



Fact File

The Royal College of Pathologists of Australasia

Australian Pathologist Workforce 2018 Microbiology

AUSTRALIAN PATHOLOGIST WORKFORCE – MICROBIOLOGY

Overview

Microbiology deals with diseases caused by infectious agents such as bacteria, viruses, fungi and parasites. Microbiologists have roles both in the laboratory and in direct patient care. It offers involvement in a spectrum of activities ranging across:

- basic laboratory science
- direct patient care
- public health
- infection control
- research and teaching
- business management

The last two decades have seen enormous change in Medical Microbiology. 'New' organisms (*Helicobacter pylori*, HIV, Hepatitis C virus) have been discovered and characterised. 'New' infectious diseases (AIDS, Lyme disease, and Legionnaires' disease) have been described. 'Old' infections (tuberculosis, malaria, and pertussis) have re-emerged as major threats and have become increasingly resistant to previously effective antibiotics.

Over this time, advances in technology and molecular medicine (automation, polymerase chain reaction) have added greatly to the Microbiologist's diagnostic armamentarium. At the same time however, Microbiology remains very much a 'hands-on' discipline. In many ways it is an art as much as a science, and one in which an individual pathologist's experience, judgment and interpretive skills are pivotal.

Clinical aspects involve control of outbreaks of infectious disease and dealing with the problems of infections caused by antibiotic-resistant bacteria.

Workforce profile and trends

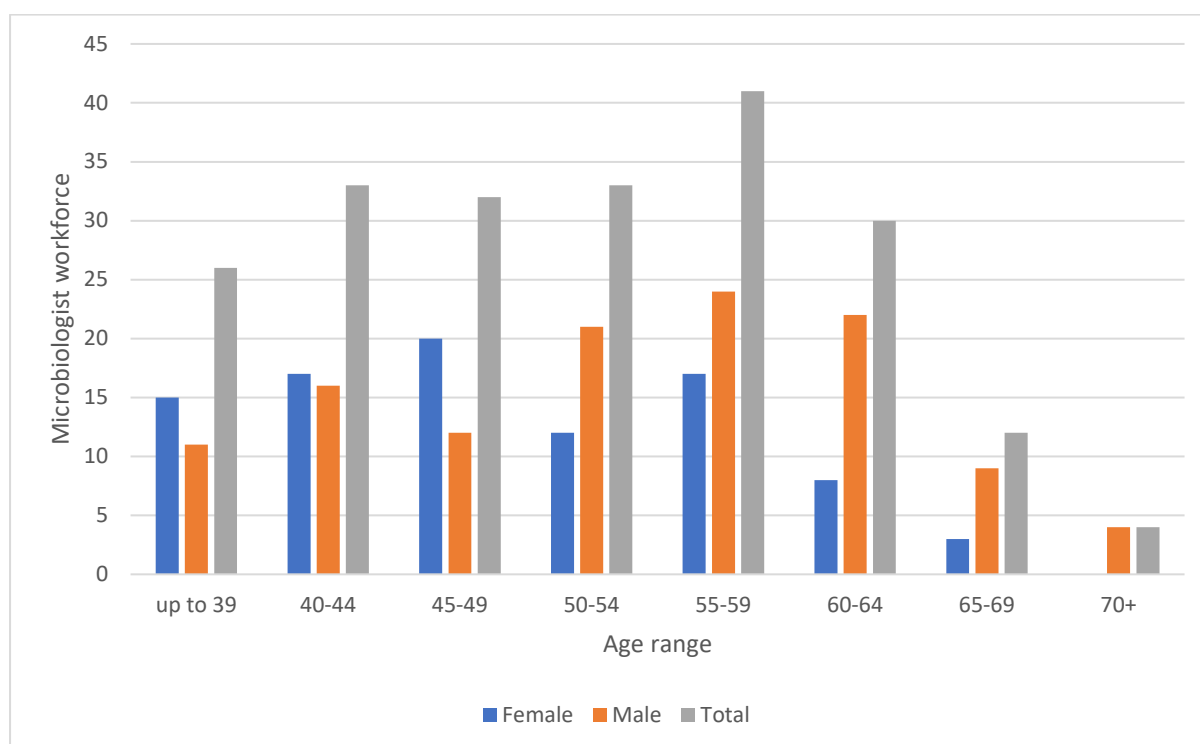
In 2016, the Microbiologist workforce was the third largest discipline, representing 11% of the total Australian Pathologist workforce (compared with 11.6% in 2011). The discipline experienced low growth per annum of 2.6% between 2011 and 2016, increasing from 187 to 211 practitioners over the period (Table 13).

Table 1: Microbiologist Workforce, 2016, Age and Sex Profile

Age Group	Headcount			Percentage	Percentage
	Female	Male	Total	by Age	Female by Age
up to 39	15	11	26	12.3%	57.7%
40-44	17	16	33	15.6%	51.5%
45-49	20	12	32	15.2%	62.5%
50-54	12	21	33	15.6%	36.4%
55-59	17	24	41	19.4%	41.5%
60-64	8	22	30	14.2%	26.7%
65-69	3	9	12	5.7%	25.0%
70+	0	4	4	1.9%	0.0%
Total	92	119	211	100%	43.6%
55 years and older	28	59	87		
% 55 years and older	30.4%	49.6%	41.2%		

Source: RCPA data base, 2016

Figure 1: Microbiologist Workforce, 2016, Age and Sex Profile



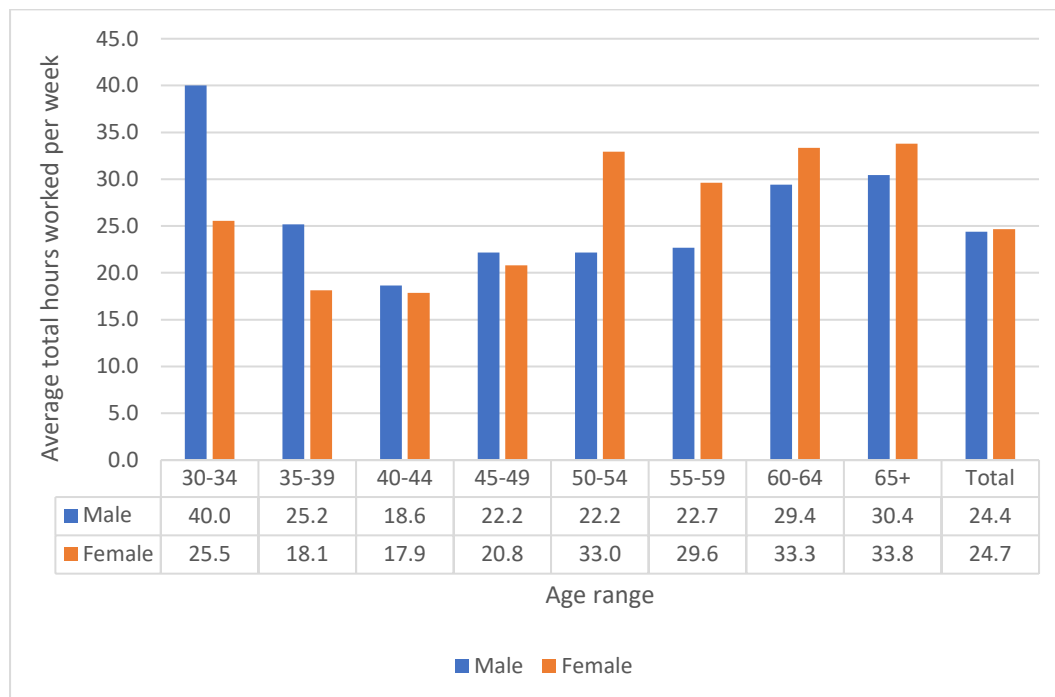
Source: RCPA data base, 2016

Table 2 and Figure 2 show that the modal age range for the workforce is 55 to 59 years, for the female workforce it is 45 to 49 years, and for the male workforce it is 55 to 59 years. Females are in the majority in each age cohort up to 49 years. Males are in the majority for all age cohorts 50 years and over.

Over four in ten of the workforce is older than 55 years (41.2%), with 30.4% of females in this age range, and just on one half of males (49.6%). This profile has significant implications for the retirement

of a large proportion of the workforce in the next ten years. There are 7.6% of the workforce aged 65 years and older, so that 16 Microbiologists nationally will retire in a much shorter time frame.

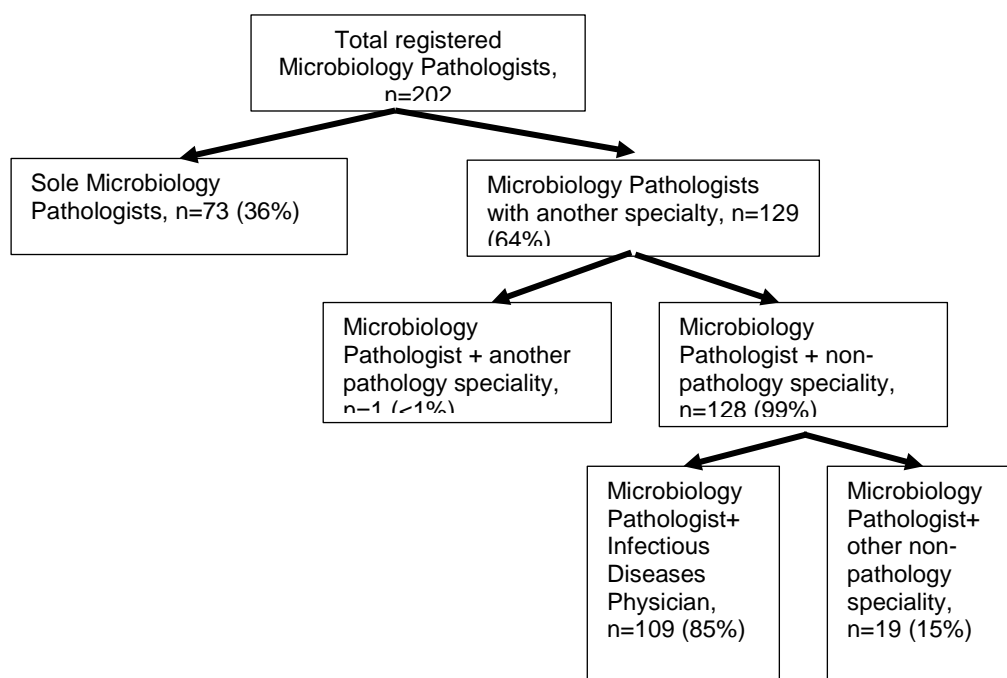
Figure 2: Microbiologist Workforce, 2016, Average Hours Worked by Age and Sex



Source: DoH Data Set, 2016

Microbiology is another discipline with a joint training pathway, and therefore has a fractional profile in relation to the Pathologist role. The discipline shows low average hours worked for both males and females (females 24.7 hours in total on average per week, males 24.4 hours). Males work on average higher hours per week for all age groups up to 49 years, and then females work higher average total hours per week from 50 years onwards.

Figure 3: Microbiologist single and multiple specialty profile, 2016



According to 2016 DoH Workforce data sourced from APHRA, there were 202 registered Microbiologists working in Australia (Figure 3). This is slightly lower than the 211 Microbiologists reported as working in Australia in the RCPA data base. Of these pathologists, just over one third (73, 36% of the total discipline) specialise solely in Microbiology and the majority of 129 (64%) work in another speciality as well. Of the 129 Microbiologists working in two specialities, all except one pathologist work in a non-pathology speciality as their second speciality. The most common second speciality, was as a Physician in Infectious Diseases, indicating the strong clinical role of Microbiologists. They accounted for 109 practitioners or 54.0% of the total workforce and 85% of those indicating a non-pathology speciality as their second speciality.

Trends in trainee numbers

Microbiology trainees increased from 43 to 65 trainees over the period 2011 to 2016. This was a very high growth of 51.2% over the period.

Workforce demand and supply

One driver identified what would result in high demand growth was value-adding, and Microbiologists are already contributing to multi-disciplinary management of patients as the role includes advice to other clinicians on the sequencing of ordering tests and antibiotic stewardship. These value-add consulting and advisory services are not identifiable as a billable cost and hence difficult to quantify.

The public health role has also been as a demand driver. Infectious disease epidemics create significant additional workload with requirements for quick turnaround times for results. There are also seasonal fluctuations with some epidemics and there is no additional capacity to manage this increased demand. These surges in demand are not acknowledged in funding arrangements. In addition,

antibiotic resistance is being taken seriously by government and therefore additional testing is required. These pressures result in less time available for other roles.

The discipline is also impacted by the increase in Infectious Diseases Physicians which has doubled over the last decade according to workshop participants. Therefore, the increases in medical specialist numbers in disciplines relevant to Microbiologists results in increasing rates of referrals to Microbiologists for testing.

Drivers having medium level impact on demand included population growth, cancer incidence/prevalence, efficiency improvements, genetic testing and complexity of testing. Rising levels of cancer incidence and prevalence will lead to increasing risk of infection resulting in increases in the volume of tests. In addition, prosthetic joints, heart valves and gastric banding procedures are being done more routinely resulting in increases in the risk of infection.

There was a view that there had been significant improvements in efficiency levels already and that precision medicine had been in place for some twenty years in Microbiology.

Microbiologists play a major role in Pathology Stewardship which involved educating clinicians about the appropriate and relevant ordering of microbiological investigations.

Further automation is imminent which will result in faster workflow, more testing and need for system reliability. It is likely that there will be the opportunity to share equipment and system platform that can be co-used with chemical and molecular testing.

Complexity was seen as a demand driver as more tests on samples per patient are being undertaken including sequencing to identify predisposition to specific illnesses.

Teaching and research was also identified as impacting on workload.

Clinical leadership at the laboratory level was identified as missing or lacking in regional and rural hospitals and hence metropolitan/urban based microbiologists have a regional responsibility in the public sector.

Joint training pathways for Microbiology and Infectious Disease physicians have significant implications for the supply of Microbiologists presenting challenges to maintaining laboratory clinical competencies and continuing professional development to maintain registration as a pathologist.

Table 2: Demand drivers for Microbiologists

Indicator	2011	2016	ACGR
High Scenario: Microbiology MBS Service Items	11,663,282	15,265,850	5.5%
Low Scenario: Workforce Size (Headcount)	187	211	2.4%

Source: Retrieved from: http://medicarestatistics.humanservices.gov.au/statistics/mbs_item.jsp

Note: Annual Compound Growth Rate (ACGR)

The High Scenario Growth in Demand using MBS services items was 5.5%. The Low Scenario Growth in Demand using workforce growth was 2.4%

Results of projection modelling

Figure 4: Results of Projection Modelling for Microbiologist Workforce, High Scenario (Service Demand)

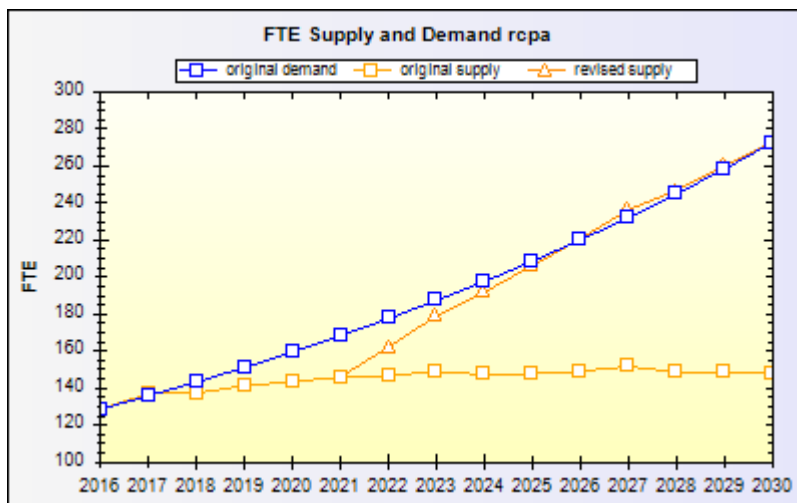


Figure 5: Results of Projection Modelling for Microbiologist Workforce, Low Scenario (Workforce Demand)

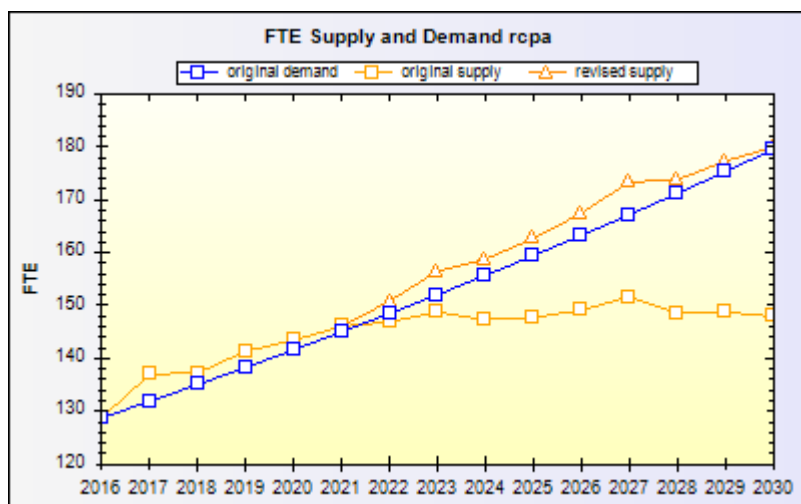


Table 1: Results of Workforce Modelling for Microbiologist Workforce

	Trainees				
	Base Year	Low Scenario	High Scenario	Gap Low Scenario	Gap High Scenario
	2016	2030	2030	2030	2030
Microbiology	7	14	36	7	29
Total six disciplines	97	151	238	54	141
Total Australian Workforce	100	170	192	70	92
	New Fellows				
Microbiology	6	13	32	7	26
Total six disciplines	87	138	213	51	126
Total Australian Workforce	90	153	173	63	83

The results of the projection modelling show that additional trainees were required under both scenarios, seven additional trainees for the Low Scenario and 29 additional trainees for the High Scenario. This is a large number of additional trainees for the output of the High Scenario service demand growth estimate, of 5.5% ACGR.

The age profile of the Microbiologist workforce is ageing with a modal age range of 55 to 59 years. At the same time there is 7.6% of the workforce aged 65 years and over. This shows that 16 practitioners will leave the workforce within the next five years. Therefore, the number of additional trainees needs to allow for this replacement as well as consider the joint role as a clinician and pathologist.