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The Value of a Third Medical School in New Zealand: Competition and Dynamic Efficiency

University of Waikato

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Contents

1. Introduction and Summary

1. The New Zealand government is currently considering whether to expand the number of medical schools in New Zealand from two to three, by supporting the establishment of a medical school at the University of Waikato (the **WMS**). The WMS proposal is to establish a medical school with 120 government funded places. The WMS programme would be a 4-year graduate entry programme and would focus on primary and community care in rural and provincial areas.[1]
2. As part of the government's decision-making process, Sapere Research Group was commissioned to prepare a cost benefit analysis (the **Sapere CBA**) assessing the costs and benefits of establishing the WMS as against two alternative options:
   A. Allocating the 120 extra spaces between the existing medical schools at the University of Auckland (**UoA**) and University of Otago (**UoO**); and
   B. Giving UoA/UoO the extra 120 places but also establishing an interprofessional school of rural health within provincial and rural areas that would be jointly administered by UoA and UoO.[2]
3. The Sapere quantification focused on which option is most effective at producing rural GPs and found that despite the higher costs of establishing a third medical school, this option's costs are more than offset by its higher benefits.
4. The Sapere CBA contained only a high-level discussion and no quantification of the competition benefits that a third medical school would bring. We have therefore been asked by the University of Waikato to provide our independent assessment of the likely competition benefits that introducing a third medical school would bring.
5. As part of our assessment, we have provided high level estimates of the potential benefits of competition. These estimates have been calculated in a way that is consistent with the quantification approach in the Sapere CBA. Therefore, our quantified benefits are additive to the Sapere CBA.
6. A summary of our findings is as follows:
   A. In New Zealand, there is ***limited competitive tension for the allocation of the capped medical school places***.
      i. When the government agrees to fund more places, UoO and UoA agree the split of places between them rather than entering a competitive tender on quality and price.
      ii. This absence of competitive tension will result in less innovation in New Zealand medical education, and in taxpayers and students paying more than they should.
      iii. By contrast, in Australia there is an explicit process whereby expansions in government funded medical school places are subject to a competitive tender process.

[1] Ministry of Health, Memorandum of Understanding between the Ministry of Health and the University of Waikato, 13 February 2024, p.2.

[2] Sapere, Waikato Medical School cost-benefit analysis, 19 August 2024.

B. ***In Australia, taxpayers and medical students pay 25% ($17,859) less per year, per student than in New Zealand***.[3]

   i. This gap does not appear to be explainable by Australian medical schools having greater economies of scale or offering a lower quality product.

   ii. Closing this gap would save New Zealand taxpayers and medical students around $11 million per year.

C. ***New Zealand is big enough to support three medical schools***:

   i. New Zealand has the lowest ratio of medical schools to population in the OECD.[4]

   ii. UoA/UoO are currently two of the largest medical schools in the world (compared to Australia, the UK and the USA). There is thus a risk that they are "too big", leading to inefficiencies and worse student outcomes:

      a. Based on total enrolment, UoA is larger than all but one US medical school and 2 Australian schools.

      b. If UoA and UoO are given the 300 extra places they have claimed they can accommodate, they would both be bigger than *every* medical school in Australia, the UK and the USA.

   iii. The size of the WMS would not be an outlier/sub-scale compared to international benchmarks.

D. ***The Waikato Medical School would create competitive tension that would likely drive innovation and productivity gains***.

   i. With a different business model and cost structure, the WMS would be incentivised to disrupt the current allocation process and compete aggressively for government funded medical places in the future.

   ii. Modest productivity gains as a result of competition of 1-5% would save taxpayers and medical students $435,940 – $2.2 million per year.

   iii. This would be enough to fund an additional 6 to 32 medical places a year, which on Sapere's estimates of the value of additional GPs, would provide benefits to New Zealand with an overall present value of $62.8 million to $335.1 million at the lower estimate of benefits, and $123.6 million to $659.5 million at the upper estimate of benefits.

E. ***New Zealand is unusual in not having a 4-year graduate entry medical degree***.

   i. In Australia, 12 out of the 21 universities offering a medical degree offer a 4-year graduate entry medical degree.

   ii. Approximately 30% of medical students entering UoO and UoA are graduates but are required to take a 5-year program.

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[3] This value is in NZD. Values in AUD were converted to NZD using a long run exchange rate, calculated using the longest time frame that the RBNZ exchange rates series is available (January 1999 to February 2025).

[4] This excludes Luxembourg, which does not have a medical school. See MartinJenkins, Medical schools per capita for OECD countries memo, 20 February 2025.

iii. If UoA and UoO medical students who are graduates took a 4-year programme at those (or other) universities, taxpayers and students would save $13.1 million per cohort.

iv. This saving would allow approximately 40 additional medical graduates per cohort to be trained for the same outlay by taxpayers.

v. Based on Sapere's estimates of the value of additional GPs, the extra medical school places associated with enabling graduates to take a 4-year medical degree would result in a benefit to New Zealand with a present value of $408.4 million to $948 million.

F. ***Innovation in medical education could also lead to downstream benefits:***

i. Innovations in medical education from increased competition can lead to better downstream outcomes to society in the long run in the form of better patient outcomes and productivity improvements for existing and future doctors.

ii. The Commerce Commission estimates dynamic efficiency (i.e. innovation) gains/losses as competition changes as a percentage of industry revenue in the relevant market. We measure the size of the downstream market conservatively using cumulative GP salaries[5] and find that even small gains in efficiency of 0.5-1% would lead to benefits of $42 million to $83.9 million in present value terms.

7. In the rest of this paper we:

A. Describe why competition is important and the productivity/innovation it drives (section 2)

B. Assess the current medical education market in New Zealand and set out features which suggest there is limited competitive tension between UoA/UoO (section 3)

C. Describe the medical education market in Australia, which provides a useful benchmark for what more competition might look like (section 4); and

D. Assess the likely competition benefits of the WMS proposal (section 5).

[5] We take an estimate of the number of GPs and an estimate of the average salary of a GP and multiply them together.

2. Why competition matters

8. Competition can be described as the rivalry between businesses within a market as they attempt to attract and retain customers.[6] Competition drives firms to make efficiency and productivity improvements in order to gain an advantage over their rivals, and these improvements lead to better outcomes for end users.

9. The intensity of competition often depends on market characteristics such as the number of firms in the market, the ability for new firms to enter the market, the variation in products or services offered, and the relative size of the businesses present in the market.[7]

10. Having multiple competing providers results in a rivalrous process to attract consumers. This process may result in providers reducing their costs and prices, improving the quality of their goods and services, and even introducing new products into the market. If a provider does not make any adjustments, then others likely will and the provider will lose customers to its rivals.

11. For example, in markets with healthy competition, providers will have no incentive to increase prices beyond efficient levels because if a provider significantly increases its prices, it risks being undercut by their competitors and losing its consumers.[8] This benefits consumers because they will pay the lowest efficient price for goods and services.

12. Additionally, competition also leads to providers trying to be as efficient as possible with their resources. To retain existing consumers and attract new ones, providers need to be able keep their input costs as low as possible, otherwise they will lose consumers to competitors who can provide the same good/service at a lower cost. This benefits consumers because providers in competitive markets pass on their cost savings in the form of lower prices for consumers.

13. Often this drive to be efficient involves new innovations and improvements to processes over time. With competition, providers have an incentive to innovate as it allows them to differentiate themselves and gain a competitive advantage.[9] This also benefits consumers, as these innovations will likely lead to providers improving quality, providing new products or services, and seeking cost efficiencies (leading to even lower prices) in order to gain a competitive advantage. Having innovation in a market is crucial as it maximises the long-term welfare of consumers. In particular, innovations leading to new products result in large gains for consumers as new markets are created, which has greater welfare impacts than marginal improvements in existing markets.

14. In contrast, having a small number of providers is less likely to deliver improvements. There is little to no pressure from other organisations trying to take a provider's existing consumers, and therefore there is no incentive for them to make any improvements to their products or services. Since innovation normally requires costly investment, the absence of competitive pressures lessens the incentive for organisations to undertake these investments. This is likely

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6 New Zealand Commerce Commission, Competition Assessment Guidelines, January 2023, p. 1.

7 N. Gregory Mankiw, Principles of Microeconomics sixth edition (South-Western Cengage Learning, 1991), pp. 330-331.

8 N. Gregory Mankiw, Principles of Microeconomics sixth edition (South-Western Cengage Learning, 1991), pp. 66-67.

9 Arrow, K.J. "Economic Welfare and the Allocation of Resources for Invention" in *Readings in Industrial Economics*, ed. C.K. Rowley (London: Palgrave, 1972), p. 619.

to leave consumers worse off because they will not benefit from the lower prices and higher quality goods that might have arisen in a more competitive market.

3. Competition between medical education providers in NZ

3.1. The capped funding model imposes a capacity constraint which likely mutes competition today

15. Universities face a cost structure with large fixed costs in the form of infrastructure and staff. If a university is not currently at capacity, then the additional costs of admitting another student for an existing subject will be relatively small, as these costs are mostly made up of the basic educational materials needed to teach an additional student. However, once the capacity is reached, admitting more students requires large investments in infrastructure to increase capacity, such as the costs of constructing new buildings, laboratories, and faculty, as well as the costs of hiring additional staff. In medical education, there may be further investment costs associated with establishing additional clinical training sites to accommodate more medical students.

16. An important aspect of medical education markets in New Zealand compared to other subjects is that there is a binding cap on the number of domestic students admitted into the programme each year. This cap is maintained by the government because every medical student is partly funded by the government and training medical students is very expensive.[10]

17. This cap is effectively a capacity constraint. The economics literature suggests that capacity constraints can dampen competition by limiting providers' ability to expand output.[11] Intuitively, if a provider does not have the capacity to serve an additional customer, it will not try and win more customers. In the medical education market, there is excess demand since medical schools receive more applicants each year than they have places available, which is why the cap is binding.[12]

18. If the cap is simply market wide and competition is allowed "within the cap", then we might still expect competition to occur. However, there are individual caps for domestic students for each university, which means each university is in effect capacity constrained.

19. While capacity constraints may dampen competition between existing firms, in the medical education context in New Zealand it also eliminates the threat of entry, which can also be a constraint on the behaviour of existing universities. This is because an entrant would need to be given an allocation of the cap in order to compete. This significantly reduces any competitive pressure the incumbent institutions might face.

20. While it is possible that the universities are competing in an international market, the subsidisation of domestic students means there is an asymmetry in cost for a New Zealander

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10 Medicine is the second highest of the funding categories that the Tertiary Education Commission uses to provide per-student government funding to tertiary institutions (behind dentistry). Further, using data from the Tertiary Education Commission, the median annual funding across all categories is $15,983, which is significantly smaller than the $52,553 annual funding for medical places.

11 Soderbery, "Market Size, Structure, and Access: Trade With Capacity Constraints," *European Economic Review* 70 (August 2014): p. 277.

12 For example, a recent PwC report commissioned by UoA and UoO notes that there are 1,750+ applicants for the 589 government-funded domestic places for medical students. Source: PwC, Medical education in New Zealand: Current state and consideration of future options - University of Auckland and University of Otago - Final report, July 2024, ("PwC report on medical education in New Zealand"), p. 15

studying domestically vs offshore. Even in Australia, where a New Zealand student is eligible to fill a Commonwealth supported place, and would thus pay domestic fees, New Zealanders in Australia may not be eligible for Australian or New Zealand student loans.[13] Given there is material excess demand for medical school places in New Zealand, student numbers are subject to a cap, and only a fraction of potential students are admitted each year, it seems unlikely that foreign medical schools are a material constraint on behaviour of the existing New Zealand medical schools today.[14] For completeness, we note that there are currently estimated to be 350 New Zealand students studying medicine in Australia. However, accounting for this still leaves material excess demand faced by UoO/UoA (i.e. it is not the case that students that UoA/UoO can't take are simply absorbed by Australia). As we discuss in section 4, Australia's broader graduate entry pathway likely means that some of these students are graduates who do not have an undergraduate science degree and who could do a 4-year postgraduate programme in Australia instead of a 6-year undergraduate program in New Zealand.

21. Finally, even with the capacity constraint, there may still be incentives to compete among the incumbent institutions, such as attracting the best students. Attracting the best students may help improve their reputation, which may have other benefits, such as attracting external donations and students to other disciplines. However, given demand vastly outstrips supply, there is unlikely to be much differentiation in the students each NZ medical school attracts today.

3.2. Numerous features of the market are suggestive of a lack of competition

22. At present, the market for medical education in New Zealand is highly concentrated, with two universities operating in a duopoly structure for the training of government funded medical student places. To train as a medical doctor in New Zealand, students must gain entry to a Bachelor of Medicine and Bachelor of Surgery (MBChB) at UoA or UoO.

23. The market exhibits a number of features suggestive of a lack of competition.

    a. **Limited competition for government funded places:** The spaces that the two providers are able to offer to domestic students is managed by the Tertiary Education Commission (**TEC**). The government decides the medical school funding cap, and once this is approved, the TEC will then determine the allocation of additional places across each of the medical schools. When determining the allocation, it appears that this decision is essentially left for UoA and UoO to discuss between themselves and decide what the best split should be, after which the proposal is given to the TEC for consideration, with the TEC having stated that:[15]

[13] "Study in Australia", Australian High Commission New Zealand, accessed 21 March 2025, https://newzealand.embassy.gov.au/wltn/study.html.

[14] While UoA and UoO do also admit foreign students, who presumably have the option of studying offshore, these students make up a very small proportion of medical students at UoO/UoA. Data from the Medical Deans of Australia and New Zealand shows that in 2024 there 2948 medical students at at UoO and UoA, with 163 of these (i.e. 5.5%) being international students.

[15] Tertiary Education Commission, Medical School Cap: History and allocation process, 4 February 2025.

> *The Universities of Otago and Auckland are usually given the opportunity to discuss and propose a split between them to TEC.*

Consistent with this, in an internal letter from the dean of the UoA Faculty of Medical and Health Sciences to the University senate regarding the 2024 increase in the total funding limit by 50 students, the dean notes a discussion was had with UoO on the allocation of places:[16]

> *Following the approval of the 2024 Programme Limitations, the Government announced additional funding for domestic medical students.* ***Acting Dean of the Faculty of Medical and Health Sciences (FMHS) Warwick Bagg has discussed this matter with his counterpart at the University of Otago and has confirmed that FMHS can now accept 30 additional domestic students into the MBChB programme in 2024****. [emphasis added]*

There appears to be limited competition for the allocation of government funding.

b. The degree structure and entry requirements across both universities is essentially the same:

   i. **The medical degree programme structure is the same across both providers**. Students seeking to gain entry into a medical school must complete a general first year health science program after which they gain competitive entry into the 5-year MBChB.[17] The MBChB consists of 2 years of study on campus followed by 3 years of clinical placement.

   ii. **No 4-year graduate entry option despite almost one third of entrants being graduates:** If students are not offered a place after their first year of the health sciences programme, they are encouraged to complete their degree at UoA or UoO, as the universities offer places in medicine available to graduates. The graduate entry pathway also allows students with degrees from other universities to enter medicine, however, if these students are missing some or all first-year papers (from the health science programme), they will be required to undertake additional prescribed courses.[18] If graduate entry is approved (and the required health science courses are completed), students will still need to complete the 5-year undergraduate programme. On average, these students made up 27% and 35% of UoO and UoA's total intake respectively between 2017 and 2023.[19]

   iii. **Limited differentiation in targeted entry schemes**: Both medical schools have targeted entry schemes for Māori, Pasifika, rural, low socio-economic, and refugee

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16 Professor John Fraser to Senate, 20 July, 2023, Bachelor of Medicine and Bachelor of Surgery (MBChB) – Updates to Programme Limits, University of Auckland Faculty of Medical and Health Sciences, https://fyi.org.nz/request/23585/response/89500/attach/4/Late%20item%2010.Ca1%20Memo%20re%20MBChB%20Selection%20Criteria%20Changes%20for%20Senate.pdf

17 Students at the University of Auckland can also apply after completing the first year of a biomedical sciences specialisation in a Bachelor of Science programme.

18 "Medicine: Guidelines for admission," University of Otago, accessed February 25, 2025, https://www.otago.ac.nz/healthsciences/students/professional/medicine#graduatehttps://www.otago.ac.nz/healthsciences/students/professional/medicine#graduate

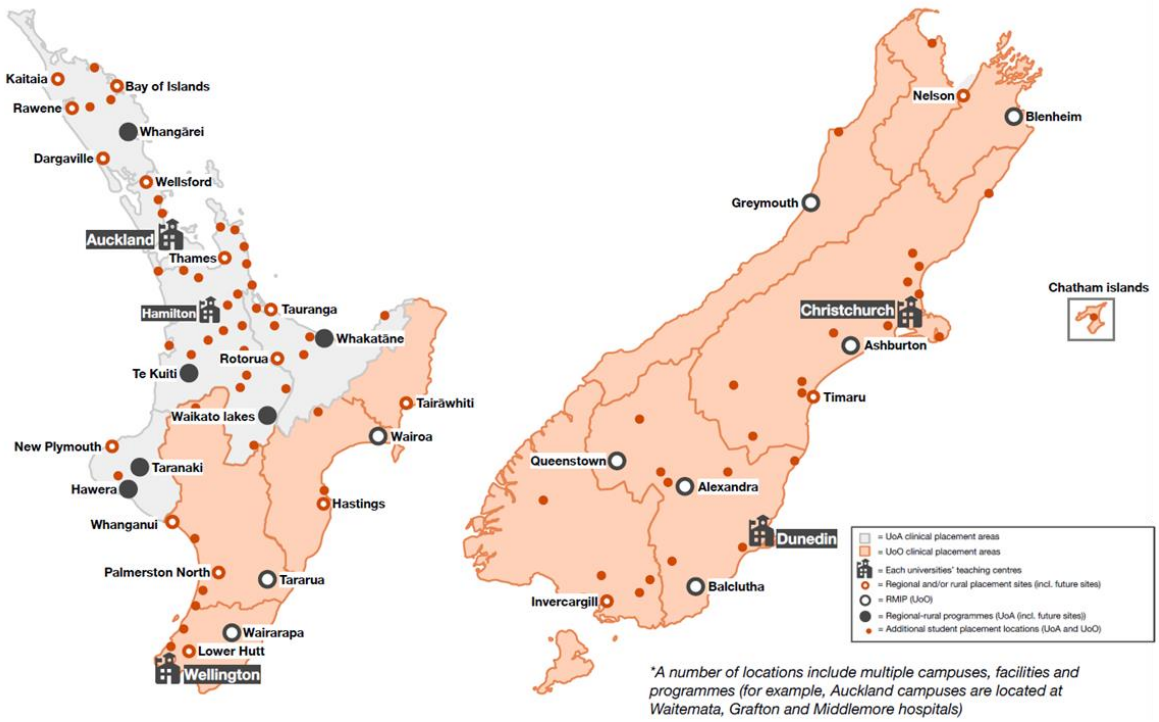
19 Ministry of Health, New Medical School Programme Business Case (PBC), 9 September 2024, p. 20.

students. UoA has an alternative entry scheme for students with disabilities whereas UoO does not.

c. **Forced bundling of pre-med and medical degree:** UoA and UoO do not accept first year health science grades from other universities, although we understand from the University of Waikato this used to be standard practice via a number of medical intermediate programmes up until the 1990s. This bundling means, for example, if a high school student seeks to accelerate their study options by taking a health science paper at a university other than UoA or UoO, they rule themselves out of the health sciences first year entry. This is because UoA and UoO require first-year entry applicants to complete all 8 first-year courses at their universities in the year preceding the start of the medical degree.[20] This could be interpreted as a barrier to entry and a leveraging of market power in one degree programme into a another. This forced bundling of pre-med and medical school allows UoA and UoO to maximise their enrolment in health science papers, but it limits student choice, making students worse off.

d. **Geographical division in clinical placements:** UoA and UoO divide the country between them for clinical placements. This is shown in Figure 3.1 below. While there may be some efficiencies associated with this geographical coordination, the geographic division is stark.

Figure 3.1 Current UoA and UoO clinical placement coverage across New Zealand



Source: PwC report on medical education in New Zealand, p. 11

[20] See the entry requirements "Category One: First Year entry from BHSc or BSc (Biomedical Science) Only) in "Bachelor of Medicine and Bachelor of Surgery", University of Auckland, March 21, 2025, https://www.auckland.ac.nz/en/study/study-options/find-a-study-option/bachelor-of-medicine-and-bachelor-of-surgery-mbchb.html and "University of Otago Health Sciences First Year (HSFY) category" in "Medicine: Guidelines for Admission", University of Otago, accessed March 21, 2025, https://www.otago.ac.nz/healthsciences/students/professional/medicine.

4. Australian medical education is a useful benchmark for what competition might look like

24. Australian medical education offers a useful benchmark of what a more competitive medical education market might look like. Australian medical schools offer greater choice for students, as there are different types of programmes on offer, different pathways into medicine degrees, and more medical schools. The benchmark presumes that NZ and Australian medical schools provide a similar quality education. In this regard, we note that Medical Council of New Zealand and the Australian Medical Council jointly assess medical schools for accreditation purposes, which suggests that they all have to meet the same standard.[21]

25. While New Zealand only has two medical schools, Australia has 22 primary medical schools.[22] There are different types of degrees available from these 22 schools, with some offering longer undergraduate degrees available to students leaving high school (typically 5-6 year degrees), and others offering shorter post-graduate programs that are available to students who have already completed an undergraduate degree (typically 4-year degrees). Importantly, in many cases this undergraduate degree can be in any subject and does not need to have been taken at the same university. This is the case at Australia's top ranked medical schools, the University of Melbourne and the University of Sydney, where the academic entry requirements are based on having an undergraduate degree in any discipline and performance in the Graduate Australian Medical School Admissions Test (GAMSAT).[23]

26. An overview of the 22 Australian primary medical schools categorised by programme type is shown in Table 1 below.

27. In addition to offering a shorter alternative to the undergraduate pathway, Australia's medical education system offers joint medical programmes. These are medical programmes that are operated by two universities and accept entrants from both universities, such as the University of Newcastle and University of New England Joint Medical Programme. Australian medical schools also offer simpler graduate entry pathways through the standardised GAMSAT test (as already mentioned) and networks of rural medical school programmes that offer rural clinical placements, which have been shown to lead to more graduates serving high needs communities in primary care.[24]

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21 See, e.g. https://www.amc.org.au/accredited-organisations/medical-schools/assessment-and-accreditation-of-primary-medical-programs-medical-schools/ and https://www.mcnz.org.nz/registration/medical-education/undergraduatesmedical-schools/. Accessed 26 March 2025.

22 A primary medical school teaches a medical programme that is required to register as a medical practitioner. There are 22 accredited medical schools in Australia. Some schools are jointly run by two universities, for example, the Universities of Newcastle and New England run a joint medical programme, and some universities have two schools, such as the University of Notre Dame. See "Accredited medical schools," Australian Medical Council Limited, accessed 31 March 2025, https://www.amc.org.au/accredited-organisations/medical-schools/accredited-medical-schools/.

23 As ranked by the 2025 QS world university rankings. https://www.topuniversities.com/university-subject-rankings/medicine?countries=au . Accessed 12 February 2025.

24 Seal et al., "Association Between Rural Exposure/Experience and Practice Location 10 Years Postgraduation, stratified by specialty: evidence from a cohort study of graduates from nine Australian universities", BMJ open 14, no. 6 (June 2024)

Table 1: Undergraduate and Graduate medical schools in Australia

Undergraduate programmes	Graduate-entry programmes
Bond University	Australian National University
Charles Sturt University and Western Sydney University Joint Medical Programme	Deakin University
Curtin University	Flinders University
James Cook University	Griffith University
Monash University	Monash University
University of Adelaide	Macquarie University
University of New South Wales	University of Melbourne
University of Newcastle and University of New England Joint Medical Programme	University of Notre Dame Australia (Fremantle)
University of Tasmania	University of Notre Dame Australia (Sydney)
	University of Queensland
	University of Sydney
	University of Western Australia
	University of Wollongong

Source: NERA analysis of university websites.
Notes: Monash University offers two pathways into the same medical programme: a school leaver pathway and a graduate pathway. For school leavers, the programme takes five years to complete, which includes two pre-clinical years. For graduates, the programme takes four years to complete by combining the two pre-clinical years into a single "Year A." The final three years of the programme are the same for both types of entrants. Melbourne has a separate rural programme operating in Sheparton where the places are shared with La Trobe University, however we categorised this under the University of Melbourne. The University of Notre Dame's National School of Medicine has two accredited medical schools in Sydney and Fremantle. Western Sydney University has been accredited as a medical school separately from Charles Sturt University, but now runs a joint programme with Charles Sturt University, so it is listed once along with Charles Sturt University in this table.

28. Most importantly however, when the Australian Government wants to increase the number of government-funded medical places, known as Commonwealth supported places (**CSP**s) in medicine, medical schools must submit a competitive proposal that outlines why they are best suited to receive these additional medical CSPs.[25]

29. Within these proposals, the medical school must disclose key information such as costs, the number of CSPs they are applying for, and the rationale behind the proposal, including how it will address important gaps in Australia's medical workforce.[26]

[25] Australian Government Department of Education, Assessment Framework for proposals for medical schools or medical Commonwealth supported places (CSPs), 11 May 2023, ("Australian Assessment Framework for CSP proposals") p. 1.

[26] Australian Assessment Framework for CSP proposals, p. 2

30. The proposals are then assessed by an expert panel that will then make recommendations to the Minister for Education who consults with the Minister for Health and Aged Care before coming to a final decision.[27]

31. In contrast to New Zealand's process, Australia's framework explicitly introduces competition between medical schools when the government wants to expand the number of places it funds. Instead of leaving it up to the universities to decide the allocation of any new funding for medical students, Australia's framework requires independent proposals that are transparent in their costs, how many medical CSPs they request, and the rationale for their proposal. This is illustrated by the recent contestable process that Australia had for expanding CSPs in medical schools by 160 places with a focus on rural communities. The minister described this as a competitive process:[28]

> ***Universities with existing medical schools were selected through a competitive grants process*** *and will receive capital, establishment and recurrent costs to support the new facilities and programs. [emphasis added]*

32. This is likely to result in Australian medical schools competing for the funding that is made available, which may incentivise them to innovate by improving student outcomes, targeting their proposal to the government's identified need (e.g. training rural doctors) and increasing efficiencies, as this would maximise their likelihood of getting their proposal approved. This process will also induce revelation of information to the funds allocation authority on new and existing approaches.

33. While caution is required when making the following comparison, as medical schools get funding from other sources besides domestic student fees and government funding, the combined cost to the taxpayer and domestic students is much lower in Australia than in New Zealand. This is shown in Figure 4.1 below. The combined government and student contribution is $53,141 per year in Australia on average, compared to New Zealand's average of $71,000, which is comprised of $52,553 government funding and average student fees of $18,447 per year.[29]

34. Focusing on the difference in the annual fees/government contributions understates the total difference in fees, given many degrees in Australia are 4-year postgraduate degrees. In Figure 4.2 below we show the total student fees and government contribution for different medicine degree lengths in Australia compared to the 5-year program in New Zealand. This shows the stark difference in government funding and student fees between a 4-year postgraduate degree in Australia and the undergraduate program offered in New Zealand. While a postgraduate degree requires the entrant to have completed an undergraduate degree, and some might claim that the cost difference of the undergraduate vs post-graduate degree is overstated, this claim would need to be balanced against the fact that:

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27 Australian Assessment Framework for CSP proposals, p. 1

28 See https://www.health.gov.au/ministers/the-hon-mark-butler-mp/media/new-medical-school-programs-put-doctors-where-theyre-most-needed-in-regional-australia. Accessed 31 March 2025.

29 The Australian value of $53,141 is expressed in NZD using a long run exchange rate, calculated using the longest time frame for the RBNZ exchange rates series is available (January 1999 to February 2025). The New Zealand value of $71,000 is the government funding rate of $52,553 per student plus the average of the annual fees at UoO ($18,432) and UoA ($18,462).

A. Approximately 30% of entrants to the 5-year undergraduate medicine degree in New Zealand do so via the postgraduate entry pathway and thus have completed an undergraduate degree;

B. Many students taking the graduate entry pathway in Australia may be people who have an unrelated undergraduate degree and are making a career change later in life (and hence the undergraduate degree is a sunk cost in terms of financial outlay required to do a medical a degree); and

C. In New Zealand, the 5-year undergraduate degree is actually a 6-year program, given the requirement to take first year health sciences.

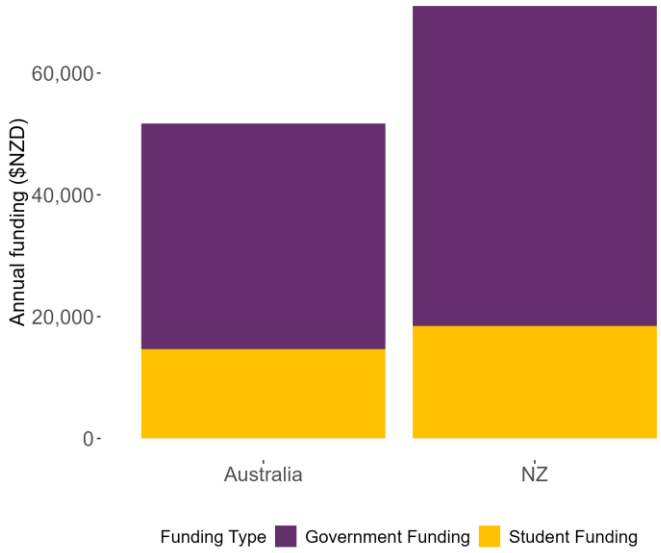
35. Given Australia is a bigger country than New Zealand, it is possible that the difference in per year and total costs to taxpayers and medical students is explained by economies of scale, i.e. with universities having large fixed costs, we might expect Australian medical schools to be able to train medical students more cheaply than a New Zealand university since Australian universities have more students from which to recover their fixed costs.

36. However, asFigure 4.3 and Figure 4.4 below demonstrates, this is not the case, with only two Australian medical schools having more annual enrolments than UoA and 3 having more total students than UoA.[30] More broadly, UoO and UoA appear to be of a similar size to the largest Australian schools and are much bigger than most Australian medical schools. Furthermore, New Zealand currently has the lowest ratio of medical schools to population in the OECD, nearly half the number that would be expected based on the OECD average.[31]

[30] Monash University and the University of New South Wales have more enrolments than Auckland and Otago. The University of Melbourne is also larger than Otago.

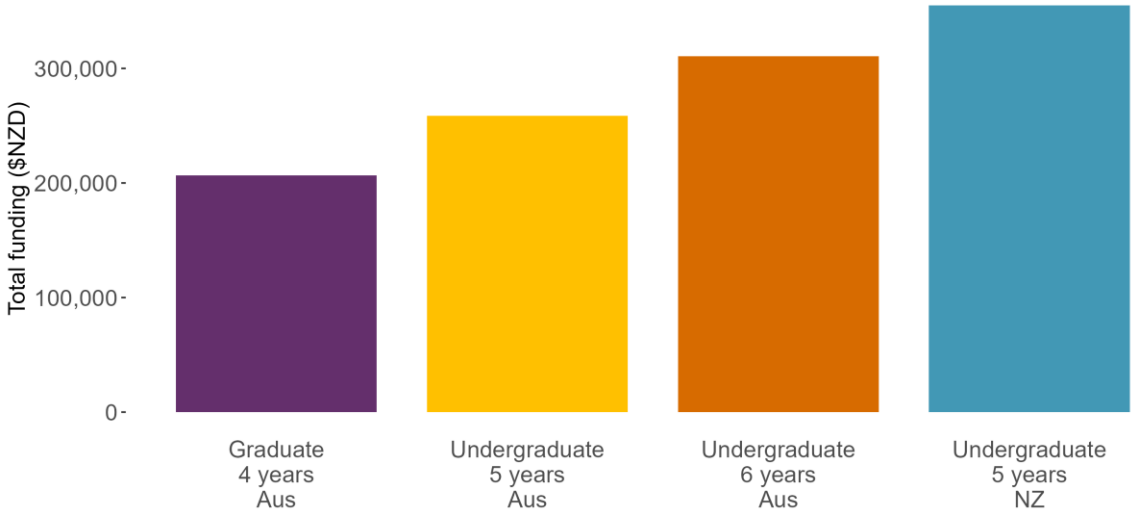
[31] MartinJenkins, Medical schools per capita for OECD countries memo, 20 February 2025.

Figure 4.1: Government funding and student fees per domestically supported student in Australia and New Zealand for 2025 (averaged across universities)



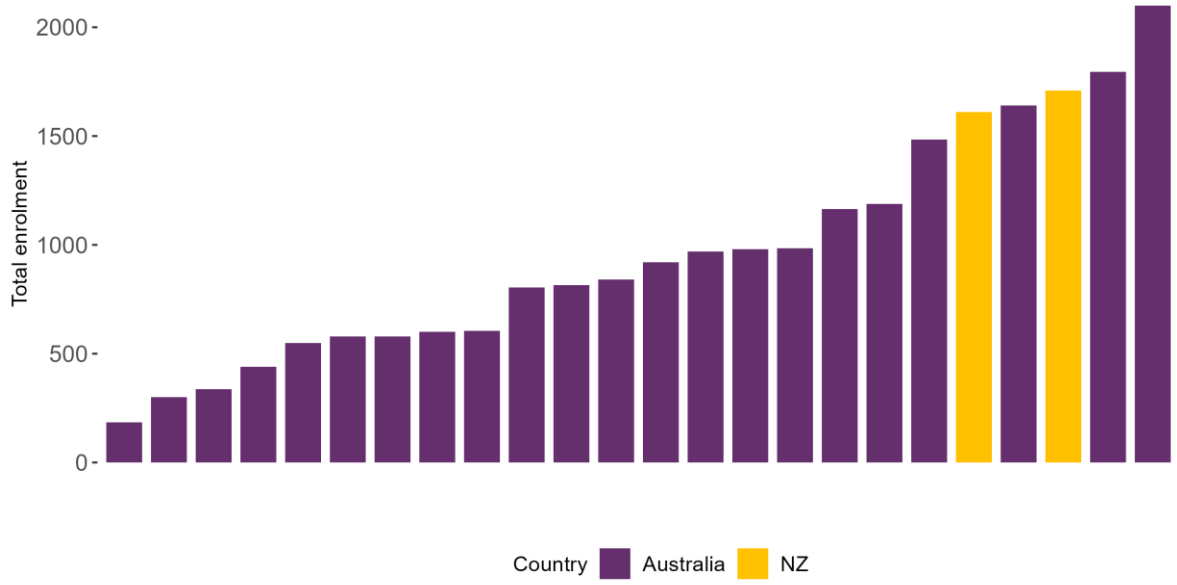
Source: NERA analysis of data from Australian Government Funding Agreements, the University of Otago, the University of Auckland & the Tertiary Education Commission.
Notes: All values have been converted to NZD using a long run exchange rate (January 1999 to February 2025). These values represent government funded places and therefore do not include costs for full fee paying places or international places. Domestic funding is capped so variation across medical schools is insignificant. Therefore, an average is taken for each country. The government funding for Australian medical schools is a combination of the basic grant amount per student and the loading per student.

Figure 4.2: Total government funding and student fees per domestically supported student in Australia and New Zealand for 2025 (averaged across universities)



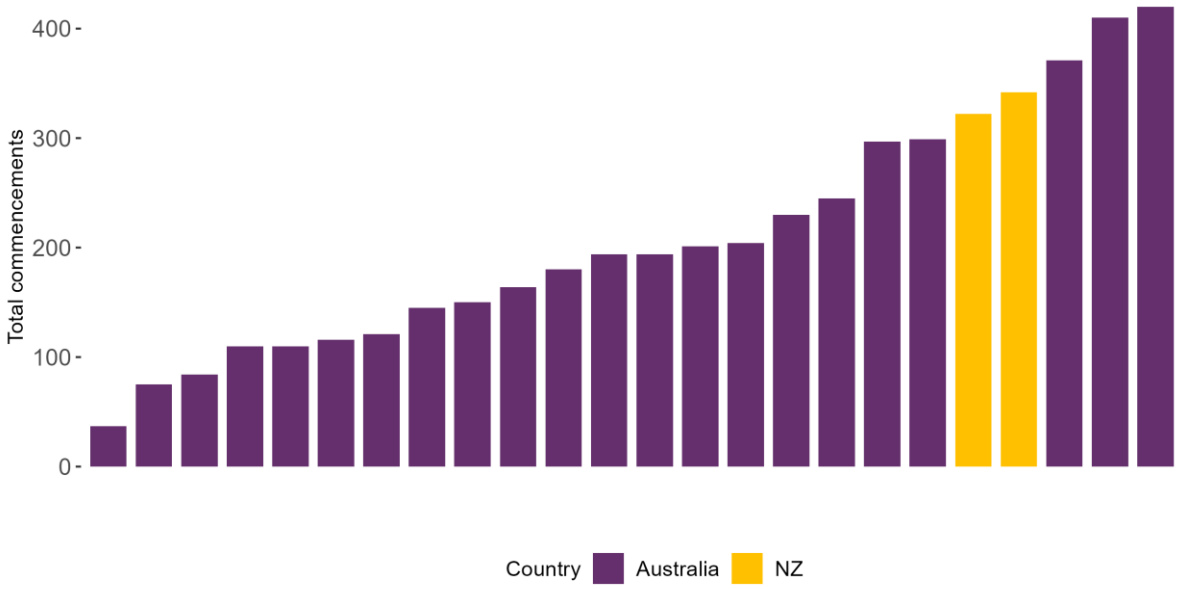
Source: NERA analysis of data from Australian Government Funding Agreements, the University of Otago, the University of Auckland & the NZ Tertiary Education Commission.
Notes: Calculation of annual funding is as for Figure 4.1. Total funding is calculated by multiplying duration of degree by annual funding.

Figure 4.3: Total enrolment for NZ and Australian medical schools for 2025



Source: NERA analysis of data from Australian Government Funding Agreements & PwC report on medical education in New Zealand.
Notes: Total enrolment for Australian and New Zealand medical schools is calculated by multiplying the data for the annual commencements (entering cohort) by the duration of each university's degree. Annual commencement values are the maximum number of commencements a school can accept based on its funding cap and thus may differ from actual commencements. This data also includes international and domestic full fee places.

Figure 4.4: Annual commencements for NZ and Australian medical schools



Source: NERA analysis of data from Australian Government Funding Agreements & PwC report on medical education in New Zealand.
Notes: Annual commencement values are the maximum number of commencements a school can accept based on its funding cap and thus may differ from actual commencements. This data also includes international and domestic full fee places.

5. Competition benefits from the Waikato Medical School

5.1. Basic outline of the WMS proposal

37. The University of Waikato has proposed a new medical school, which we understand would have the following characteristics:

    A. Graduate entry only, with four years of study, the first year in Hamilton and then years 2, 3 and 4 based primarily in regional clinical placements.

    B. Entry based on a degree in any subject at any University, with a requirement for a GAMSAT test to demonstrate knowledge in topics relevant to medical practice.

    C. A pathway programme from another New Zealand university, allowing the medical school to recruit students and manage clinical placements in the South Island.

    D. Purchase of curriculum, expertise, and support for accreditation from the University of Wollongong in Australia given that they have the strongest track record in Australia for their graduates working in primary care. A recent study shows that 42.7% of graduates from the University of Wollongong specialise in General Practice, compared to 27.7% for graduates across all Australian universities.[32]

    E. Following the Wollongong model, a training programme that maximises student clinical exposure in primary care and in rural and provincial settings rather than in a tertiary hospital setting, and takes a "digital first" approach to teaching, including the use of digital anatomy and virtual reality platforms to replace cadaver-based teaching.

38. The WMS proposal presents the opportunity for a substantially different model of medical education to what currently exists in New Zealand.

39. In this section, we describe what competition in medical education would look like in New Zealand with the introduction of a third player like the WMS and the competitive benefits that would likely accrue as a result.

5.2. Benchmarking of medical school size suggests that WMS would not be sub-scale and UoO/UoA medical schools may be approaching diseconomies of scale

40. As a small country, it might be claimed that New Zealand is too small to have a third medical school, and in particular that the third medical school would be below efficient scale and therefore inefficient from a cost perspective.

41. However, as mentioned in section 4, New Zealand has the lowest proportion of medical schools per capita compared to other OECD nations. Benchmarking the proposed size of the Waikato medical school against Australian counterparts and the United States (which has readily available admissions data to allow for comparison) suggests this is not the case. Figures

[32] Cortie et al., "A Comparison Of Rural and Regional Work Locations and Speciality Choices Between Graduates From the University of Wollongong and All Australian Medical Schools Using the Medical Schools Outcomes Database," *Australian Journal of Rural Health* 32, no. 1 (February 2024): 157.

Figure 5.1 and Figure 5.2 below expand on FiguresFigure 4.3 and Figure 4.4 respectively to include American and UK medical schools and also the proposed size of the Waikato medical school.[33]

42. This shows that:

    A. While the University of Waikato would be slightly below average in size compared to American and Australian medical schools, its relative position to other medical schools suggests that Waikato would not be sub-scale.[34] There are many Australian and American medical schools that operate on a smaller scale than the proposed Waikato Medical School would operate at.

    B. In terms of total enrolment, UoO and UoA appear to be larger than all but one medical school in the United States, and only 2 Australian medical schools are larger than the largest New Zealand medical school. This could suggest that the UoA and UoO may be approaching diseconomies of scale if their enrolment is increased further. Diseconomies of scale[35] could manifest as either increased per student costs as the roll expands and/or worse student experience/outcomes if teaching conditions become less optimal.

43. Related to this, with the help of PwC, UoO and UoA, jointly prepared a report arguing that they could expand capacity at a lower cost than the WMS proposal.[36] In this report UoO and UoA argue that they could jointly increase intake by 300 students per year by 2027. If this occurs, then it is possible that UoO and UoA would be larger than any medical school in Australia, the United States or the UK.[37]

44. Note that even setting up a new school with 300 places per year, more than double the size of the proposed Waikato medical school, would be one of the largest schools in our sample and larger than most medical schools in the United States.

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33 Only annual enrolment data was available for UK schools, so they are not shown in Figure 5.1. Additionally, these figures use self-reported data, compared to the values based on caps used in figuresFigure 4.3 and Figure 4.4, as cap data was not available for US and UK medical schools.

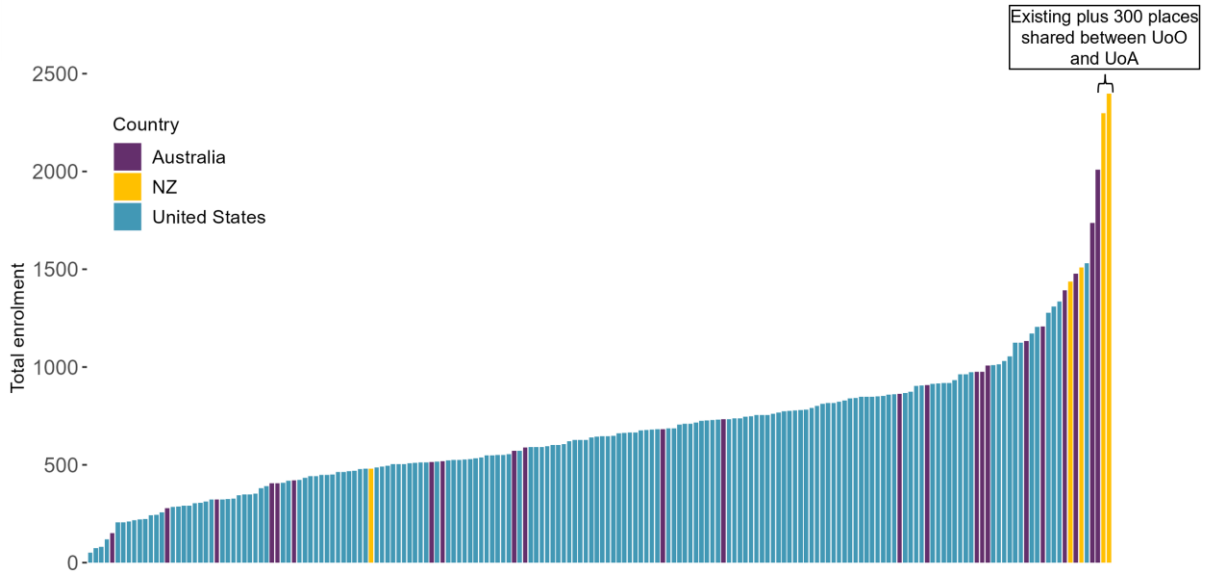
34 Assuming a total enrolment of 480 (120 places * 4 years), the University of Waikato would be in the 25%-50% quantile. The overall average is also slightly skewed, but assuming total enrolment of 480 (120 places * 4 years), the total enrolment of Waikato would still fall under the median of 641.5, and average of 664.5. However, unlike the data from Australian and American medical schools, it should be noted that our total enrolment estimate of 480 students does not include international students and is therefore likely an understatement.

35 This is the economic concept that firms can actually be "too big", in the sense that unit costs actually start to rise once a firm reaches a certain size and inefficiencies from being too large.

36 PwC report on medical education in New Zealand, p. 4.

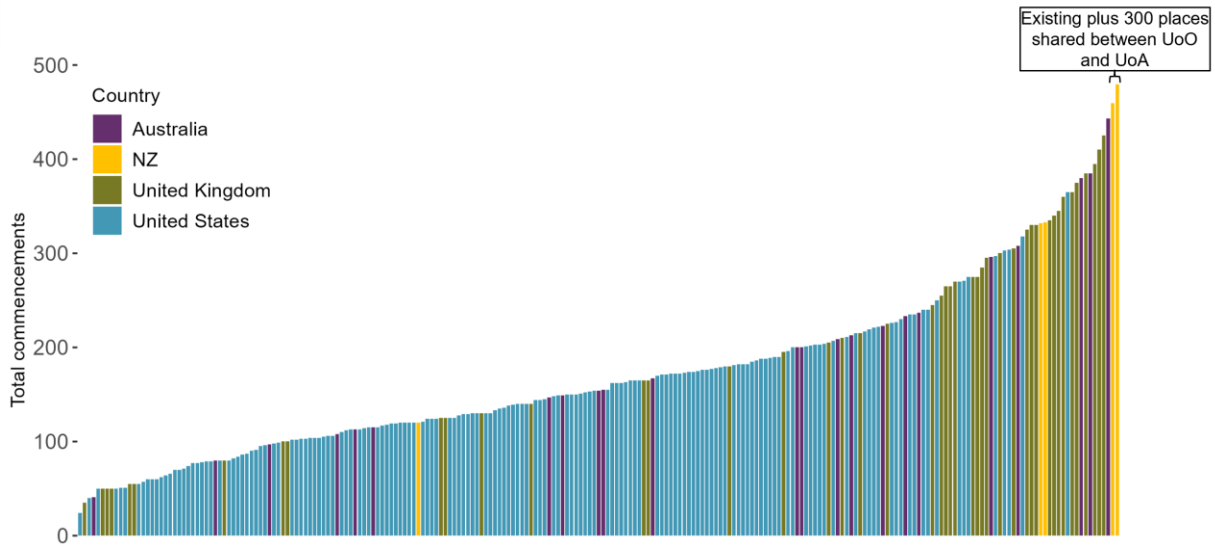
37 We do not have data on total enrolment in UK medical schools, however most UK schools offer 5- or 4-year programmes. Therefore, because annual commencements for UoO and UoA would be larger than any UK school, UoO and UoA would also have greater total enrolment.There are some UK schools that only offer 6-year programs, however, multiplying their annual commencements by 6 still results in lower total enrolment. This also assumes that the medical schools in other countries would not experience a similar growth than UoO or UoA by 2027.UK medical school programme lengths were collected from: https://medicalstudyguide.com/uk-medical-schools.html.

Figure 5.1: Total enrolment in NZ, Australian, and American medical schools and impact of allocating 300 additional places evenly to UoA and UoO



Source: NERA analysis of data from Medical Deans Australia and New Zealand, Association of American Medical Colleges & PwC report on medical education in New Zealand.
Notes: Self-reported enrolment data for 2024 was used for all observations except for when 300 places are added to the cap between UoO and UoA. For these two observations, total enrolment is calculated by taking each school's cap for entrants (as reported in the PwC report), plus the 300 additional places split evenly between the two schools (so the total across both schools is 889 proposed places per year, plus international students). This value is then multiplied by the duration of the degree. It should be noted that the observations for UoO and UoA, which include the additional 300 places, would only come into effect in 2027 and therefore this assumes that the number of international students remains the same, and any direct comparison with other observations assumes no changes in the size of the other schools. Both cap and self-reported data includes international and domestic full fee places.

Figure 5.2: Annual commencements in NZ, Australian, American, and UK medical schools and impact of allocating 300 additional places evenly to UoA and UoO



Source: NERA analysis of data from Medical Deans Australia and New Zealand, Association of American Medical Colleges & UK Office for Students & PwC report on medical education in New Zealand.
Notes: Self-reported commencement data for 2024 was used for all observations except for when 300 places were added to the cap between UoO and UoA. These two observations are constructed in the same way as per Figure 5.1.

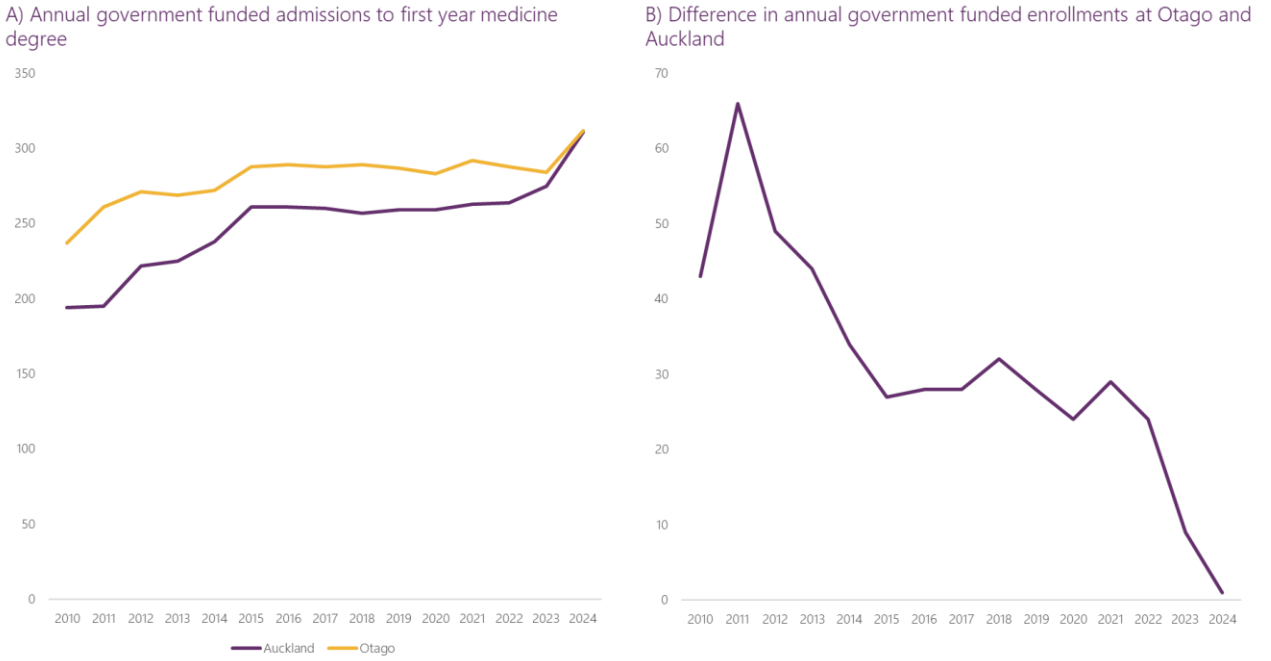
5.3. Competition would likely introduce contestability and competition for funding

5.3.1. The current allocation model does not appear to have any competitive tension

45. At present, medical school funding is allocated to UoA and UoO through the TEC after decisions are made by the government to expand funding. As discussed in section 3.2, at present the schools are usually given the opportunity to jointly propose a split in the increase in the number of students between themselves.

46. The fact that at present UoO and UoA agree a split amongst themselves suggests there is limited competitive tension in the allocation process. This is evidenced by the fact that over time, the allocations appear to have been done in a way to let UoA "catch up," as shown in Figure 5.3 below. This shows that while historically UoO had a larger annual enrolment than UoA, over time this gap has shrunk and essentially been eliminated, with UoA and UoO enrolling 311 and 312 students in 2024 (we note this differs from their funding caps of 312 and 302 respectively, which have similarly grown closer over time, with UoA getting 15 places in the 2025 and 30 of the 50 places in 2024). If the process was competitive, this could be considered evidence that UoA has been outcompeting UoO. However, in the context of a process where Auckland and Otago agree a split between them, the same conclusion is much less likely.

Figure 5.3: The allocation of government funded places has resulted in a symmetric allocation



Source: NERA analysis of data from Medical Deans Australia and New Zealand.
Notes: This is data based on actual commencements and thus may differ from the caps.

47. Competition authorities such as the ACCC and the Commerce Commission are often concerned about mergers involving "vigorous and effective and competitors" or "mavericks." For example, the ACCC notes in its merger guidelines:[38]

> *Vigorous and effective competitors may drive significant aspects of competition, such as pricing, innovation or product development, even though their own market share may be modest. These firms tend to be less predictable in their behaviour and deliver benefits to consumers beyond their own immediate supply, by forcing other market participants to deliver better and cheaper products. They also tend to undermine attempts to coordinate the exercise of market power.*

48. The corollary is that introducing a maverick or disruptive competitor is likely to substantially improve competitive tension. In this regard, WMS would be incentivised to compete aggressively for any future increases in funding and it would be difficult for it to anticompetitively co-ordinate on funding allocations with the existing schools because:

    A. It would be much smaller than the existing schools and therefore incentivised to grow.[39] This also means market shares would be asymmetric, something the economics literature suggests would make co-ordination difficult;[40]

    B. As a lower cost producer of medical graduates via its 4-year graduate entry programme it offers government the option to expand the output of medical graduates at lower cost;[41] and

    C. It has a different business model and cost structure for the production of medical graduates.[42] The economics literature suggests would make co-ordination difficult.[43,44]

    D. More generally, the introduction of a third player would increase the transaction costs of coordination.

49. With multiple schools that could potentially supply increased government funded places, the TEC is likely to be more able to set up an allocation process that encourages competition, compared to a situation when it is faced with a symmetric duopoly. A competitive tendering process is unlikely to materially increase costs for the TEC given the information revelation that would occur through this process.

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38 ACCC, Merger Guidelines, November 2017, para. 7.56

39 In the context of capped funding for medical school places, this would manifest as competing hard to get a large share of any new places that are allocated.

40 Garrod, L. & M. Olczak, "Explicit vs tacit collusion: The effects of firm numbers and asymmetries", *International Journal of Industrial Organization* 56 (January 2018): pp. 1-25.

41 Assuming per year government funding and tuition rates are the same as those currently in place at UoA and UoO, the University of Waikato will be lower cost by offering a shorter 4-year programme.

42 E.g. WMS differs from the existing schools through its shorter program, focus on primary placements and "digital first" approach.

43 Specifically, firms with different business models and cost structures would find it difficult to agree on a focal price, since the efficient price for each firm would differ.

44 Ivaldi et al., "The Economics of Tacit Collusion: Implications for Merger Control", *Contributions to Economic Analysis* 282 (2007): 217-239. The NZCC merger guidelines also list symmetrical cost structures as a market feature that may facilitate coordinated conduct. NZCC, Mergers and acquisitions guidelines, May 2022, para. 3.89.

50. Similarly, the universities may make direct bids to the government when it is considering expanding places, which is essentially what is presently happening through the process of considering whether to introduce the medical school at the University of Waikato.

5.3.2. Contestability for funding could lead to efficiencies and price competition

51. As already discussed in section 4, the government and students pay more for medical schooling per year in New Zealand than in Australia, with the difference being $17,859 per year.[45] To the extent this difference would be eroded by competition (which it may not entirely if there are other explanations for the higher expenditure per student in New Zealand compared to Australia), the "size of the prize" for closing the gap is $10,965,162 per year, given there are 614 government-funded medical school places each year in New Zealand as of 2025.[46] In present value terms, using Sapere's period of 46 years, this is $175,669,087.[47] While there is no direct mechanism to achieve this currently given the way that student funding rates are set, with a third player the government could presumably seek competitive bids to train medical students.

52. Since it's unlikely that the difference would be fully eroded by the introduction of a third medical school, a more modest gain might be a saving of 1-5% on the fees that the New Zealand government and students pay for medical school per year. This range is consistent with the range of productive inefficiencies the Commerce Commission has considered in merger authorisations.[48] It is thus a reasonable range for considering the productivity gains that might result from introducing a third university into a duopoly structure. Using this range results in savings of $435,940 – $2,179,700 per year.[49] In present value terms, this is $6,984,045 – $34,920,224.[50]

53. While a cost saving is a benefit in and of itself, it is important to recognise the shortage of doctors and fiscal constraints on medical student training that currently exists. A much more important benefit is therefore that if the cost to the taxpayer and students fell, this would allow

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45 The average total of government funding and student fees at UoA and UoO is $71,000. The same figure for publicly funded universities in Australia is $46,578 AUD, which is $53,141 NZD using a long run exchange rate (January 1999 to February 2025). The long run rate results in a more conservative value for the difference of $17,859 between Australian and New Zealand medical school costs than the current spot rates.

46 This value is calculated by multiplying the number of government-funded medical school places by the difference between the average total of government funding and student fees between Australia and New Zealand, or 614 multiplied by $17,859. From 2026, the number of funded places will increase by an additional 25 students across UOA and UOO increasing the "size of the prize" from $10,965,162 to $11,411,626, which is $182,821,737 in present value terms. This is $7,152,650 greater than the 2025 present value.

47 Present values were calculated using Sapere's economic analysis time frame of FY2026 to FY2072, or 46 years, and a discount rate of 5% as used in their CBA of the Waikato medical school. We include the savings in our calculation once all options are operational in FY2028, so we assume $0 savings for FY2026-2027 when calculating present values.

48 For example, see: NZCC, Southern Cross Hospitals Ltd and Aorangi Hospital Ltd Decision 729, July 2011, para 148; NZCC, Public Decision 725 Cavalier Wool Holdings New Zealand Wool Services, June 2011, para. 271.

49 The lower estimate value is calculated by taking 1% of the cost of training a medical student in New Zealand, which is $71,000 as discussed in footnote 45, and multiplying it by the total number of medical school places in 2025, which is 614. The upper estimate value is calculated using the same method but 5% instead of 1%.

50 The present values are calculated using the same method as the one described in footnote 4947.

more medical students to be trained for the same total expenditure. In effect, efficiency gains ease the fiscal constraint that exists for the number of medical students.

54. Viewing the benefits this way, we can quantify the benefit as the number of additional medical student places that could be funded for the same outlay:

    A. A saving of 1% in the required funding per student would result in 6 extra students each year.[51] Extrapolating the monetised benefit values of additional GPs[52] as a result of funding more medical school places from Sapere's cost-benefit analysis, the value of the additional medical students nationwide is between $62,824,758 to $123,654,324 discounted to present value terms.[53]

    B. If the saving was instead 5%, this would result in an additional 32 students each year. Applying the same methodology would result in an NPV benefit of $335,065,324 to $659,492,521.

5.4. Competition would lead to better targeting of government funding and a more diverse student base

55. Competition amongst the universities for government funding would likely lead towards better targeting of government funding to achieve the outcomes desired in the medical workforce.

56. The recent Australian example (discussed above at [31]) of the government seeking proposals for expanding the medical workforce in rural areas is an example of this. Indeed, the premise of the WMS is it would be better at delivering rural GPs by restricting on campus training to Year 1 of the programme and focusing on placing students in extended rural clinical settings, such as regional hospitals and rural GP clinics, for Years 2-4.

57. Research shows that relative to metropolitan medical schools, rural medical programmes are more likely to attract students of a rural background, and these students are more likely to practice medicine in rural regions after graduating. Research also shows medical students from a metropolitan background who train in a rural setting for an extended period are also more likely to remain in rural regions and practice medicine after graduating.[54]

58. This is essentially what the Sapere CBA has quantified – that the WMS would get more rural GPs sooner due to a shorter medical training programme that features extended rural clinical placements relative to the alternatives, so we have not attempted any additional quantification on this point.

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51 This is calculated by taking the $435,940 total annual saving and dividing it by the assumed lower funding cost of a student of $70,290.

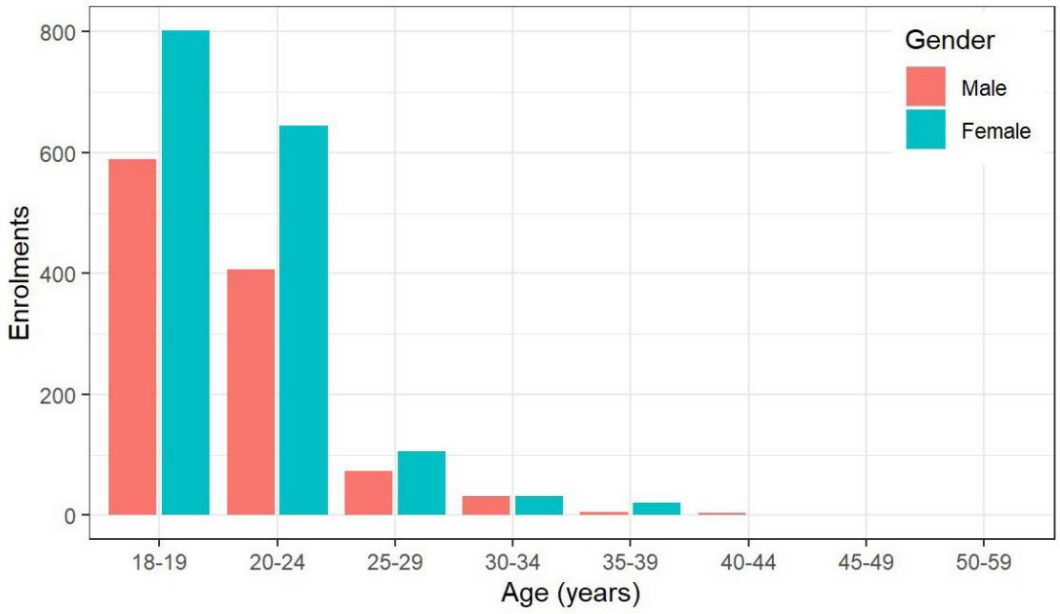
52 Note that we only include the benefit of additional GPs for consistency with the Sapere calculations. The benefits would be larger if the value of students who become specialists is also included.

53 The benefits are counted from 2036 when the first additional doctors are assumed to enter the workforce. The estimates are conservative as Sapere calculates the monetised benefits with respect to additional GPs rather than all doctors that enter the workforce. See Appendix A for the calculation details.

54 Seal et al., "Influence Of Rural Clinical School Experience and Rural Origin On Practising in Rural Communities Five and Eight Years After Graduation," *Medical Journal of Australia* 216, no. 11 (June 2022): 572.

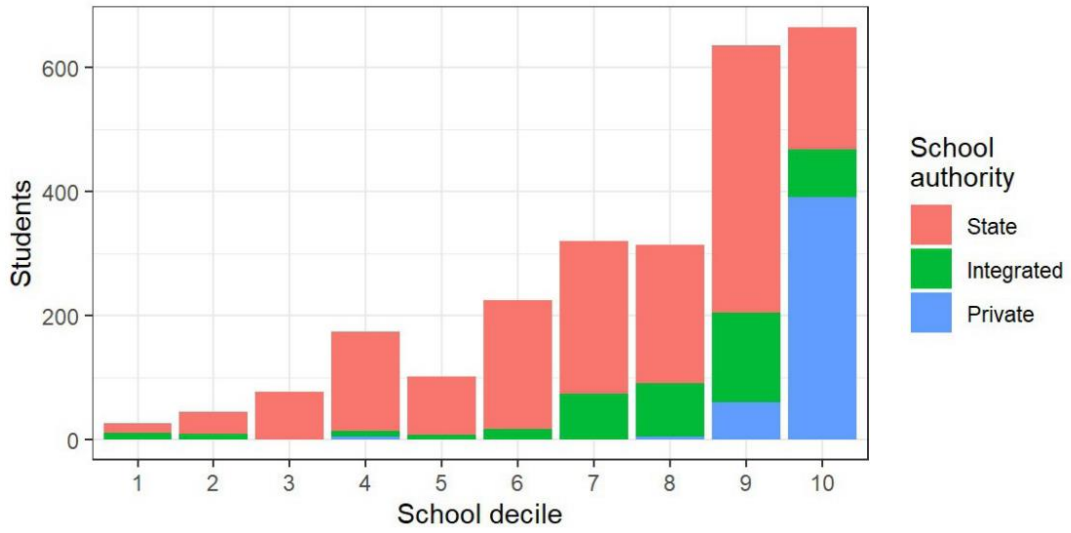
59. In this regard, the current model whereby the majority of students are those that have performed well in first year health sciences appears to be skewing the student base towards high school students from wealthy schools, as shown in Figures Figure 5.4 and Figure 5.5.

Figure 5.4: Enrolments by age and gender



Source: Bagg, W. et al. "Socio-demographic profile of medical students in Aotearoa, New Zealand (2016–2020): a nationwide cross-sectional study", *BMJ Open* 13, e073996 (2023), p. 4.
Notes: The data in figure is made up of New Zealand citizens and permanent residents, between 2016 and 2020.

Figure 5.5: Enrolments by school decile and authority



Source: Bagg, W. et al. "Socio-demographic profile of medical students in Aotearoa, New Zealand (2016–2020): a nationwide cross-sectional study", *BMJ Open* 13, e073996 (2023), p. 4.
Notes: The data in figure is made up of New Zealand citizens and permanent residents, between 2016 and 2020.

60. The graduate entry model that would be adopted by WMS seems more likely to attract a broader cross section of students, including those that have studied something unrelated to medicine and have work experience in other areas, but later in life decided they would like to be a doctor. In particular, even under the current graduate entry model, UoA/UoO students must have completed their undergraduate degree no more than 3 years prior to applying in the case of UoO[55] and 5 years prior in the case of UoA.[56] This seems likely to rule out this type of applicant.

5.5. WMS would introduce a differentiated product, increasing competition for students and lowering costs

61. At present, both of New Zealand's medical schools offer their students the same qualification: the Bachelor of Medicine and Bachelor of Surgery (MBChB). Students gain entry into the 5-year MBChB following either a first-year competitive entry program or after completing an undergraduate degree.

62. Unlike the 5-year medical degree at UoA/UoO, the WMS would offer a 4-year postgraduate medical qualification. Similar to existing postgraduate medical programs offered in Australia, applicants to the WMS will be students who have already completed a previous undergraduate degree. This undergraduate degree could be in any subject and, unlike the UoO and UoA programs, students would not be required take first year health science papers prior to starting their medicine degree if they did not take those papers as part of their undergraduate degree.[57]

63. A 4-year postgraduate medical degree would be welfare enhancing for admitted postgraduate students who can become qualified doctors one year earlier than if they followed the graduate entry path to the undergraduate programs at UoA or UoO (or two years in the case of someone without an undergraduate science degree). It would also be welfare enhancing for society as a whole if doctors are able to enter the workforce one year earlier than they would otherwise.[58]

64. Furthermore, the introduction of this differentiated degree program may elicit a competitive response from UoO and UoA, for whom approximately 30% of medical students are post-

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55 "Medicine: Guidelines for Admission", University of Otago, accessed March 21, 2025, https://www.otago.ac.nz/healthsciences/students/professional/medicine.

56 "Bachelor of Medicine and Bachelor of Surgery", University of Auckland, March 21, 2025, https://www.auckland.ac.nz/en/study/study-options/find-a-study-option/bachelor-of-medicine-and-bachelor-of-surgery-mbchb.html.

57 For example, the graduate entry criteria on the UoO website states *"Applicants who are offered a place in second-year Medicine, and are missing the First-Year papers (or their equivalent) listed in the MB ChB Schedule, will be required to undertake a prescribed course of study."* And the UoA graduate entry website states: "*Depending on your previous study, you may need to undertake some or all of the First Year courses before commencing Part II."* See https://www.otago.ac.nz/healthsciences/students/professional/medicine#graduate and https://www.auckland.ac.nz/en/study/study-options/find-a-study-option/bachelor-of-medicine-and-bachelor-of-surgery-mbchb.html

58 While the cumulative time at university would be longer for a student whose chosen path is to do an undergraduate degree and then immediately enrol in the WMS postgraduate degree, for students who already have an undergraduate degree, the time taken is less than if they enrolled in the undergraduate degree at UoO/UoA.

graduates.[59] If UoO and UoA introduced post-graduate programmes in response to the WMS entering and at the current funding and fee rates, this would result in a saving to students and tax payers of $71,000 per medical student (being the combined taxpayer and medical student funding for a year of medical school). With approximately 30% of medical students in the status quo being graduates, this would amount to a saving of $13,078,200 per cohort of medical students.[60]

65. While this is a direct saving and should be considered a benefit in and of itself, as noted in section 5.3.2 above, given the cap on the funding of medical students and shortage of doctors, the primary benefit of this saving is the value created through training more medical students for the same outlay. If this saving is used to fund additional medical school places at the current funding and fee rates, then it would result in between 39 and 46 more medical places funded per year.[61]

66. Using the monetised benefit values from Sapere's cost-benefit analysis, the value of the additional medical places nationwide is between $408.4 million to $948 million discounted to present value terms as at 2026.

5.6. Dynamic efficiency could lead to large downstream benefits

67. Developments in digital health technologies has placed healthcare in a state of dynamic technical change. For example, the adoption and utilisation of digital wearable devices (such as glucose monitoring systems), electronic health records, and telemedicine for remote clinical services has increased significantly in recent years.[62]

68. Introducing a third medical school into a concentrated duopoly structure at this time of change is likely to lead to more innovation in medical education. Innovation in the medical education market is likely to lead to better outcomes for patients in downstream markets. In this regard, the WMS proposal is for a "digital first" approach, which we understand is a different approach to that taken by UoO/UoA.

69. For example, WMS intends to use virtual reality tools and digital anatomy tables, which are already established in Australian universities, that can lead to efficiencies in several ways. Firstly, these tools would replace the need for a mortuary and a human tissue license in the WMS leading to significant operational savings. Secondly, medical students using these tools would likely have a more hands-on experience when studying anatomy and dissection, compared to

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[59] To calculate the proportion of graduate entry students we use the midpoint between two estimates as a reasonable approximation. The upper estimate of 32% is in a Ministry of Health Aide-Mémoire that compares the three investment options for medical education (H2024048432). The lower estimate of 28% we calculated from cohort numbers for 2020-2024 provided in the PwC report commissioned by UoA and UoO. We use these upper and lower estimates as they are based on values in more recent years relative to the range noted at [23.ii].

[60] This is calculated by multiplying the cap of students by 30% to get an estimate of 184 postgraduate students. This is then multiplied by the $71,000 saving per postgraduate student to get total savings per cohort.

[61] This was estimated by dividing the $13 million in savings by the average cost of the additional degrees. This range depends on the proportion of postgraduates that make up the additional places. The lower estimate assumes that postgrads make up 30% of additional places, while the upper bound assumes postgrads make up 100% of the additional places.

[62] Borges do Nascimento et al., "Barriers and Facilitators to Utilizing Digital Health Technologies By Healthcare Professionals," *npj Digital Medicine* 6, no. 161 (September 2023): p. 1.

groups of students working on, or watching an instructor working on, a cadaver. Finally, integrating digital technology into training has been shown to increase educational standards, reduce personal and psychological barriers associated with digital technology adoption, and lead to better patient outcomes.[63]

70. Our emphasis on the WMS approach is not to say that one approach to medical education is necessarily better than the other, but rather that it appears to be different from the status quo. The point being that having multiple, differentiated bets on the approach to medical education is likely to lead to better long run outcomes for patients in the downstream markets.

71. Since it is difficult to quantify dynamic efficiency gains, the NZCC typically looks at a percentage of total sales revenue that is gained/lost as an estimate.[64] Revenue is used as while dynamic efficiency and innovation can result in cost savings, it can also result in increased quality and new products. Thus a value, rather than cost based measure is appropriate. We approximate the size of the of the downstream market using GP salaries as a proxy for total spending on GP services. The calculation generates a conservative estimate because it is cost rather revenue based and does not include all costs associated with running a GP practice.

72. Using annual salaries per FTE and estimating the total registered FTE GPs, we estimate the total spending on GP salaries per year.[65] This value is then multiplied by 0.5% and 1%, based on the ranges from previous NZCC authorisations, to get a range of the annual dynamic efficiency gains.[66] We estimate this range to be between $4,439,900 and $8,879,800. In present value terms, the expected benefits are between $41,964,199 and $83,928,398.[67]

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63 Marvaso et al., "Virtual and Augmented Reality As a Novel Opportunity to Unleash the Power Of Radiotherapy In the Digital Era: A Scoping Review," *Applied Sciences 12*¸ no. 22 (2022): 11308.

64 For example, see: NZCC, NZCC 31 Cavalier Wool Holdings and NZ Wool Services – Authorisation determination, November 2015, para. 565; NZCC, NZCC 8 NZME Limited and Fairfax NZ Limited – Authorisation determination, May, 2017, para. 1229.

65 Annual salary per FTE was taken from: Te Whatu Ora Senior Medical and Dental Officers Collective Agreement, Association of Salaried Medical Specialists, 2023, p.8. The total number of registered FTE GPs was estimated using the number of registered doctors as reported in: "Our data: Vocational", Medical Council of New Zealand, accessed 13 March, 2025, https://www.mcnz.org.nz/about-us/our-data/new-registrations-vocational/. This value was then scaled by the estimated FTE to head count ratio of 82.2% as found in: Allen + Clarke, 2021 GP Future Workforce Requirements Report, October 2021, p.6. This paper does not provide specific ratio for each year, and therefore, to be conservative, the lowest value is used (which was a forecast for 2031).

66 For example, see: NZCC, NZCC 31 Cavalier Wool Holdings and NZ Wool Services – Authorisation determination, November 2015, para. 564; NZCC, NZCC 8 NZME Limited and Fairfax NZ Limited – Authorisation determination, May, 2017, para. 1226.

67 The present value is calculated using the time frame of 2026-2072 as used in Sapere's CBA (see page 8). The annual benefits start from 2036 when the first GPs enter the workforce and go until 2072. We assume a ramp up period between 2036 and 2042, using the yearly GP FTE increases from Table 7 in Sapere's CBA to scale the gains. We also use the 5% discount rate used in Sapere's analysis. All values are then calculated in present value terms for 2026.

5.7. Summary of quantified benefits

Table 2: Summary of quantified benefits

Benefit	Direct Value of Savings	Additional medical places per year from savings	Value of additional medical places to New Zealand
Lower fees required to train medical students due to increased competition	$7 million - $34.9 million	6-32	$335 million - $659.5 million
Shorter programme duration for graduate medical students	$13.1m per cohort.	39-46	$408.4 million - $948 million
Dynamic efficiency benefits	$42 million - $83.9 million	-	-

Appendix A. Extrapolation of Sapere benefits calculation

73. Sapere estimates that adding 120 new entrants from FY2026 produces an additional 131-258 GP FTEs by 2042 relative to the status quo. The range depends on which of the three investment options the government pursues. Option one produces the least number of additional GPs while option three produces the most.

74. The number of additional GP FTEs by 2042 is not the same as the number of new entrants. This is because not all medical graduates choose to become GPs – some might choose to become specialist or move to a different country. This estimate only shows the number of additional GPE FTEs produced by 2042 if 120 new medical students are added every year starting from FY2026.

75. Using the additional GP FTEs in the workforce through to 2042, Sapere estimates the reduced population mortality benefits of the additional GPs for the period 2036 (when the first additional GPs enter the workforce), through to 2072 (a period that should be sufficient to capture the majority of the benefits) nationwide and rounded to the nearest hundred, and discounted to present value terms as:

    A. 19,200 life-years saved under option one, which produces 131 GP FTEs

    B. 30,100 life-years saved under option two, which produces 206 GP FTEs

    C. 37,700 life-years saved under option three, which produces 258 GP FTEs

76. Sapere monetises life years using the value of a statistical life and calculates the present value monetised benefits to be:

    A. $1.26 billion under option one

    B. $1.98 billion under option two

    C. $2.48 billion under option three

Monetised benefits per additional GP FTE

77. Using Sapere's values, an additional GP FTE results in nationwide present value monetised benefits as at 2036 of approximately $9.61 million.

    A. Option one gives $9,618,321 (calculated by dividing the $1.26 billion of PV monetised benefits from option one by the 131 additional GP FTEs produced by option one and rounded to the nearest dollar).

    B. Option two gives $9,611,650 (calculated by dividing the $1.98 billion of PV monetised benefits from option two by the 206 additional GP FTEs produced by option two and rounded to the nearest dollar).

    C. Option three gives $9,612,403 (calculated by dividing the $2.48 billion of PV monetised benefits from option three by the 258 additional GP FTEs produced by option three and rounded to the nearest dollar).

78. While our analysis takes into consideration the cost of training medical students at a New Zealand university (as the benefits we quantify are funding additional places through efficiency gains), these values do not account for the medical trainee intern grant. This is a one-time

government payment of $26,756 per medical student as a part of their six year of study. Subtracting this grant from the values above (which overstates the present value cost and therefore is conservative) yields a nationwide present value monetised benefit per additional GP FTE for each option of:

A. Option one gives $9,591,565 (calculated by subtracting $26,756 from $9,618,321).

B. Option two gives $9,584,894 (calculated by subtracting $26,756 from $9,611,650).

C. Option three gives $9,585,647 (calculated by subtracting $26,756 from $9,612,403).

Ratio of additional GP FTEs to new medical students

79. Using Sapere's values, one additional medical student added in FY2028 results in:

    A. At least 1.09 additional GP FTEs by 2042 (calculated by dividing the 131 additional GP FTEs from option one by the 120 new funded places).

    B. At most 2.15 additional GP FTEs by 2042, (calculated by dividing the 258 additional GP FTEs from option three by the 120 new funded places).

80. That is, if the number of medical places increases by 1 in FY 2028, which is when each investment option becomes operational according to Sapere, then of all the extra doctors that would enter the workforce by 2042 from this increase, between 1.09 to 2.15 would be GP FTEs.

Monetised benefits per one new medical student

81. Each additional medical student generates $10.47 – $20.61 million in nationwide present value monetised benefits as at 2036.

    A. The lower bound is calculated by multiplying $9,591,565 million of PV monetised benefit per GP FTE from option one by the 1.09 additional GP FTEs entering the workforce by 2042 per one additional medical student added in FY2026 in option one.

    B. The upper bound is calculated by multiplying $9,585,647 million of PV monetised benefit per GP FTE from option three by the 2.15 additional GP FTEs entering the workforce by 2042 per one additional medical student added in FY2026 in option three.

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