The demand for and supply of anaesthesia services in New Zealand 2010-2030
An Anaesthesia Workforce Study
by the Australian and New Zealand College of Anaesthetists

Executive Summary

The Australian and New Zealand College of Anaesthetists (ANZCA) has developed a New Zealand anaesthesia workforce study to contribute to the current discussion about the shape of our anaesthesia workforce in the future and how anaesthesia demand should be met.

Using data from a New Zealand anaesthesia workforce survey and anaesthesia service usage in New Zealand public hospitals, the study sought to determine the likely shortfall or surplus in the supply of anaesthesia services in New Zealand over the 20-year period 2010 to 2030.

ANZCA will use the scenarios tested and outcomes obtained as a tool for developing appropriate strategies to support the New Zealand anaesthesia workforce and the standard of services delivered.

The study is also intended to inform policy deliberations with the government on the critical issues of anaesthesia service delivery in the light of a rapidly ageing population. It therefore forms part of an important ongoing dialogue with the government and district health boards on the future of anaesthesia service delivery in New Zealand, the timely delivery of these services, and the maintenance of quality and safety standards within the profession.

Key Finding

The workforce study has identified a short-term shortfall in the supply of anaesthesia services with that shortfall increasing until about 2015, after which it will gradually diminish until equilibrium between supply and demand is reached. The time taken to reach that equilibrium can be reduced significantly if more new specialists can be retained in New Zealand and current specialists can be encouraged to work for longer than the age at which they indicate they intend to retire.

About anaesthetists

In addition to its supply and demand analysis, the study details the work of an anaesthetist because, few people – even other medical colleagues – understand just what is involved in administering anaesthesia or the full range of an anaesthetist’s work.

Anaesthetists are doctors who spend at least seven years in post-graduate training after graduating from medical school. This includes two years of pre-vocational experience and five years in specialist anaesthesia training.

In New Zealand, and Australia, that training is provided by ANZCA, which also sets clinical practice standards to ensure world class levels of safety and quality in anaesthesia. ANZCA trains as many anaesthesia trainees as New Zealand’s public hospitals choose to employ (currently about 250 a
year, spread over a five-year training period). It also assists with accrediting overseas-qualified doctors as specialist anaesthetists.

Anaesthetists’ work includes general anaesthesia and sedation, airway management, regional and local anaesthesia, pain medicine, perioperative medicine, resuscitation, trauma and crisis management, and safety and quality in anaesthesia practice. The pre-and post-operative medical services help ensure the effective coordination of a patient’s care during his/her stay in hospital in addition to monitoring the patient’s wellbeing and progress. Non-clinical work includes clinical leadership, administration, teaching, research, continuing medical education (a compulsory requirement), etc.

Supply of anaesthesia services
Towards the end of 2009, ANZCA, with support from the New Zealand Society of Anaesthetists, surveyed all ANZCA Fellows (those who have attained ANZCA’s fellowship qualification, FANZCA), other vocationally registered specialist anaesthetists and ANZCA trainees in New Zealand.

As well as demographic details, that survey sought information about qualifications and training, including by:
- country of origin
- expectation of departing New Zealand permanently in the next five years and the main reasons for that
- hours of work and a breakdown of work in terms of clinical and non-clinical work
- preference for working the same number, more or fewer hours
- age expecting to cease working as an anaesthetist
- location of practice and expectation of remaining there
- whether respondent grew up in a rural area
- factors determining choice of current location
- type of practice (public/private/other) and why that preference was favoured.

It also asked respondents to describe the adequacy of the current anaesthesia workforce, to identify any geographic or clinical gaps in meeting demand, what strategies would most likely succeed in addressing those gaps and what factors other than the medical workforce adversely affect the provision of anaesthesia services.

The survey drew a 75% response, producing excellent data about the current and projected supply of anaesthesia services.

The combined work of ANZCA Fellows, other vocationally registered anaesthetists, other doctors providing anaesthesia services under supervision and anaesthesia trainees (who deliver supervised clinical anaesthesia services through the ANZCA Training Program) was used to determine the total available supply of anaesthesia services in New Zealand.

Based on the survey data, on average an anaesthetist spends 47.6 hours each week delivering a mix of clinical services, with 30.6 hours of that spent on in-theatre anaesthesia delivery. The other 17 hours of clinical work includes pre- and post-anaesthesia care, intensive care, pain medicine, after-hours anaesthesia delivery and other medical practice. In addition, on average, another 7.6 hours per week is spent on non-clinical activities such as administration, teaching, research, compulsory
continuing medical education, etc. With these being averages based on survey responses, the work of individual anaesthetists can vary considerably from these figures.

While men account for two-thirds of the current overall anaesthesia workforce, women are training in increasing numbers, with 56% of trainees in 2009 being male and 44% being female. The study assumes that future trainee intakes will have a roughly equal gender split and will result in women accounting for 40% of the workforce by 2030. As female anaesthetists spend less time delivering in-theatre anaesthesia services, this affects the supply side of the model, which is predicated largely on in-theatre work. It should be noted, however, that the total time spent by female anaesthetists on all clinical anaesthesia services does not vary significantly from that of men.

**Demand for anaesthesia services**

ANZCA acquired public hospital data of actual in-theatre usage of anaesthesia services from which to calculate the demand for anaesthesia services. Being usage based, these data do not reflect unmet demand, just the actual demand that was being met.

That in-theatre data was extrapolated to calculate the demand for non-theatre and non-clinical work as well as work in private hospitals, based on ratios derived from answers to the survey as to how much of that work constituted the average anaesthetist’s overall practice.

**The supply/demand gap**

Using in-theatre work as the basis of calculations, the 2009 data revealed a notional shortfall in supply of 24 full-time equivalent anaesthetists (FTEs) – though as the demand data is based on actual usage, clearly that demand was actually being met somehow and the report comments on this.

The FTE gap was calculated by using the data to estimate the total annual number of hours of in-theatre anaesthesia supply (700,224 hours) and the total annual number of hours of in-theatre anaesthesia service usage (727,636). The gap in supply is the difference between the two – 27,412 hours. This was divided by 1,163 – the average number of in-theatre anaesthesia-delivery hours per year for the average anaesthetist – to reach the 24 FTE figure.

The study indicates that this shortfall will increase to about 33 FTEs by about 2014, after which the gap between supply and demand will gradually diminish. The point at which equilibrium is reached varies according to several scenarios that the study examines, but at the latest it would be reached by 2026, after which there would be a small surplus in supply.

While the variable used to assess the gaps in supply and demand in the workforce model has been in-theatre delivery of anaesthesia services, it should be noted that this service is only one component of the range of services that anaesthetists provide (though accounting for approximately 55% of their total workload). Intensive care medicine, pain medicine clinics, after-hour calls and other non-anaesthesia medical practice consume a large part of an anaesthetist’s time, particularly in rural areas where other medical specialists may not be available.

Any workforce calculations also need to allow for non-theatre clinical work and anaesthetists’ professional non-clinical duties, as well as the above in-theatre clinical workload.
While the survey responses indicated that, on average, anaesthetists were spending about 14% of their time on non-clinical duties, ANZCA’s recommended guidelines for specialist anaesthetists in teaching hospitals are that “clinical work should not exceed an average of 0.7 of specialists’ workload”, that is about 30% of time should be reserved for non-clinical duties. These duties include teaching, administration, research, continuing medical education (a compulsory requirement), quality assurance and audit, and others.

**Base case and scenarios**

The supply and demand data were used to develop a base case with assumptions that reflect the current supply and demand environments – average number of in-theatre clinical hours, historical growth in Fellows and overseas-qualified specialists, increase in female participation in the profession, retention of trainees, age at retirement, etc. Under this base case, a balance between supply and demand would be reached by about 2024.

In addition, the study models four other scenarios to quantify the potential effect of specific initiatives on the supply and demand gap.

Scenario 1 adds an extra hour a week of pre- and post-operative care to the average anaesthetist’s workload, thus reducing their availability for in-theatre work but meeting the call for anaesthetists to increasingly take on the wider perioperative role. As any difference between supply and demand in the model is based on in-theatre services, this scenario aggravates the shortfall in supply (to about 56 FTEs by 2014/15), so that it would take longer to reach equilibrium – until 2026.

Scenario 2 suggests that the supply can be increased if anaesthetists can be encouraged to retire at age 65 (or later) rather than at 62, the average age that the survey indicated they intend to retire. Under this scenario, the break-even point would be reached by 2018. However, the study notes that implementing this scenario could be challenging.

Scenario 3 suggests increasing supply by improving the new Fellow retention rate, an initiative that would see the supply/demand equilibrium reached by 2022. Approximately 40 to 45 trainees enter their final year of training each year. Of these, about 60% remain to practise in New Zealand, with the rest heading mainly to Australia, driven by the availability of desirable positions and higher salaries. The study suggests introducing specific incentives to help retain more new Fellows in New Zealand.

Scenario 4 combines scenarios 1, 2 and 3 – that is, while supply is adversely affected by increasing pre- and post-operative care, it is improved by pushing out the retirement age and retaining more new Fellows. Under this scenario, equilibrium would be reached by 2019.

Like all models, the study makes a range of assumptions that seek to mimic the complex pattern of variables that exist within the health services environment in which anaesthesia services are provided.

It takes into account New Zealand’s projected population growth to 2030, noting that the large increase in elderly patients will have a marked effect on the delivery of anaesthesia services (as for all health services), which will need to be considered in future health policy. It also comments on the likely effect of the forecast increase in the incidence of diabetes and obesity.
It does not attempt to take into account variables such as changes in government policy or technological developments, both of which can affect supply of and demand for anaesthesia services.

Conclusion
Assuming growth in the training and accreditation of new anaesthetists will follow historical trends, the results indicate a shortage in anaesthesia services over the next decade with equilibrium being achieved between 2018 to 2026, depending on the different scenarios considered.

The maximum size of the projected gaps varies from 33 FTEs in 2014/15 under the base case scenario to 56 FTE anaesthetists in 2014/15 under scenario 1 (where perioperative services are increased). These gaps are of a magnitude that can be readily addressed by adopting one or more of the initiatives outlined in the other scenarios.

This executive summary provides only a very brief guide to the study. A full copy is available on our website at www.anzca.org.nz or on request from ANZCA’s New Zealand National Office (email communications@anzca.org.nz).