

Growth in service based demand **0.75** increasing to **0.99** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



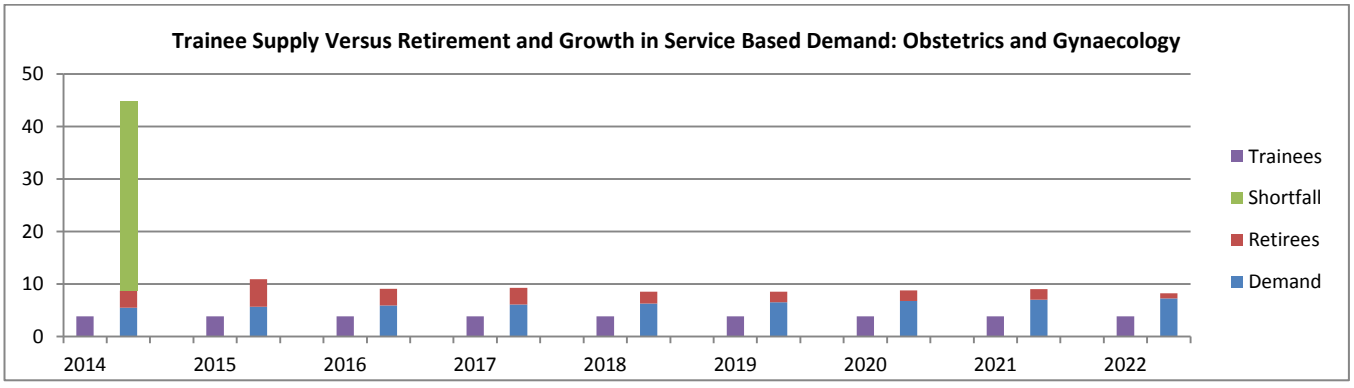
Obstetrics and Gynaecology

Current trainee throughput: **3.85** per annum

Shortfall from 2013: **36**

Growth in service based demand **5.51** increasing to **7.26** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



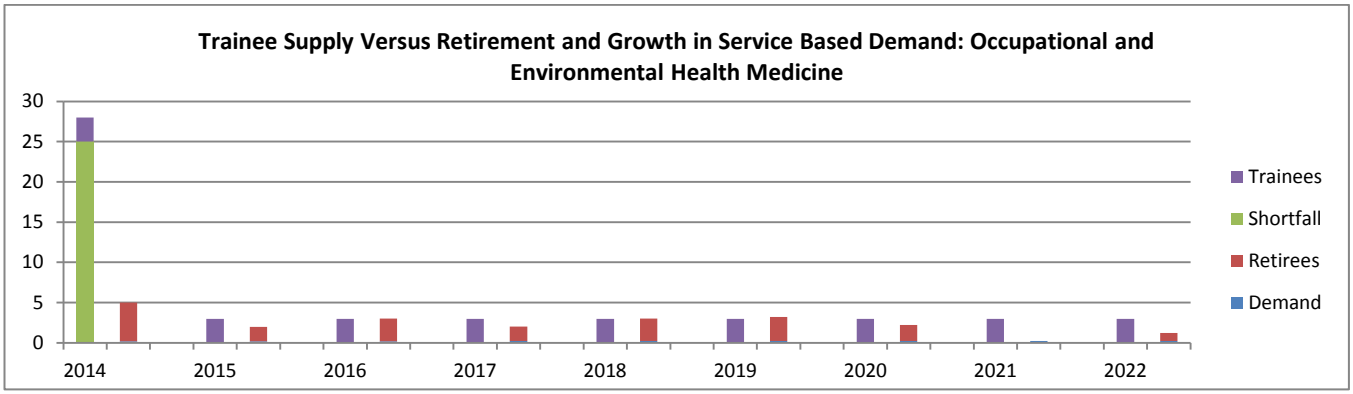
Occupational and Environmental Health Medicine

Current trainee throughput**:** **2.98** per annum

Excess from 2013: **25**

Growth in service based demand **0.18** increasing to **2.22** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



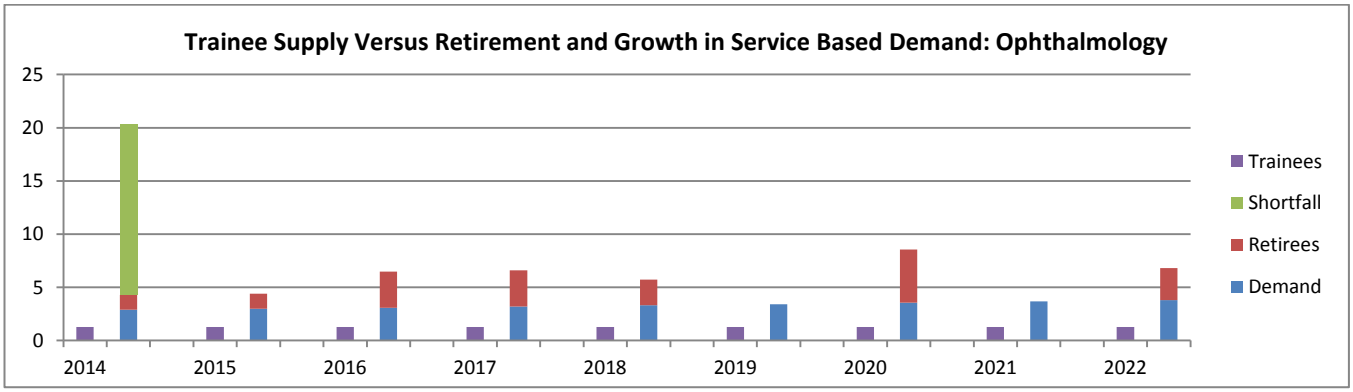
Ophthalmology

Current trainee throughput: **1.26** per annum

Shortfall from 2013: **16**

Growth in service based demand **2.89** increasing to **3.80** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



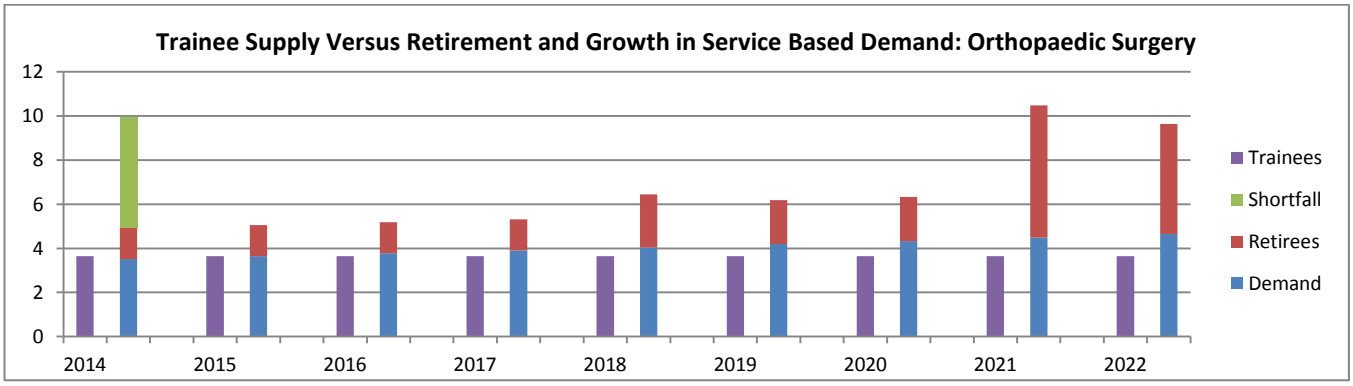
Orthopaedic Surgery

Current trainee throughput: **3.64** per annum

Shortfall from 2013: **5**

Growth in service based demand **3.52** increasing to **4.64** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



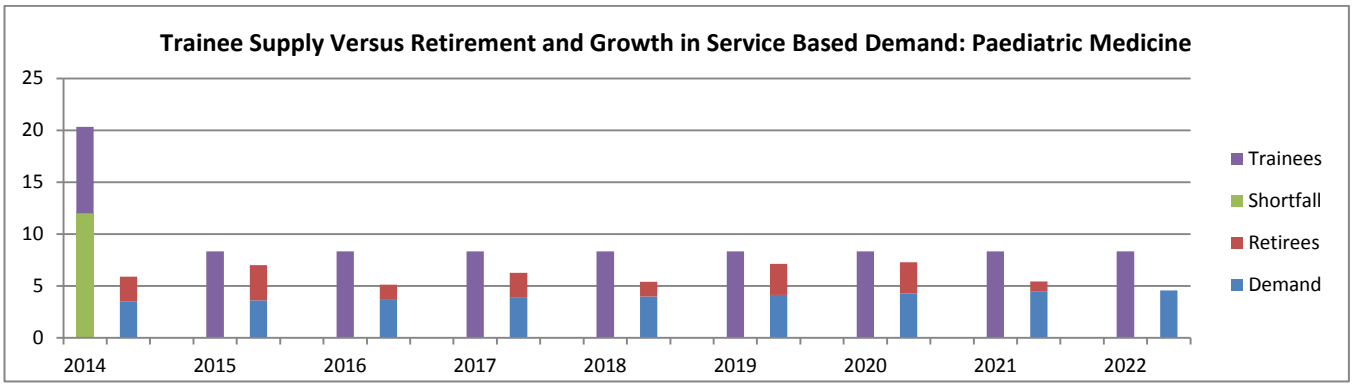
Paediatric Medicine

Current trainee throughput: **8.33** per annum

Excess from 2013: **12**

Growth in service based demand **3.49** increasing to **4.59** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



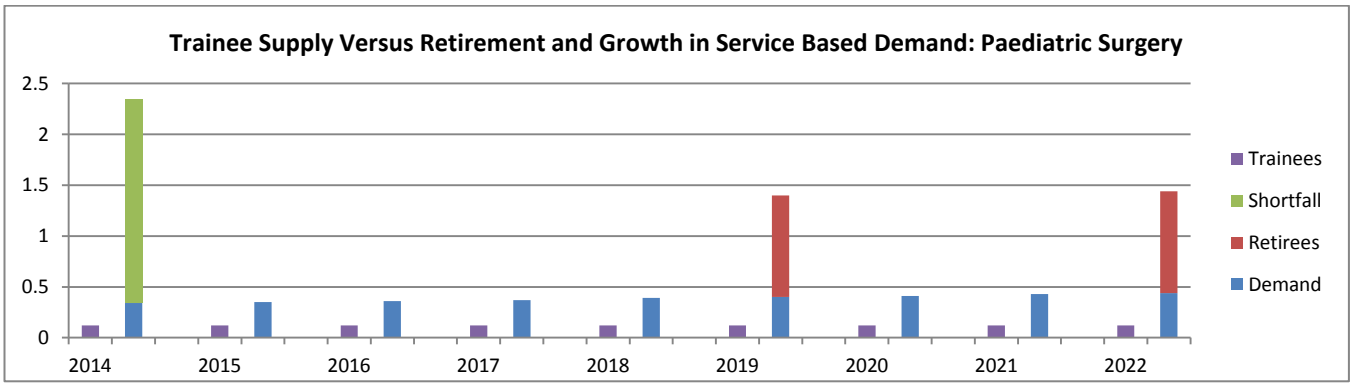
Paediatric Surgery

Current trainee throughput: **0.12** per annum

Shortfall from 2013: **2**

Growth in service based demand **0.34** increasing to **0.44** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



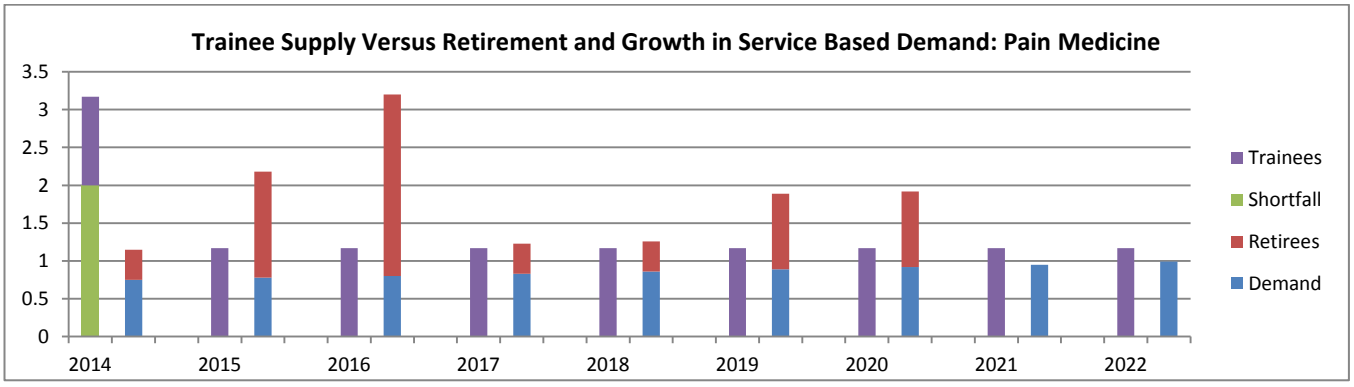
Pain Medicine

Current trainee throughput: **1.17** per annum

Excess from 2013: **2**

Growth in service based demand **0.75** increasing to **0.99** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



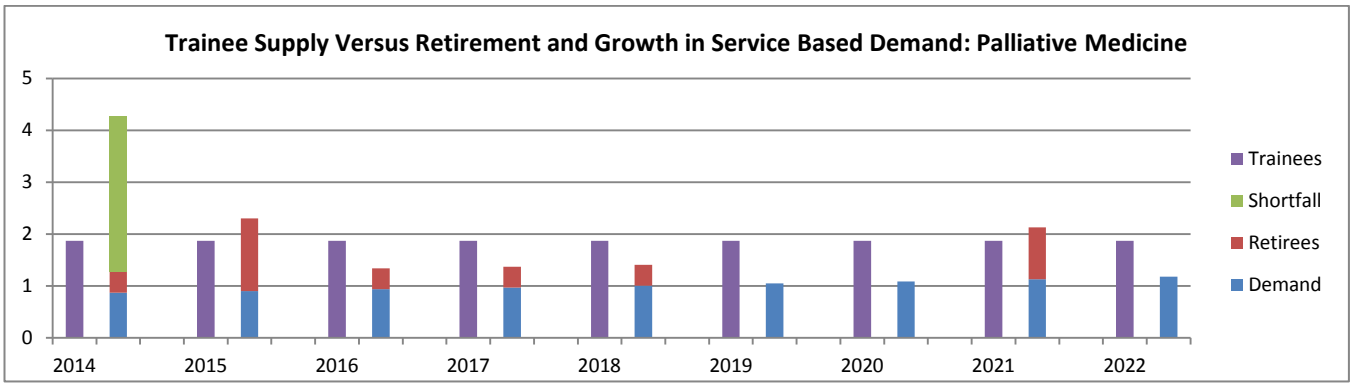
Palliative Medicine

Current trainee throughput: **1.87** per annum

Shortfall from 2013: **3**

Growth in service based demand **0.87** increasing to **1.18** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



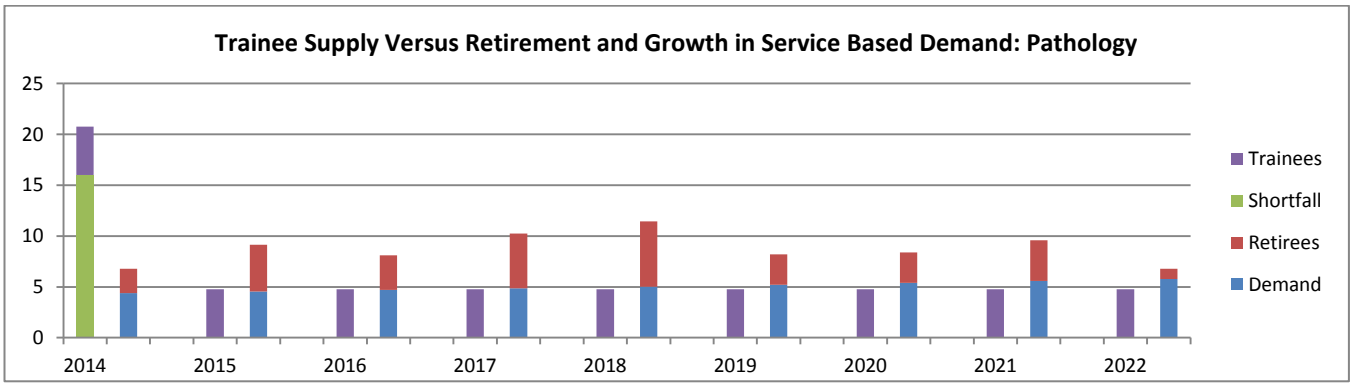
Pathology

Current trainee throughput: **4.76** per annum

Excess from 2013: **16**

Growth in service based demand **4.35** increasing to **5.78** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



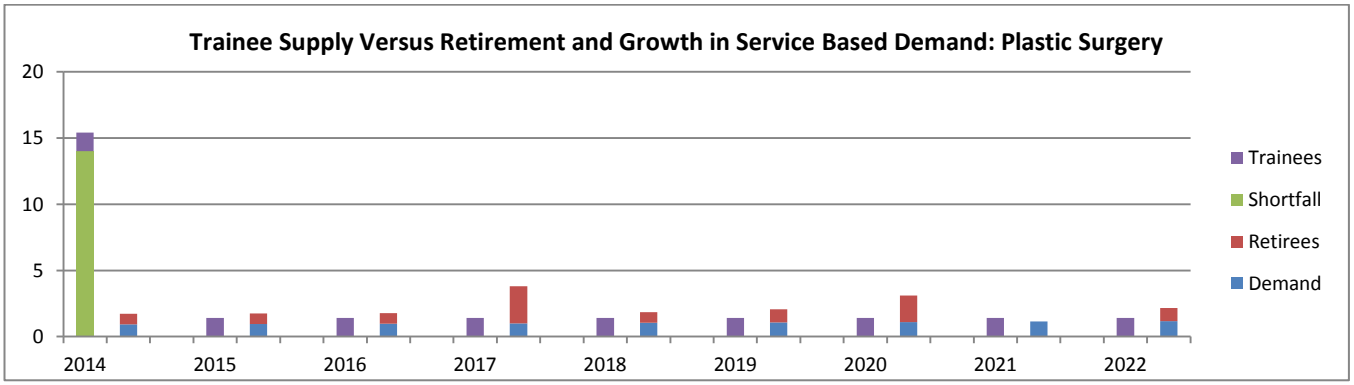
Plastic Surgery

Current trainee throughput: **1.40** per annum

Excess from 2013: **14**

Growth in service based demand **0.92** increasing to **1.17** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



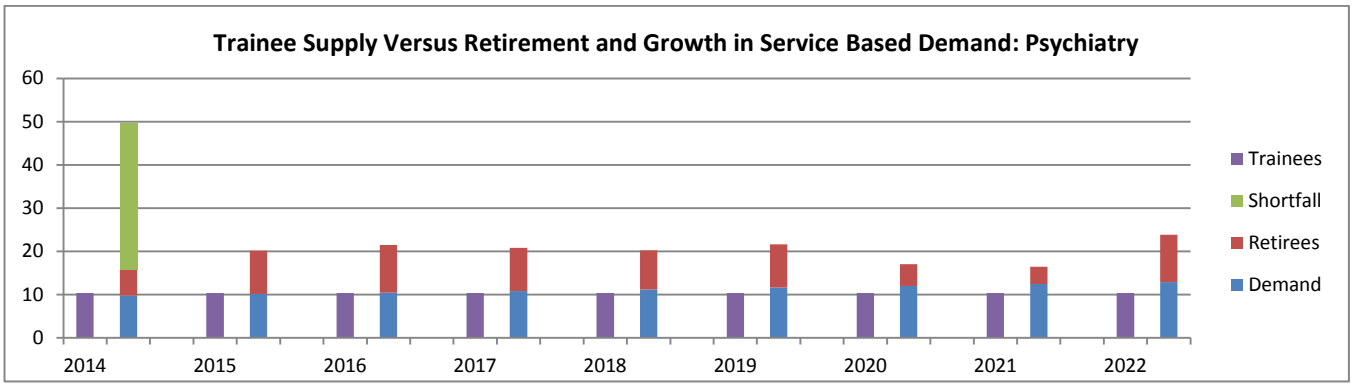
Psychiatry

Current trainee throughput: **10.4** per annum

Shortfall from 2013: **34**

Growth in service based demand **9.8** increasing to **12.9** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



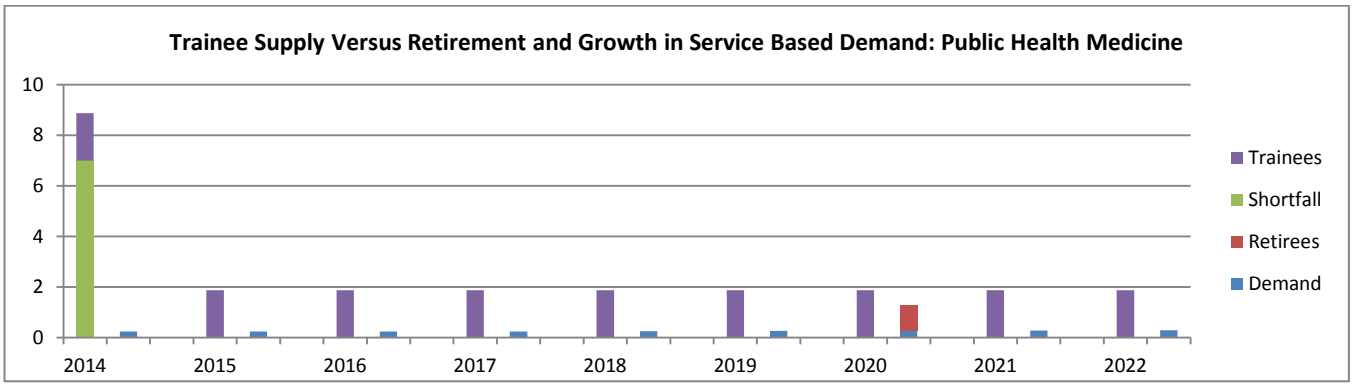
Public Health Medicine

Current trainee throughput: **1.87** per annum

Excess from 2013: **7**

Growth in service based demand **0.24** increasing to **0.29** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput.



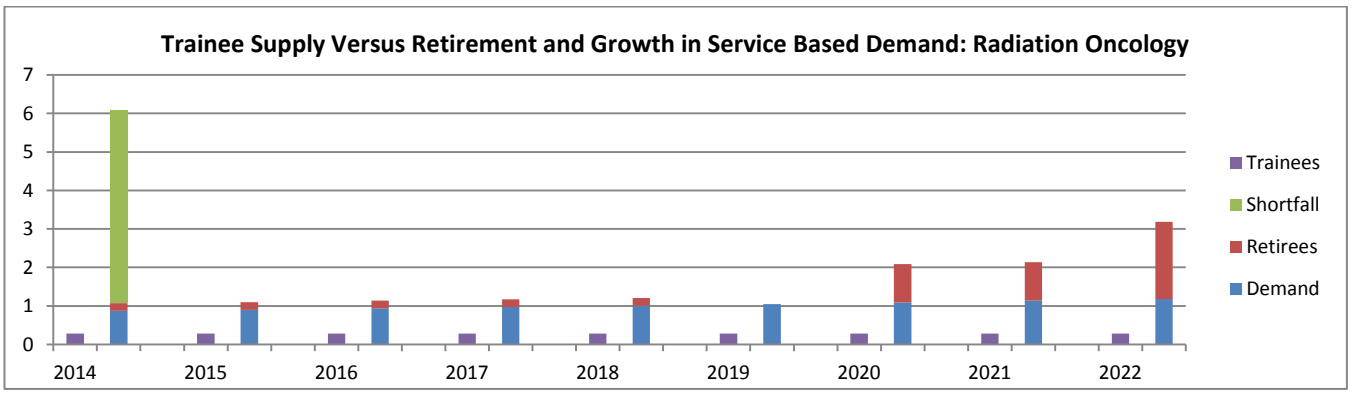
Radiation Oncology

Current trainee throughput: **0.28** per annum

Shortfall from 2013: **5**

Growth in service based demand **0.87** increasing to **1.18** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



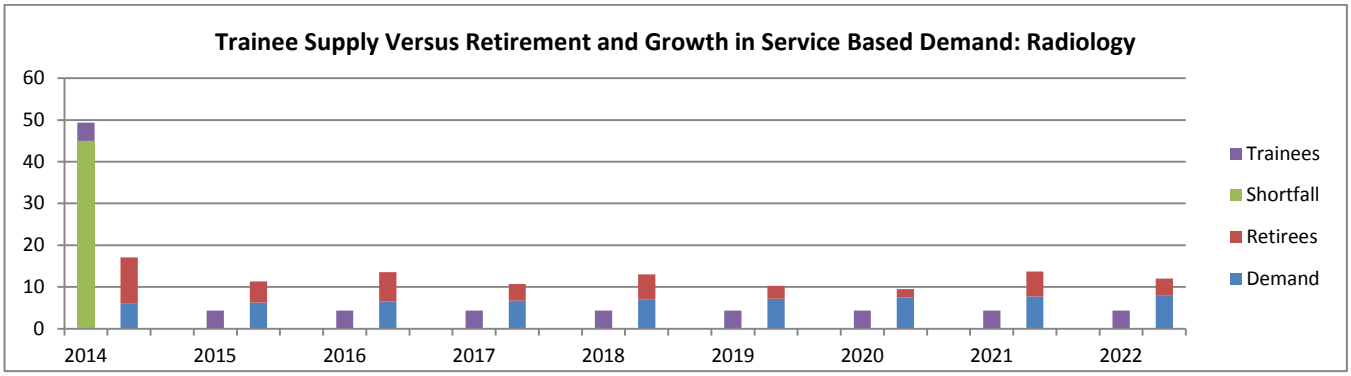
Radiology

Current trainee throughput: **4.34** per annum

Excess from 2013: **45**

Growth in service based demand **6.07** increasing to **8.00** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput. Note that Radiology includes some physicians that need to be placed in their own specialty (Nuclear Medicine) and dual qualified Radiation Oncology and Radiology. The excess in 2013 is an overstatement.



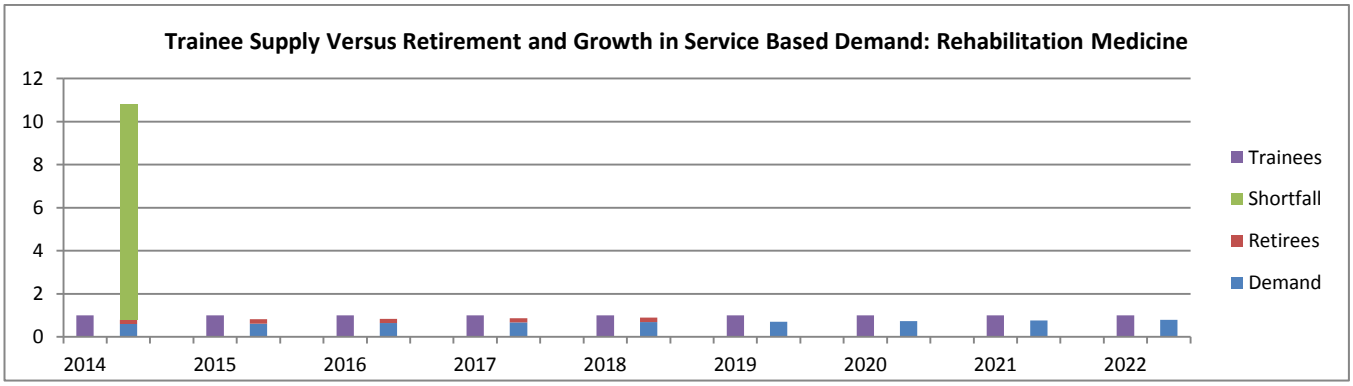
Rehabilitation Medicine

Current trainee throughput: **1.00** per annum

Shortfall from 2013: **10**

Growth in service based demand **0.60** increasing to **0.79** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput. However the main issue is the current shortfall.



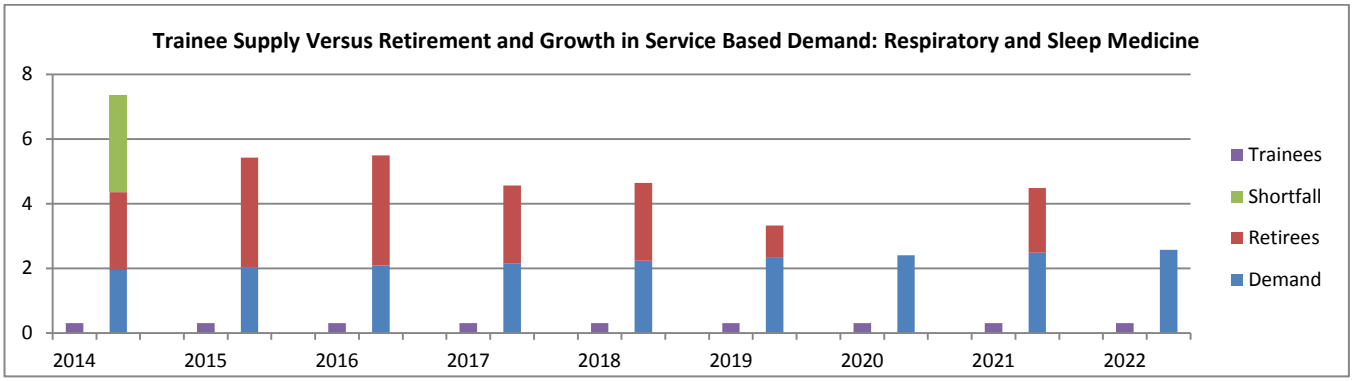
Respiratory and Sleep Medicine

Current trainee throughput**:** **0.31** per annum

Shortfall from 2013: **3**

Growth in service based demand **1.95** increasing to **2.57** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



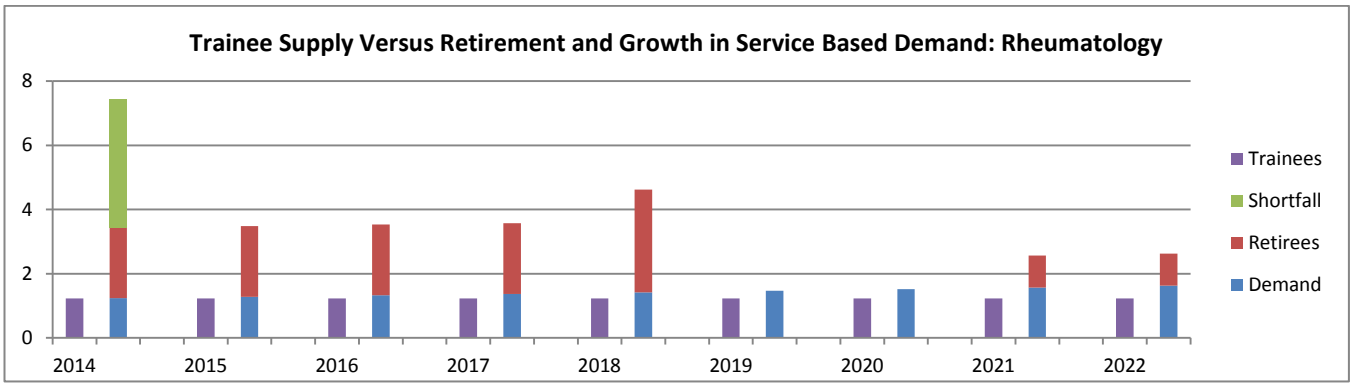
Rheumatology

Current trainee throughput: **0.31** per annum

Shortfall from 2013: **4**

Growth in service based demand **1.24** increasing to **1.63** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



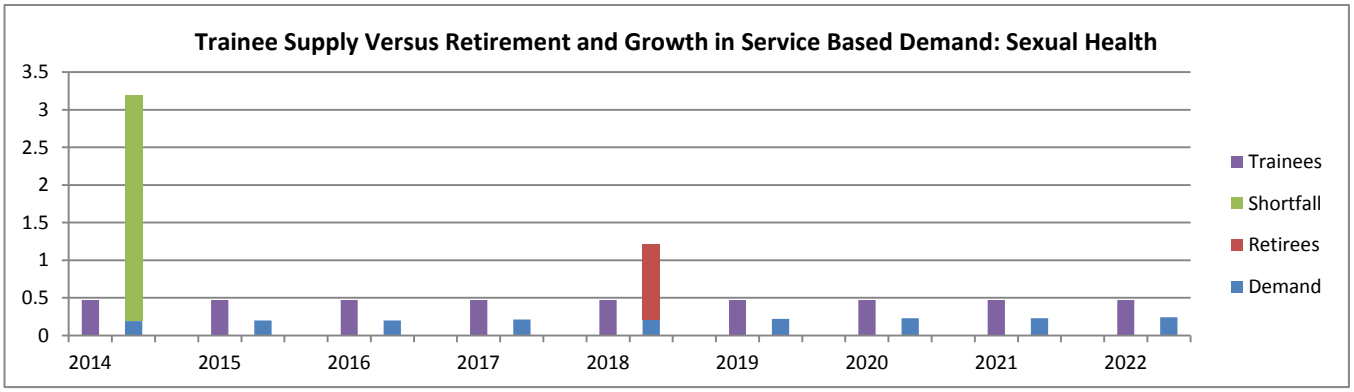
Sexual Health

Current trainee throughput: **0.47** per annum

Shortfall from 2013: **3**

Growth in service based demand **0.19** increasing to **0.24** consultants per annum

Retirement based demand and growth in service based demand addressed by trainee throughput. However the main issue is the current shortfall.



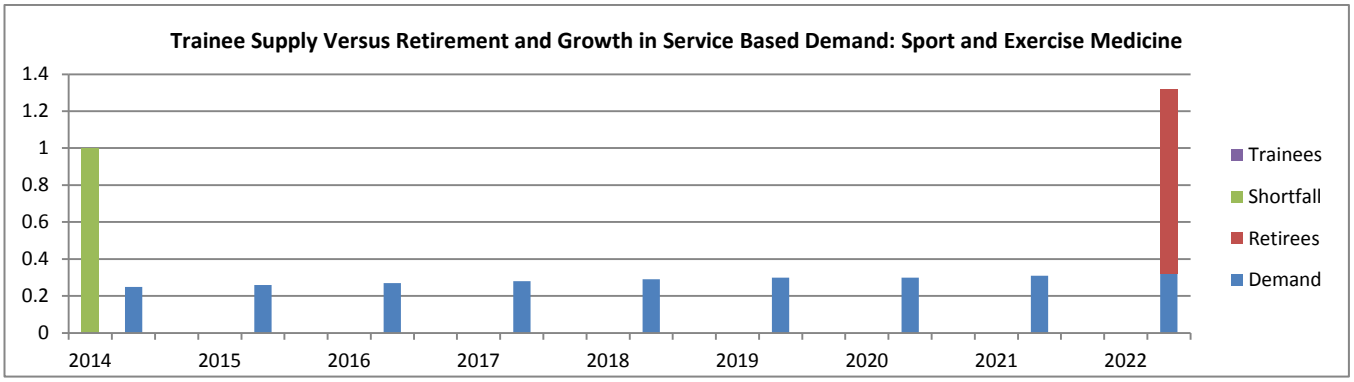
Sport and Exercise Medicine

Current trainee throughput: **nil**

Excess from 2013: **1**

Growth in service based demand **0.25** increasing to **0.32** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



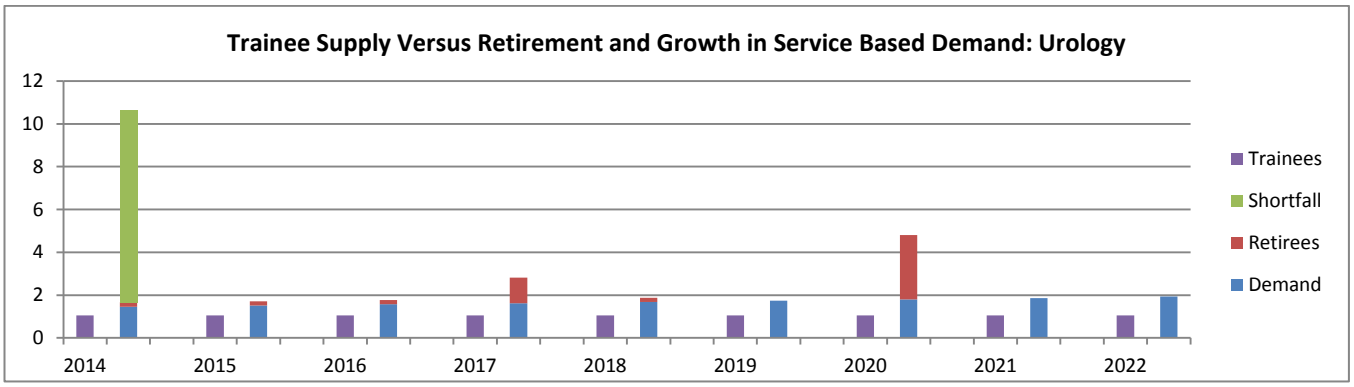
Urology

Current trainee throughput: **1.05** per annum

Shortfall from 2013: **9**

Growth in service based demand **1.46** increasing to **1.93** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



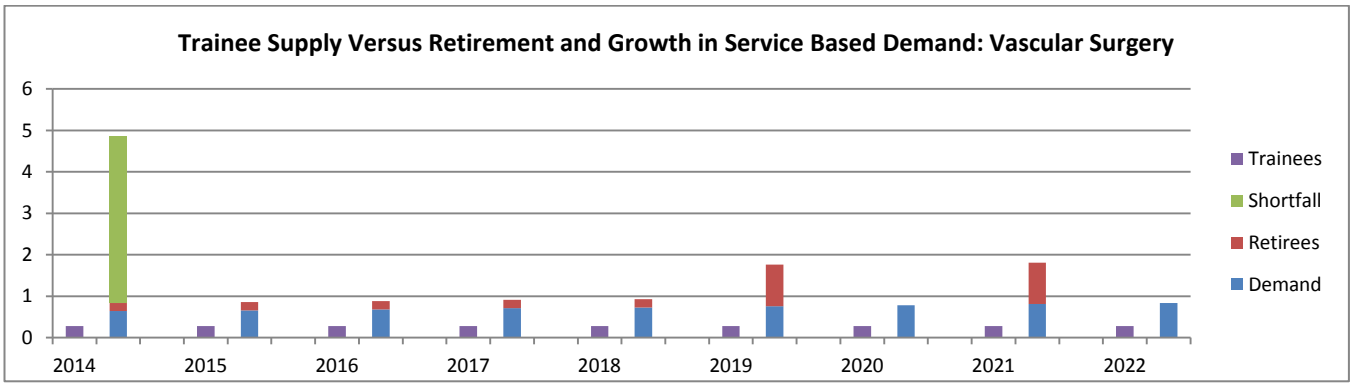
Vascular Surgery

Current trainee throughput: **0.28** per annum

Shortfall from 2013: **4**

Growth in service based demand **0.64** increasing to **0.84** consultants per annum

Retirement based demand and growth in service based demand not addressed by trainee throughput.



15. Private sector supply, demand and shortfall by medical specialty (2103, 2016 and 2021)

Medical Specialty	2013			2016			2021		
	Supply	Demand	Shortfall	Supply	Demand	Shortfall	Supply	Demand	Shortfall
Addiction Medicine	2	2	0	2	2	0	2	3	1
Anaesthesia	166	164	-2	185	179	14	179	207	28
Cardiology	39	42	3	37	47	10	43	55	12
Cardiothoracic Surg.	5	5	0	5	6	1	5	7	2
Clinical Genetics	0	0	0	0	0	0	0	0	0
Clinical Pharmacology	0	0	0	0	0	0	0	0	0
Dermatology	15	17	2	14	19	5	15	22	7
Emergency Medicine	26	26	0	29	29	0	34	34	0
Endocrinology	13	13	0	13	14	1	16	17	1
ENT Surgery	31	40	9	28	45	17	29	53	24
Gastroenterology	24	29	5	24	32	8	24	38	14
General Medicine	27	23	-4	29	25	-4	37	30	-7
General Surgery	50	56	6	51	62	11	62	74	12
Geriatric Medicine	21	18	-3	25	20	-5	33	23	-10
Haematology	17	17	0	14	19	5	14	22	8
Immunology	4	4	0	3	4	1	3	5	2
Infectious Disease	5	4	-1	6	5	-1	7	6	-1
Intensive Care	28	27	-1	32	30	=2	43	37	-6
Medical Admin.	6	4	-2	4	4	0	3	5	2
Medical Oncology	7	8	1	7	8	1	8	10	2
Neonatal Medicine	5	5	0	8	5	-3	13	6	-7
Nephrology	17	21	4	18	24	6	23	29	6
Neurology	12	12	0	12	14	2	11	16	5
Neurosurgery	10	13	3	10	15	5	11	18	7
Obstet. & Gynaecology	50	65	15	48	72	24	53	85	32
Occ. & Environ. Health	27	7	-20	24	5	-19	30	5	-25
Ophthalmology	36	45	9	33	50	17	31	59	28
Orthopaedic Surgery	53	55	2	55	61	6	56	73	17
Paediatric Medicine	28	25	-3	32	28	-4	40	333	-7
Paediatric Surgery	6	8	2	6	8	2	5	10	5
Pain Medicine	8	7	-1	7	8	1	8	9	1
Palliative Care	9	10	1	10	11	1	14	14	0
Pathology	33	29	-4	31	32	1	33	38	5
Plastic Surgery	28	19	-9	26	21	-5	28	24	-4
Psychiatry	43	48	5	41	54	13	44	64	20
Public Health	0	0	0	0	0	0	0	0	0
Radiation Oncology	11	14	3	11	16	5	9	19	10
Radiology	100	79	-21	92	87	-5	94	104	10
Rehab. Medicine	1	2	1	1	3	2	2	3	1
Resp. & Sleep Med.	18	19	1	14	21	7	13	25	12
Rheumatology	14	15	1	11	17	6	12	20	8
Sexual Health	1	2	1	1	2	1	2	3	1
Sport & Exercise Med.	9	8	-1	9	9	0	8	11	3
Urology	15	18	3	15	20	5	16	24	8
Vascular Surgery	7	8	1	7	9	2	6	11	5
Total	**1027**	**1033**	**6**	**1010**	**1142**	**132**	**1119**	**1351**	**232**

16. Private sector shortfall risk assessments by medical specialty (2013, 2016 and 2021)

Medical Specialty	2013		2016		2021	
	Percent	Risk	Percent	Risk	Percent	Risk
Addiction Medicine	100	Low	100	Low	67	Critical
Anaesthesia	101	Low	92	Low	86	Medium
Cardiology	93	Low	79	High	78	High
Cardiothoracic Surg.	100	Low	83	Medium	71	High
Clinical Genetics						
Clinical Pharmacology						
Dermatology	88	Medium	74	High	68	Critical
Emergency Medicine	100	Low	100	Low	100	Low
Endocrinology	100	Low	93	Low	94	Low
ENT Surgery	78	High	62	Critical	55	Critical
Gastroenterology	83	Medium	75	High	63	Critical
General Medicine	117	Low	116	Low	123	Low
General Surgery	89	Medium	82	Medium	84	Medium
Geriatric Medicine	117	Low	125	Low	143	Low
Haematology	100	Low	74	High	64	Critical
Immunology	100	Low	75	High	60	Critical
Infectious Disease	126	Low	120	Low	117	Low
Intensive Care	104	Low	107	Low	116	Low
Medical Admin.	150	Low	100	Low	60	Critical
Medical Oncology	88	Medium	88	Medium	80	Medium
Neonatal Medicine	100	Low	160	Low	217	Low
Nephrology	81	Medium	75	High	79	High
Neurology	100	Low	86	Medium	69	Critical
Neurosurgery	77	High	67	Critical	61	Critical
Obstet. & Gynaecology	77	High	67	Critical	62	Critical
Occ. & Environ. Health	386	Low	400	Low	600	Low
Ophthalmology	80	Medium	66	Critical	53	Critical
Orthopaedic Surgery	96	Low	90	Low	77	High
Paediatric Medicine	112	Low	114	Low	121	Low
Paediatric Surgery	75	High	75	High	50	Critical
Pain Medicine	114	Low	88	Medium	89	Medium
Palliative Care	90	Low	91	Low	100	Low
Pathology	114	Low	97	Low	87	Medium
Plastic Surgery	147	Low	124	Low	117	Low
Psychiatry	90	Low	76	High	69	Critical
Public Health						
Radiation Oncology	79	High	69	Critical	47	Critical
Radiology	127	Low	106	Low	90	Low
Rehab. Medicine	50	Critical	33	Critical	67	Critical
Resp. & Sleep Med.	95	Low	67	Critical	52	Critical
Rheumatology	93	Low	65	Critical	60	Critical
Sexual Health	50	Critical	50	Critical	67	Critical
Sport & Exercise Med.	113	Low	100	Low	73	High
Urology	83	Medium	75	High	67	Critical
Vascular Surgery	88	Medium	78	High	55	Critical

17. Expected private sector positions by medical speciality (2013, 2016 and 2021)

Medical Specialty	2013 (2013 Demand – 2013 Supply)	2016 (2016 Demand – 2013 Supply)	2021 (2021 Demand – 2013 Supply)
Addiction Medicine	0	0	1
Anaesthesia	0	13	41
Cardiology	3	8	16
Cardiothoracic Surg.	0	1	2
Clinical Genetics	0	0	0
Clinical Pharmacology	0	0	0
Dermatology	2	4	7
Emergency Medicine	0	3	8
Endocrinology	0	1	4
ENT Surgery	9	14	22
Gastroenterology	5	8	14
General Medicine	0	0	3
General Surgery	6	12	24
Geriatric Medicine	0	0	2
Haematology	0	2	5
Immunology	0	0	1
Infectious Disease	0	0	1
Intensive Care	0	2	9
Medical Admin.	0	0	0
Medical Oncology	1	1	3
Neonatal Medicine	0	0	1
Nephrology	4	7	12
Neurology	0	2	4
Neurosurgery	3	5	8
Obstet. & Gynaecology	15	22	35
Occ. & Environ. Health	0	0	0
Ophthalmology	9	14	23
Orthopaedic Surgery	2	8	20
Paediatric Medicine	0	0	5
Paediatric Surgery	2	2	4
Pain Medicine	0	0	1
Palliative Care	1	2	5
Pathology	0	0	5
Plastic Surgery	0	0	0
Psychiatry	5	11	21
Public Health	0	0	0
Radiation Oncology	3	5	8
Radiology	0	0	4
Rehab. Medicine	1	2	2
Resp. & Sleep Med.	1	3	7
Rheumatology	1	3	6
Sexual Health	1	1	2
Sport & Exercise Med.	0	0	2
Urology	3	5	9
Vascular Surgery	1	2	4
Total	**78**	**163**	**351**

18. Public sector supply, demand and shortfall by medical specialty (2013, 2016 and 2021)

Medical Specialty	2013			2016			2021		
	Supply	Demand	Shortfall	Supply	Demand	Shortfall	Supply	Demand	Shortfall
Addiction Medicine	9	9	0	9	10	1	9	13	4
Anaesthesia	253	251	-2	252	274	22	274	317	43
Cardiology	38	42	4	37	46	9	42	55	13
Cardiothoracic Surg.	6	7	1	6	8	2	7	10	3
Clinical Genetics	7	8	1	7	9	2	8	10	2
Clinical Pharmacology	1	3	2	1	3	2	0	4	4
Dermatology	16	19	3	15	21	6	16	25	9
Emergency Medicine	137	140	3	154	156	2	183	185	2
Endocrinology	29	29	0	29	33	4	38	40	2
ENT Surgery	7	9	2	6	11	5	7	13	6
Gastroenterology	36	43	7	36	48	12	36	57	21
General Medicine	70	61	-9	77	67	-10	98	79	-19
General Surgery	61	69	8	63	77	14	76	91	15
Geriatric Medicine	37	32	-5	45	36	-9	60	42	-18
Haematology	14	14	0	11	15	4	11	18	7
Immunology	20	21	1	17	23	6	18	27	9
Infectious Disease	18	14	-4	21	17	-4	25	21	-4
Intensive Care	24	23	-1	27	25	-2	36	31	-5
Medical Admin.	20	13	-7	13	13	0	11	15	4
Medical Oncology	29	34	5	31	38	7	36	47	11
Neonatal Medicine	16	14	-2	25	16	-9	41	19	-22
Nephrology	16	1	5	18	23	5	22	29	7
Neurology	27	29	2	27	32	5	26	38	12
Neurosurgery	6	7	1	6	9	3	6	10	4
Obstet. & Gynaecology	71	92	21	68	102	34	75	120	45
Occ. & Environ. Health	6	1	-5	5	1	-4	6	1	-5
Ophthalmology	30	37	7	27	41	14	25	49	24
Orthopaedic Surgery	43	45	2	45	50	5	46	60	14
Paediatric Medicine	84	75	-9	94	82	-12	120	98	-22
Paediatric Surgery	3	2	0	2	2	0	1	3	2
Pain Medicine	15	14	-1	14	16	2	16	18	2
Palliative Care	10	11	1	11	12	1	15	15	0
Pathology	108	96	-12	104	106	2	111	126	15
Plastic Surgery	17	12	-5	16	13	-3	17	15	-2
Psychiatry	203	231	28	195	256	61	208	304	96
Public Health	16	9	-7	22	10	-12	30	12	-18
Radiation Oncology	6	7	1	6	8	2	4	10	6
Radiology	119	94	-25	110	104	-6	112	124	12
Rehab. Medicine	6	14	8	7	16	9	12	19	7
Resp. & Sleep Med.	35	36	1	27	40	13	25	48	23
Rheumatology	17	19	2	14	22	8	15	26	11
Sexual Health	2	4	2	2	4	2	4	5	1
Sport & Exercise Med.	0	0	0	0	0	0	0	0	0
Urology	18	23	5	19	25	6	20	30	10
Vascular Surgery	7	9	2	7	10	3	6	12	6
Total	**1712**	**1743**	**31**	**1728**	**1930**	**202**	**1954**	**2291**	**337**

19. Public sector shortfall risk assessments by medical speciality (2013, 2016 and 2021)

Medical Specialty	2013		2016		2021	
	Percent	Risk	Percent	Risk	Percent	Risk
Addiction Medicine	100	Low	90	Low	69	Critical
Anaesthesia	101	Low	92	Low	86	Medium
Cardiology	90	Low	80	Medium	76	High
Cardiothoracic Surg.	86	Medium	75	High	70	High
Clinical Genetics	88	Medium	78	High	80	Medium
Clinical Pharmacology	33	Critical	33	Critical	0	Critical
Dermatology	84	Medium	71	High	64	Critical
Emergency Medicine	98	Low	99	Low	99	Low
Endocrinology	100	Low	88	Medium	95	Low
ENT Surgery	78	High	55	Critical	54	Critical
Gastroenterology	84	Medium	75	High	63	Critical
General Medicine	115	Low	115	Low	124	Low
General Surgery	88	Medium	82	Medium	84	Medium
Geriatric Medicine	116	Low	125	Low	143	Low
Haematology	100	Low	73	High	61	Critical
Immunology	95	Low	74	High	67	Critical
Infectious Disease	129	Low	124	Low	119	Low
Intensive Care	104	Low	108	Low	116	Low
Medical Admin.	154	Low	100	Low	73	High
Medical Oncology	85	Medium	82	Medium	77	High
Neonatal Medicine	114	Low	156	Low	216	Low
Nephrology	76	High	78	High	76	High
Neurology	93	Low	84	Medium	68	Critical
Neurosurgery	86	Medium	67	Critical	60	Critical
Obstet. & Gynaecology	77	High	67	Critical	63	Critical
Occ. & Environ. Health	600	Low	500	Low	600	Low
Ophthalmology	81	Medium	66	Critical	51	Critical
Orthopaedic Surgery	96	Low	90	Low	77	High
Paediatric Medicine	112	Low	115	Low	122	Low
Paediatric Surgery	100	Low	100	Low	33	Critical
Pain Medicine	107	Low	88	Medium	89	Medium
Palliative Care	91	Low	92	Low	100	Low
Pathology	113	Low	98	Low	88	Medium
Plastic Surgery	142	Low	123	Low	113	Low
Psychiatry	88	Medium	76	High	68	Critical
Public Health	178	Low	220	Low	250	Low
Radiation Oncology	86	Medium	75	High	40	Critical
Radiology	127	Low	106	Low	90	Low
Rehab. Medicine	43	Critical	44	Critical	63	Critical
Resp. & Sleep Med.	97	Low	68	Critical	52	Critical
Rheumatology	89	Medium	64	Critical	58	Critical
Sexual Health	50	Critical	50	Critical	80	Medium
Sport & Exercise Med.	-		-		-	
Urology	78	High	76	High	67	Critical
Vascular Surgery	78	High	70	High	50	Critical

20. Public sector funded positions required by medical speciality (2013, 2016 and 2021)

Medical Specialty	2013 (2013 Demand – 2013 Supply)	2016 (2016 Demand – 2013 Supply)	2021 (2021 Demand – 2013 Supply)
Addiction Medicine	0	1	4
Anaesthesia	0	21	64
Cardiology	4	8	17
Cardiothoracic Surg.	1	2	4
Clinical Genetics	1	2	3
Clinical Pharmacology	2	2	3
Dermatology	3	5	9
Emergency Medicine	3	19	48
Endocrinology	0	4	11
ENT Surgery	2	4	6
Gastroenterology	7	12	21
General Medicine	0	0	9
General Surgery	8	16	30
Geriatric Medicine	0	0	5
Haematology	0	1	4
Immunology	1	3	7
Infectious Disease	0	0	3
Intensive Care	0	1	7
Medical Admin.	0	0	0
Medical Oncology	5	9	18
Neonatal Medicine	0	0	3
Nephrology	5	7	13
Neurology	2	5	11
Neurosurgery	1	3	4
Obstet. & Gynaecology	21	31	49
Occ. & Environ. Health	0	0	0
Ophthalmology	7	11	19
Orthopaedic Surgery	2	7	17
Paediatric Medicine	0	0	14
Paediatric Surgery	0	0	1
Pain Medicine	0	1	3
Palliative Care	1	2	5
Pathology	0	0	18
Plastic Surgery	0	0	0
Psychiatry	28	53	101
Public Health	0	0	0
Radiation Oncology	1	2	4
Radiology	0	0	5
Rehab. Medicine	8	10	13
Resp. & Sleep Med.	1	5	13
Rheumatology	2	5	9
Sexual Health	2	2	3
Sport & Exercise Med.	0	0	0
Urology	5	7	12
Vascular Surgery	2	3	5
Total	**125**	**264**	**595**

21. Optimal Consultant Allocation Model simulation analysis

Appendix 20 is the commencement of the simulation. It shows the shortfalls confronting the public sector identified in SWCP 2013 that will be reduced by the implementation of OCAM**.** *It should be noted that this simulation does not make use of retirements, which are an important component of the OCAM strategy in practice.*

Table A: Provides the number of positions by specialty funded during the simulation (after the fact).

Phase 1 (2015 and 2016):

With 170 funded positions in 2015 and 2016, it should be possible to:

- Address all 2016 critical and high risk specialties by reducing their risk to low or medium.
- Ensure that all surgical specialties have supply = demand (a crucial element in an ABF/M environment).
- Ensure, where possible, that all non-surgical specialties have supply near or above 0.9 x demand (supply near 90% demand).
- Remove any excess in specialties by natural attrition.
- Ensure that no placement occurs in advance of demand.
- Completion of this task should also have a significant impact on the 2021 risk assessments.

Results for phase 1 can be found in Tables B, C and D:

- Table B: The revised supply and demand projections for 2016 and 2021, assuming that the 2015 and 2016 allocations from Table A were undertaken using the OCAM priority list.
- Table C: The reduction in specialty risk assessments for 2016 and 2021, assuming the 2015 and 2016 allocations from Table A were undertaken.
- Table D: The number of positions in each specialty that still need to be funded at the completion of 2015 and 2016 i.e. the positions initially required in Appendix 20, reduced for the 170 positions allocated during phase 1.

Phase 2 (2017):

With a further 85 funded positions in 2017, it should be possible to have a near optimal mix of consultants that will have a projected low- or medium-risk assessment shortfall four years prior to the target date of 2021.

Results for phase 2 can be found in Tables E, F and G:

- Table E: The revised supply and demand projections for 2016 and 2021, assuming that the 2015, 2016 and 2017 allocations from Table A were undertaken using the OCAM priority list.
- Table F: The reduction in specialty risk assessments for 2016 and 2021, assuming the 2015, 2016 and 2017 allocations from Table A were undertaken.
- Table G: The number of positions in each specialty that still need to be funded at the completion of 2015, 2016 and 2017 i.e. The positions initially required in Appendix 20, reduced for the 255 positions allocated during phases 1 and 2.

Table A: Positions funded (applying OCAM priorities)

Medical Specialty	2015	2016	2017
Addiction Medicine	1	0	1
Anaesthesia			3
Cardiology	2	2	4
Cardiothoracic Surg.	1	1	1
Clinical Genetics	1	0	1
Clinical Pharmacology	1	1	1
Dermatology	1	1	3
Emergency Medicine	8	9	8
Endocrinology			4
ENT Surgery	2	2	1
Gastroenterology	3	3	6
General Medicine			
General Surgery	8	8	4
Geriatric Medicine			
Haematology	0	1	
Immunology	1	1	
Infectious Disease			
Intensive Care		1	
Medical Admin.			
Medical Oncology	2	2	6
Neonatal Medicine			
Nephrology	1	2	4
Neurology	1	1	3
Neurosurgery	1	2	
Obstet. & Gynaecology	14	9	6
Occ. & Environ. Health			
Ophthalmology	3	4	3
Orthopaedic Surgery	3	4	2
Paediatric Medicine			3
Paediatric Surgery			
Pain Medicine			
Palliative Care	0	1	1
Pathology			
Plastic Surgery			
Psychiatry	18	11	15
Public Health			
Radiation Oncology	1	1	
Radiology			
Rehab. Medicine	4	4	2
Resp. & Sleep Med.	1	4	2
Rheumatology	2	3	
Sexual Health	1	1	
Sport & Exercise Med.			
Urology	3	4	1
Vascular Surgery	1	2	
Total	**85**	**85**	**85**

Table B: Public sector supply, demand and shortfall at the completion of phase one (2015-16)

Medical Specialty	2013			2016			2021		
	Supply	Demand	Shortfall	Supply	Demand	Shortfall	Supply	Demand	Shortfall
Addiction Medicine	9	9	0	10	10	0	10	13	3
Anaesthesia	253	251	-2	253	274	21	253	317	64
Cardiology	38	42	4	42	46	4	42	55	13
Cardiothoracic Surg.	6	7	1	8	8	0	8	10	2
Clinical Genetics	7	8	1	8	9	1	8	10	2
Clinical Pharmacology	1	3	2	3	3	0	3	4	1
Dermatology	16	19	3	18	21	3	18	25	7
Emergency Medicine	137	140	3	154	156	2	154	185	31
Endocrinology	29	29	0	29	33	4	29	40	11
ENT Surgery	7	9	2	11	11	0	11	13	2
Gastroenterology	36	43	7	42	48	6	42	57	15
General Medicine	70	61	-9	70	67	-3	70	79	9
General Surgery	61	69	8	77	77	0	77	91	14
Geriatric Medicine	37	32	-5	37	36	-1	37	42	5
Haematology	14	14	0	15	15	0	15	18	3
Immunology	20	21	1	22	23	1	22	27	5
Infectious Disease	18	14	-4	18	17	-1	18	21	3
Intensive Care	24	23	-1	25	25	0	25	31	6
Medical Admin.	20	13	-7	13	13	0	13	15	2
Medical Oncology	29	34	5	33	38	5	33	47	14
Neonatal Medicine	16	14	-2	16	16	0	16	19	3
Nephrology	16	21	5	19	23	4	19	29	10
Neurology	27	29	2	29	32	3	29	38	9
Neurosurgery	6	7	1	9	9	0	9	10	1
Obstet. & Gynaecology	71	92	21	94	102	8	94	120	26
Occ. & Environ. Health	6	1	-5	6	1	-5	6	1	-5
Ophthalmology	30	37	7	37	41	4	37	49	12
Orthopaedic Surgery	43	45	2	50	50	0	50	60	10
Paediatric Medicine	84	75	-9	84	82	-2	84	98	14
Paediatric Surgery	3	2	-1	3	2	-1	3	3	0
Pain Medicine	15	14	-1	15	16	1	15	18	3
Palliative Care	10	11	1	11	12	1	11	15	4
Pathology	108	96	-12	108	106	-2	108	126	18
Plastic Surgery	17	12	-5	17	13	-4	17	15	-2
Psychiatry	203	231	28	232	256	24	232	304	72
Public Health	16	9	-7	16	10	-6	16	12	-4
Radiation Oncology	6	7	1	8	8	0	8	10	2
Radiology	119	94	-25	119	104	-15	119	124	5
Rehab. Medicine	6	14	8	14	16	2	14	19	5
Resp. & Sleep Med.	35	36	1	40	40	0	40	48	8
Rheumatology	17	19	2	22	22	0	22	26	4
Sexual Health	2	4	2	4	4	0	4	5	1
Sport & Exercise Med.	0	0	0	0	0	0	0	0	0
Urology	18	23	5	25	25	0	25	30	5
Vascular Surgery	7	9	2	10	10	0	10	12	2
Total	**1712**	**1743**	**31**	**1876**	**1930**	**54**	**1876**	**2291**	**415**

- At end 2016, the net shortfall has increased from 31 in 2013 (125 shortfall and 94 excess) to 54 in 2016; however, this is actually an improvement as the levels of shortfall and excess among the subsets of specialties have both decreased since 2013.

Table C: Public sector shortfall risk assessments by medical specialty at the completion of phase one (2015-16)

Medical Specialty	2013		2016		2021	
	Percent	Risk	Percent	Risk	Percent	Risk
Addiction Medicine	100	Low	100	Low	77	High
Anaesthesia	101	Low	92	Low	80	Medium
Cardiology	90	Low	91	Low	76	High
Cardiothoracic Surg.	86	Medium	100	Low	80	Medium
Clinical Genetics	88	Medium	89	Medium	80	Medium
Clinical Pharmacology	33	Critical	100	Low	75	High
Dermatology	84	Medium	86	Medium	72	High
Emergency Medicine	98	Low	99	Low	83	Medium
Endocrinology	100	Low	88	Medium	73	High
ENT Surgery	78	High	100	Low	85	Medium
Gastroenterology	84	Medium	88	Medium	74	High
General Medicine	115	Low	104	Low	89	Medium
General Surgery	88	Medium	100	Low	85	Medium
Geriatric Medicine	116	Low	103	Low	88	Medium
Haematology	100	Low	100	Low	83	Medium
Immunology	95	Low	96	Low	81	Medium
Infectious Disease	129	Low	106	Low	86	Medium
Intensive Care	104	Low	100	Low	81	Medium
Medical Admin.	154	Low	100	Low	87	Medium
Medical Oncology	85	Medium	87	Medium	70	High
Neonatal Medicine	114	Low	100	Low	84	Medium
Nephrology	76	High	83	Medium	66	Critical
Neurology	93	Low	91	Low	76	High
Neurosurgery	86	Medium	100	Low	90	Low
Obstet. & Gynaecology	77	High	92	Low	78	High
Occ. & Environ. Health	600	Low	600	Low	600	Low
Ophthalmology	81	Medium	90	Low	76	High
Orthopaedic Surgery	96	Low	100	Low	83	Medium
Paediatric Medicine	112	Low	102	Low	86	Medium
Paediatric Surgery	100	Low	150	Low	100	Low
Pain Medicine	107	Low	94	Low	83	Medium
Palliative Care	91	Low	92	Low	73	High
Pathology	113	Low	102	Low	86	Medium
Plastic Surgery	142	Low	131	Low	113	Low
Psychiatry	88	Medium	91	Low	76	High
Public Health	178	Low	160	Low	133	Low
Radiation Oncology	86	Medium	100	Low	80	Medium
Radiology	127	Low	114	Low	96	Low
Rehab. Medicine	43	Critical	88	Medium	74	High
Resp. & Sleep Med.	97	Low	100	Low	83	Medium
Rheumatology	89	Medium	100	Low	85	Medium
Sexual Health	50	Critical	100	Low	80	Medium
Sport & Exercise Med.	-		-		-	
Urology	78	High	100	Low	83	Medium
Vascular Surgery	78	High	100	Low	83	Medium

At the end of 2016:

- Supply = demand for all surgical specialties.
- Supply is near or greater than 90% of demand for non-surgical specialties except perhaps nephrology (which could be adjusted by increasing nephrology by one or two at the expense of decreasing another specialty by one or two)

- The three critical and five high risk specialties from 2013 have been addressed.
- All specialties are either at medium (seven specialties) or at low assessed risk. This is a clear decrease in risk assessment from 9 critical and 11 high risk specialties from 2013.
- There is only one critical risk specialty and 13 high risk specialties projected for 2021. This is a significant improvement from 19 critical and 6 high risk assessments identified in 2013. With five years remaining, one critical and 13 high risk specialties should be simple to address in the following year (2017).
- All specialties are at a manageable level for the next five years. The 2017 position funding target should simply be a matter of ensuring supply = demand for surgical specialties, addressing the one critical and 13 high risk specialties as soon as possible (by not creating any excess) and increasing consultant numbers to supply > 90% demand. The allocated 85 funded positions for 2017 is probably sufficient to achieve most of the second and third targets. The first target of supply = demand for surgical specialties cannot be achieved for 2021 by 2017, as an unnecessary excess would be created.

Table D: Public sector funded positions still required at the completion of phase one (2015-16)

Medical Specialty	2013 (2013 Demand – 2013 Supply)	2016 (2016 Demand – 2013 Supply)	2021 (2021 Demand – 2013 Supply)
Addiction Medicine	0	0	3
Anaesthesia	0	21	64
Cardiology	0	4	13
Cardiothoracic Surg.	0	0	2
Clinical Genetics	0	1	2
Clinical Pharmacology	0	0	1
Dermatology	1	3	7
Emergency Medicine	0	2	31
Endocrinology	0	4	11
ENT Surgery	0	0	2
Gastroenterology	1	6	15
General Medicine	0	0	9
General Surgery	0	8	14
Geriatric Medicine	0	0	5
Haematology	0	0	3
Immunology	0	1	5
Infectious Disease	0	0	3
Intensive Care	0	0	6
Medical Admin.	0	0	0
Medical Oncology	1	5	14
Neonatal Medicine	0	0	3
Nephrology	2	4	10
Neurology	0	3	9
Neurosurgery	0	0	1
Obstet. & Gynaecology	0	8	26
Occ. & Environ. Health	0	0	0
Ophthalmology	0	4	12
Orthopaedic Surgery	0	0	10
Paediatric Medicine	0	0	14
Paediatric Surgery	0	0	1
Pain Medicine	0	1	3
Palliative Care	0	1	4
Pathology	0	0	18
Plastic Surgery	0	0	0
Psychiatry	0	24	72
Public Health	0	0	0
Radiation Oncology	0	0	2
Radiology	0	0	5
Rehab. Medicine	0	2	5
Resp. & Sleep Med.	0	0	8
Rheumatology	0	0	4
Sexual Health	0	0	1
Sport & Exercise Med.	0	0	0
Urology	0	0	5
Vascular Surgery	0	0	2
Total	**5**	**102**	**425**

Table E: Public sector supply, demand and shortfall at the completion of phase two (2017)

Medical Specialty	2013			2016			2021		
	Supply	Demand	Shortfall	Supply	Demand	Shortfall	Supply	Demand	Shortfall
Addiction Medicine	9	9	0	10	10	0	11	13	2
Anaesthesia	253	251	-2	253	274	21	255	317	62
Cardiology	38	42	4	42	46	4	46	55	9
Cardiothoracic Surg.	6	7	1	8	8	0	9	10	1
Clinical Genetics	7	8	1	8	9	1	9	10	1
Clinical Pharmacology	1	3	2	3	3	0	4	4	0
Dermatology	16	19	3	18	21	3	21	25	4
Emergency Medicine	137	140	3	154	156	2	162	185	23
Endocrinology	29	29	0	29	33	4	33	40	7
ENT Surgery	7	9	2	11	11	0	12	13	1
Gastroenterology	36	43	7	42	48	6	48	57	9
General Medicine	70	61	-9	70	67	-3	70	79	9
General Surgery	61	69	8	77	77	0	81	91	10
Geriatric Medicine	37	32	-5	37	36	-1	37	42	5
Haematology	14	14	0	15	15	0	15	18	3
Immunology	20	21	1	22	23	1	22	27	5
Infectious Disease	18	14	-4	18	17	-1	18	21	3
Intensive Care	24	23	-1	25	25	0	25	31	6
Medical Admin.	20	13	-7	13	13	0	13	15	2
Medical Oncology	29	34	5	33	38	5	39	47	8
Neonatal Medicine	16	14	-2	16	16	0	16	19	3
Nephrology	16	21	5	19	23	4	24	29	5
Neurology	27	29	2	29	32	3	32	38	6
Neurosurgery	6	7	1	9	9	0	9	10	1
Obstet. & Gyn	71	92	21	94	102	8	100	120	20
Occ. & Environ. Health	6	1	-5	6	1	-5	6	1	-5
Ophthalmology	30	37	7	37	41	4	40	49	9
Orthopaedic Surgery	43	45	2	50	50	0	52	60	8
Paediatric Medicine	84	75	-9	84	82	-2	87	98	11
Paediatric Surgery	3	2	-1	3	2	-1	3	3	0
Pain Medicine	15	14	-1	15	16	1	15	18	3
Palliative Care	10	11	1	11	12	1	12	15	3
Pathology	108	96	-12	108	106	-2	108	126	18
Plastic Surgery	17	12	-5	17	13	-4	17	15	-2
Psychiatry	203	231	28	232	256	24	247	304	57
Public Health	16	9	-7	16	10	-6	16	12	-4
Radiation Oncology	6	7	1	8	8	0	8	10	2
Radiology	119	94	-25	119	104	-15	119	124	5
Rehab. Medicine	6	14	8	14	16	2	16	19	3
Resp. & Sleep Med.	35	36	1	40	40	0	42	48	6
Rheumatology	17	19	2	22	22	0	22	26	4
Sexual Health	2	4	2	4	4	0	4	5	1
Sport & Exercise Med.	0	0	0	0	0	0	0	0	0
Urology	18	23	5	25	25	0	26	30	4
Vascular Surgery	7	9	2	10	10	0	10	12	2
Total	**1712**	**1743**	**31**	**1876**	**1930**	**54**	**1961**	**2291**	**330**

Table F: Public sector shortfall risk assessments by medical specialty at the completion of phase two (2017)

Medical Specialty	2013		2016		2021	
	Percent	Risk	Percent	Risk	Percent	Risk
Addiction Medicine	100	Low	100	Low	85	Medium
Anaesthesia	101	Low	92	Low	80	Medium
Cardiology	90	Low	91	Low	84	Medium
Cardiothoracic Surg.	86	Medium	100	Low	90	Low
Clinical Genetics	88	Medium	89	Medium	90	Low
Clinical Pharmacology	33	Critical	100	Low	100	Low
Dermatology	84	Medium	86	Medium	84	Medium
Emergency Medicine	98	Low	99	Low	88	Medium
Endocrinology	100	Low	88	Medium	83	Medium
ENT Surgery	78	High	100	Low	92	Low
Gastroenterology	84	Medium	88	Medium	84	Medium
General Medicine	115	Low	104	Low	89	Medium
General Surgery	88	Medium	100	Low	89	Medium
Geriatric Medicine	116	Low	103	Low	88	Medium
Haematology	100	Low	100	Low	83	Medium
Immunology	95	Low	96	Low	81	Medium
Infectious Disease	129	Low	106	Low	86	Medium
Intensive Care	104	Low	100	Low	81	Medium
Medical Admin.	154	Low	100	Low	87	Medium
Medical Oncology	85	Medium	87	Medium	83	Medium
Neonatal Medicine	114	Low	100	Low	84	Medium
Nephrology	76	High	83	Medium	83	Medium
Neurology	93	Low	91	Low	84	Medium
Neurosurgery	86	Medium	100	Low	90	Low
Obstet. & Gynaecology	77	High	92	Low	83	Medium
Occ. & Environ. Health	600	Low	600	Low	600	Low
Ophthalmology	81	Medium	90	Low	82	Medium
Orthopaedic Surgery	96	Low	100	Low	87	Medium
Paediatric Medicine	112	Low	102	Low	89	Medium
Paediatric Surgery	100	Low	150	Low	100	Low
Pain Medicine	107	Low	94	Low	83	Medium
Palliative Care	91	Low	92	Low	80	Medium
Pathology	113	Low	102	Low	86	Medium
Plastic Surgery	142	Low	131	Low	113	Low
Psychiatry	88	Medium	91	Low	81	Medium
Public Health	178	Low	160	Low	133	Low
Radiation Oncology	86	Medium	100	Low	80	Medium
Radiology	127	Low	114	Low	96	Low
Rehab. Medicine	43	Critical	88	Medium	84	Medium
Resp. & Sleep Med.	97	Low	100	Low	88	Medium
Rheumatology	89	Medium	100	Low	85	Medium
Sexual Health	50	Critical	100	Low	80	Medium
Sport & Exercise Med.	-		-		-	
Urology	78	High	100	Low	87	Medium
Vascular Surgery	78	High	100	Low	83	Medium

- By end 2017 there are no specialties with a critical and high risk assessment for 2021 and there is still four years remaining to address any medium risk specialties in the public sector.

- Pro-rata funding for 2015 and 2016 of 85 consultants per annum is sufficient to ensure every specialty has at most a medium risk shortfall (or low risk shortfall) by end 2016. Pro rata funding for 2017 is sufficient to ensure every specialty has a medium risk shortfall (or low risk shortfall) for 2021 by end 2017.
- Three years is also sufficient to get the consultant mix correct. Most of the excess has been removed by end 2016 with some minor excess remaining to 2021. All the excess could be removed by natural attrition (retirements).

Table G: Public sector funded positions still required at the completion of phase two (2017)

Medical Specialty	2013 (2013 Demand – 2013 Supply)	2016 (2016 Demand – 2013 Supply)	2021 (2021 Demand – 2013 Supply)
Addiction Medicine	0	0	2
Anaesthesia	0	19	62
Cardiology	0	0	9
Cardiothoracic Surg.	0	0	1
Clinical Genetics	0	0	1
Clinical Pharmacology	0	0	0
Dermatology	0	0	4
Emergency Medicine	0	0	25
Endocrinology	0	0	7
ENT Surgery	0	0	1
Gastroenterology	0	0	9
General Medicine	0	0	9
General Surgery	0	4	10
Geriatric Medicine	0	0	5
Haematology	0	0	3
Immunology	0	1	5
Infectious Disease	0	0	3
Intensive Care	0	0	6
Medical Admin.	0	0	0
Medical Oncology	0	0	13
Neonatal Medicine	0	0	3
Nephrology	0	0	5
Neurology	0	0	6
Neurosurgery	0	0	1
Obstet. & Gynaecology	0	2	20
Occ. & Environ. Health	0	0	0
Ophthalmology	0	1	9
Orthopaedic Surgery	0	0	8
Paediatric Medicine	0	0	11
Paediatric Surgery	0	0	1
Pain Medicine	0	1	3
Palliative Care	0	0	3
Pathology	0	0	18
Plastic Surgery	0	0	0
Psychiatry	0	9	57
Public Health	0	0	0
Radiation Oncology	0	0	2
Radiology	0	0	5
Rehab. Medicine	0	0	3
Resp. & Sleep Med.	0	0	6
Rheumatology	0	0	4
Sexual Health	0	0	1
Sport & Exercise Med.	0	0	0
Urology	0	0	1
Vascular Surgery	0	0	2
Total	**0**	**37**	**344**

- The total number of positions remaining for the next four years is 37 + 344 = 381. It will not sum to 340 (4 x 85) as there are excess positions remaining in the system (and some minor rounding).
- Although this analysis used headcount data, this analysis could have been undertaken using FTE data using the same methodology.

- The methodology used was a simple resource allocation method; however, no attempt was made to optimise the allocations to each specialty in each of three years. Knowledge of the optimising methodology and common sense in the allocation of resources is sufficient to ensure the workforce targets are heading in the correct direction. The above approximate solution is close enough to demonstrate that within four years (from end 2017) the 2021 target could easily be achieved.

22. Feminisation of the workforce

Female participation in the medical workforce has been increasing; between 1981 and 1991 female medical practitioners in Australia increased by 109.6%[55], and in 1999, 29% of all working doctors were women[56]. In 2012, 55% of the 3600 graduates across Australia were women. The vast majority of this cohort is now working within the medical workforce and many have either commenced or are awaiting entry into vocational training programs[57]. In Australia female participation rates in vocational training programs range from about 10% in surgery[58] to as high as 80% in obstetrics and gynaecology[57]. In WA, almost 90% of current obstetrics and gynaecology vocational trainees are women.

While both women and men are choosing to work fewer hours, retiring earlier, and increasingly requesting part-time training to fit around lifestyles[58], medical graduates are also getting older and "Too many medical graduates, particularly women, leave the workforce before completing their training because of difficulty in balancing study, work and family commitments. The cost in time and resources — for the individual and the community — is high."[59].

Consultation with medical specialty representatives has indicated that during the vocational training years women may choose to suspend their training due to family commitments, including pregnancy, and some will take maternity leave (up to 12 months and often two and occasionally three times) during their training. Although maternity leave is accommodated, it can cause major scheduling difficulties within the specialist training pathway and within the hospital setting, especially in training programs that are strongly female dominant.

In the SWCP 2013 analysis women accounted for 26.4% of the total consultant workforce (headcount). There are currently few female dominant WA consultant workforces. Of the moderate and high volume medical specialties (30 or more consultants) women represent the majority only in paediatric medicine (52.3%). In the small consultant volume specialties (less than 30 consultants) women represent the majority in public health medicine (73.3%), palliative care medicine (52.6%) and three very small consultant volume specialties (less than 8 consultants per specialty) where dominance may only be due to small sample bias. Palliative care medicine, public health medicine and the other three small volume specialties all have a young medical workforce.

In general:

1. Women represent the majority in most current vocational training programs (surgery remains strongly male dominant).
2. Women take longer to complete their vocational training programs (most likely due to family commitments).
3. Women are more likely to work part-time when trainees and when young consultants.
4. Women retire from the workforce at a younger age than men.

For the SWCP 2013 program:

- The impact of the first two points above (1. and 2.) is negated by using an annual vocational trainee attrition rate of 30% (which also compensates for a small number of trainees undertaking part-time training).

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[55] Levitt, Linda, (1999). *Women in the Medical Workforce Review*. New South Wales Rural Doctors Network. Accessed from http://www.nswrdn.com.au/site/publications

[56] Australian Medical Workforce Advisory Committee, (1996), *Female participation in the Australian Medical Workforce*.

[57] De Costa, C et al. (2013), *Integration parental leave into specialist training: experience of trainees and recently graduated RANZCOG Fellows*, Medical Journal of Australia, 199 (5): 359-362.

[58] Tomlinson, J. (2012). *Flexible Surgical Training in Australia: It's Time for Change*. Women in Surgery Section, Royal Australasian College of Surgeons.

[59] Katelaris, A. (2011). *The Women in Surgery Committee was established to encourage and support all Trainees, but females in particular"* – RACS Women in Surgery. Medical Journal of Australia. 2011; 194 (9): 435.

- The third point (3.) has little impact on SWCP analyses due to the high proportion of sessional and part-time contract positions available in WA.
- The fourth point (4.) currently has no significant impact on SWCP analyses as the older age groups remain strongly male dominant.

Further analysis of the data is required to determine the impact of female retirements on medical workforce supply. The challenge for medical workforce planners is how to minimise this impact by supporting females to re-enter the workforce at a time when they are ready to do so.

23. SWCP specialist profile report

An example of the SWCP specialist profile reports referred to in this document can be provided upon request.

This document can be made available in alternative formats on request for a person with a disability.