



THE FUTURE OF HEALTHCARE PROFESSIONAL EDUCATION

Working Group Report

Proposed Guiding Principles for Future Healthcare Professional Education

DRAFT PRINCIPLE THREE

'Any change to education must enhance the participation and ultimately graduation of Māori and Pasifika people in health professional education. This means that any consideration of proposed change has an equity lens applied as a first principle. To avoid doubt, no change to the delivery of healthcare professional education should create further barriers for Māori and Pasifika people'

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LIST OF ABBREVIATIONS USED

AHPRA	Australian Health Practitioners Regulation Agency	MD	Medical Doctor
AI	Artificial Intelligence	MMI	Multiple mini interviews
ATAR	Australian Tertiary Admissions Rank	MNSci	Master Nursing Science
AUT	Auckland University of Technology	MPharm	Master of Pharmacy
BMedHSc	Bachelor Medical & Health Sciences	MPJE	Multi-State Pharmacy Jurisprudence Exam
Bnurs	Bachelor of Nursing	NAPLEX	North American Pharmacist Licensing Exam
BHSc	Bachelor of Health Sciences	OBA	Optometry Board of Australia
BOptom	Bachelor of Optometry	OCANZ	Optometry Council of Australia and New Zealand
CAPEX	Capital Expenditure	OD	Doctor Optometry
CertHealthSci	Certificate in Health Science	ODOB	Optometrists and Dispensing Opticians Board
CCAPP	Canadian Council for Accreditation of Pharmacy Programs	OLY1	Overlapping Year One
DHB	District Health Board	PG	Postgraduate
DPT	Doctor Physiotherapy	PharmD	Doctor of Pharmacy
FMHS	Faculty of Medical & Health Sciences	RRAS	Regional and Rural Admission Scheme
FoS	Faculty of Science	SAC	Student Achievement Component
GAMSAT	Graduate Medical School Admissions Test	SBS	School of Biological Sciences
GMC	General Medical Council	SES	Socioeconomic Status
GPA	Grade Point Average	TEC	Tertiary Education Commission
GPhC	General Pharmaceutical Council	UCAT	University Clinical Aptitude Test
Hons	Honours	UG	Undergraduate
HPE	Healthcare professional education	UK	United Kingdom
ITP	Institutes of Technology & Polytechnics	UoA	University of Auckland
ITP	Intern Training Program	UN	United Nations
MAPAS	Māori and Pasifika Admissions Scheme	USA	United States of America
MBBS	Bachelor of Medicine, Bachelor of Surgery	UTAS	Undergraduate Targeted Admissions Scheme
MCNZ	Medical Council of New Zealand		

1 Foreward

The health workforce, with an estimated 80,000 employees is our country's single largest employer. Unsurprisingly, Health (capital H encapsulating all health disciplines) attracts many students to Waipapa Taumata Rau each year, with a career in medicine the major drawcard. The requirements for an effective Health practitioner across the many disciplines have evolved, and it is time to consider whether our education pathways in Health are fit-for-purpose and meet the new ambitions of the university strategic plan *Taumata teitei*. One of the challenges of *Taumata teitei* is how best to accommodate new concepts and learning now deemed to be essential in a competent work-ready Health graduate. Our Health curriculum has remains constrained by a degree structure and student pathways that have changed little since their establishment 25 years ago. Since that time, Schools of Pharmacy, Nursing and Optometry have been established, and new programmes in areas such as medical imaging, nutrition and dietetics and physiotherapy have been established. In medicine, we have moved towards graduate entry into medicine (48% in 2021) and a significant expansion of our Māori and Pacific student cohorts.

Our faculty's mission is to produce competent Health graduates for tomorrow, ensuring that they are knowledgeable, skilled, and ethical and are deeply cognisant of and sensitive to the complex natural and societal challenges of tomorrow's world. Vastly different tools and alternative approaches require new competencies that are not part of our current curriculum. Climate change, sustainable practices, Hauora and matauranga Māori, equity, advanced technologies, digital science, artificial intelligence and complex systems analysis, understanding data governance and sovereignty, changing scopes of practice and inter and transdisciplinary activities are areas we acknowledge are significant, but to which we are challenged to apply to our existing curricula.

A school student coming to Waipapa Taumata Rau considering a career in Health, is immediately confronted with a difficult choice of two parallel non-intersecting degrees; the BSc Biomed or the BHSc, which contribute to the common overlapping year 1 (OLY1) but then go in quite separate directions. Little has changed in OLY1 since its inception and students regularly report that this is a difficult and confusing first year at university. A recent medical graduate told me "... that was the worst year of my life!". This is not an uncommon sentiment.

After 25 years, it is time to consider alternative approaches that provide a more nurturing student experience with clearer pathways to Health specialties and innovative learning strategies that foresee new challenges. Many universities have already made a transition to a generalist undergraduate learning feeding into a range of specialised post-graduate professional training programmes. Almost all Australian universities (led by the landmark Melbourne model) now offer a 3- or 4-year postgraduate MD following a general undergraduate degree.

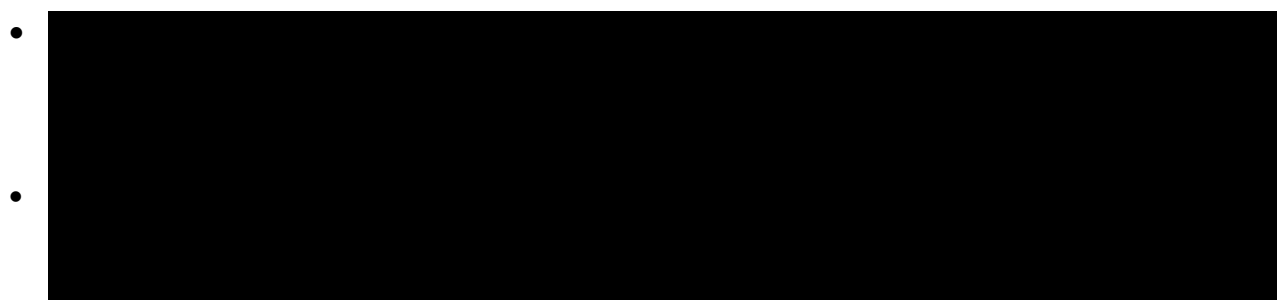
In 2021, I asked Professor Warwick Bagg, Deputy Dean to chair a faculty working group to consider the pros and cons of moving to postgraduate professional Health degrees and the subsequent development of a revised undergraduate degree that incorporates more of what we believe all Health students need to learn. This document is the work of many, but I especially thank Warwick and Janice Mueller of Waipiata Consulting for the intensive work required in conducting research, consulting with Australian colleagues, collating the findings and compiling this concise report. I hope that this document will be read in the spirit it is intended and forms the foundation for a wider consultation process around the Health curriculum for Waipapa Taumata Rau.

Prof John Fraser
Dean, FMHS

2 Scoping Review Findings

In summary, this scoping review has concluded that:

- There is significant FMHS desire to update the health curriculum to prepare graduates for 2030 and beyond
- Consequently, the FMHS will need to engage in the development of a new transdisciplinary undergraduate health degree, considering the outcomes of the UoA curriculum transformation project and that this degree replaces the BHSc
- The FMHS develops detailed plans for graduate entry health professional programmes and other postgraduate offerings within the broad scope of health to determine the size, shape, and composition of the suite of opportunities
- That the unique and flexible educational offerings developed offset any potential loss of school-leaving students choosing an alternative university
- The FMHS engages with Māori and Pasifika whānau and communities to ensure that changes are beneficial, and any lengthening of learning is offset by educational and employment benefits
- That detailed engagement occurs with the University, and subsequently the Ministry of Health and TEC to align health education and workforce strategy and ensure adequate funding
- Wider community and stakeholder engagement needs to occur to assist in the development of the transdisciplinary health degree
- Detailed work is undertaken to minimise selection competition for capped programmes e.g., medicine



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3 Introduction

Healthcare professional education (HPE) has developed significantly since the early 1900's when the health professions were largely unregulated, few hospitals existed and only in 1910 was the first effective therapeutic agent made available¹. In 1910, Flexner proposed the first major shake-up in medical education, emphasising the importance of the science underpinning medical practice². In 2021, almost every aspect of healthcare is different to what it was in 1910. Traditionally, healthcare education centred on the individual mastery of biomedical knowledge, in much simpler settings and in teams that don't reflect the current complexity, nor working reality of healthcare delivery today³. Multidisciplinary teamwork in complex and uncertain healthcare settings are the norm today. Therefore, modern HPE emphasises the importance of working in teams, lifelong learning, critical thinking and a knowledge of models beyond the biomedical causes of illness.

No discussion on HPE in Aotearoa can be undertaken without first acknowledging that there is significant inequity at every level of society for Māori and Pasifika people as a consequence of racism and colonisation. Inequity impacts adversely on health and social wellbeing culminating in younger onset of complex chronic disease and reduced life expectancy. These inequities must be put to right and the Faculty of Medical & Health Sciences (FMHS) is committed to contributing to solutions through affirmative HPE selection policies, anti-racism education, and considering education policies through an equity lens. Many of the features of modern HPE are already present in the FMHS professional programmes, which are fully accredited by the relevant regulatory authorities and graduates of the faculty are held in high esteem. Nevertheless, the FMHS needs to consider if the HPE models currently in use will continue to serve Aotearoa well in the future.

The core role of health professionals is to provide timely and appropriate patient centred care. How health professionals deliver their role, and in what contexts, continues to evolve over time. Health professionals in Aotearoa stand at a juxtaposition. On the one hand inequity for Māori has continued to increase and may be further exacerbated by current and future global challenges, the most pressing of which is climate change. The delivery of health services is inequitable, with poorer people and rural populations being most affected. On the other hand, rapid advances in medical treatments and devices, the use of data science and artificial intelligence, advances in genetics and a myriad of other developments, all present opportunities, but require cost effective implementation plans. Interprofessional healthcare learning, collaborative practice and Māori clinical and cultural competence / safety for practitioners are increasingly important to enhancing patient safety and improving equity.

In sum, there are ongoing challenges and opportunities for healthcare delivery, and future-proofing healthcare professional learning and assessment, considering both context and content. Inevitably there are financial considerations of any change, but also there is also a 'cost' of maintaining the *status quo*. Therefore, it is timely to consider if the HPE models as currently configured at the FMHS are fit for future purpose.

¹ Moseley GB. The U.S. Health Care Non-system, 1908-2008. *The Virtual mentor* 2008 May 1,;10(5):324-331.

² Flexner A. *Medical education in the United States and Canada*. New York: Carnegie Foundation for the Advancement of Teaching; 1910.

³ Shelton PG, Corral I, Kyle B. Advancements in Undergraduate Medical Education: Meeting the Challenges of an Evolving World of Education, Healthcare, and Technology. *Psychiatric quarterly* 2017 Jun;88(2):225-234.

4 Our Landscape is Changing – The Why?

4.1 Are we Confident we are on Track to Meet the Needs of Health Graduates and Aotearoa in 2030?

Are there unique reasons for the FMHS to change to graduate health (professional) education? To begin to answer this question the FMHS needs to consider changes in the worldwide delivery of education and the implications of Taumata Teitei. In a worldwide context, Wunderman and Thompson have identified the following ‘megatrends’ in education and the implications for the University of Auckland.

Table 1: Megatrends in Education

MEGATREND #1 RENEWED APPRECIATION FOR THE DEEPER MEANING OF EDUCATION	Disruptions to the tertiary year through 2020 forced a deeper appreciation of the true meaning of education and the value of personal growth gained through shared learning.	The University of Auckland is well-placed to capitalise on renewed appreciation for stable, well-run institutions.
MEGATREND #2 REDISCOVERING EDUCATION'S TRUE ROLE - PREPARATION FOR THE UNKNOWN	Awareness of education's true role is growing - from producing graduates for well mapped career paths, towards acquisition of resilience and life navigation skills amid uncertainty. The role of education is now to prepare people for the unknown - not for today.	An opportunity to balance your legacy University of Auckland brand with redefining the intangible benefits education delivers.
MEGATREND #3 RECONNECTING WITH DIVERSE COMMUNITIES	As global horizons retreat with travel restrictions, APAC institutions refocus on local communities and business partners for distinctive brand identity-building opportunities.	An opportunity to promote how you benefit wide-ranging communities with examples of your domestic and international research and business partnerships - through the lens of Waipapa Taumata Rau.
MEGATREND #4 ACCELERATED DIGITILISATION	In response to environmental disruption, educational innovators are accelerating uptake of digital communication and delivery channels to open up new ways of learning.	An opportunity to meet people on the platforms where they are and offer a modern experience that's more impactful than ever before.
MEGATREND #5 SELF-DIRECTED STUDY IS THE NEW FRONTIER	Personalised AI enhanced learning experiences allow students to create unique educational approaches fully tailored to individual abilities and needs.	An opportunity to elevate your online technology and content to support the entire learning experience - future-proofing students for ever-changing realities.

Taumata Teitei – Vision 2030 & Strategic Plan 2025⁴ provides a new context for the University over the coming five to 10 years. Importantly it stresses focus and impact in four priority areas:

- Leading transition to sustainable and abundant ecosystems
- Improving health and wellbeing for all
- Advancing just, cultured, and engaged communities
- Innovating contemporary, secure knowledge systems

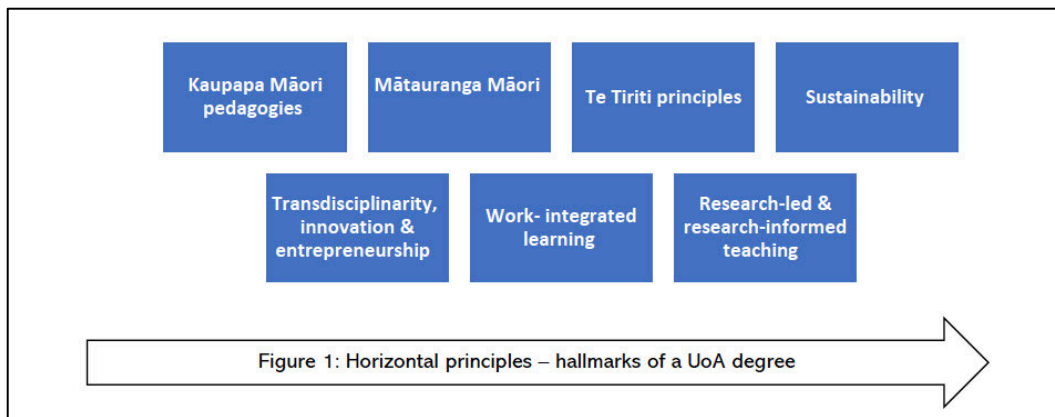
The education priorities of Taumata Teitei are identified as:

- Accessible, equitable lifelong higher education opportunities
- Student-centric learning, co-curricular and extra-curricular cultures
- Education that is research informed, transdisciplinary, relevant and with impact for the world
- Graduates who make the world better tomorrow than it is today

Taking these priorities into consideration the future University of Auckland degree is schematically represented in Figure 1 below.

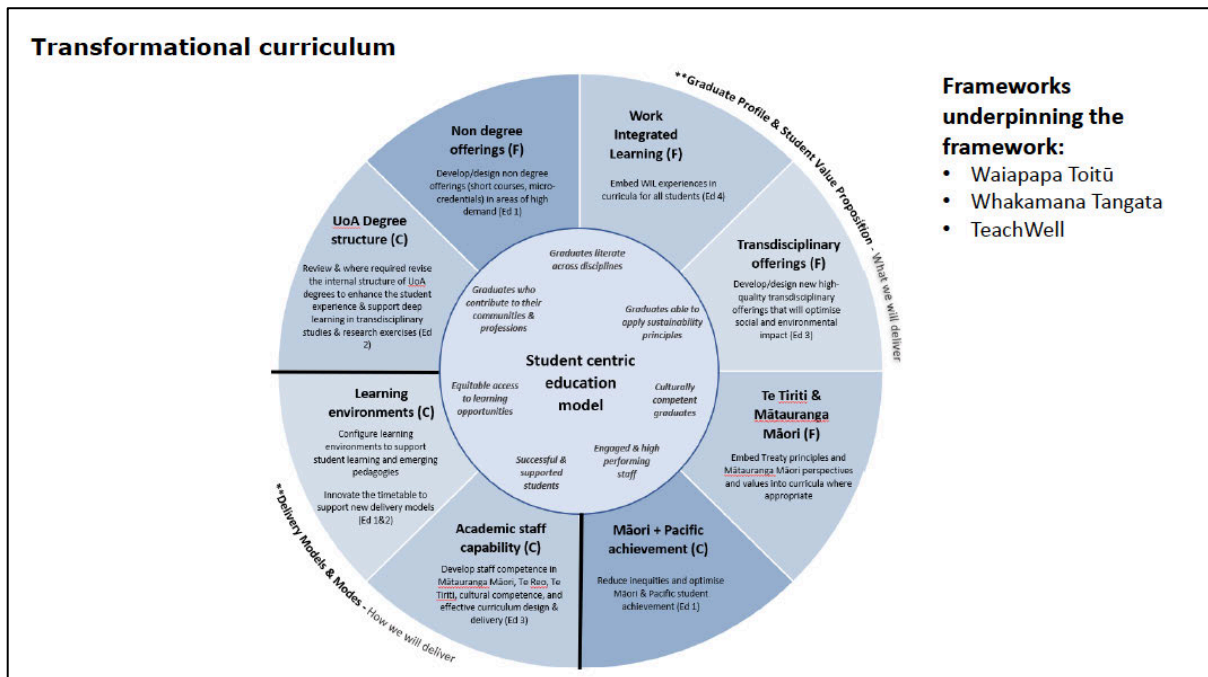
⁴ Available from <https://cdn.auckland.ac.nz/assets/auckland/about-us/the-university/official-publications/strategic-plan/2021-2030/taumata-teitei-vision-2030-and-strategic-plan-2025.pdf> [Accessed 14 September 2021]

Figure 1: The Future University of Auckland Degree



The University wide curriculum transformation work is framework is schematically represented by Figure 2 below.

Figure 2: Transformational Curriculum



Health System Reforms

Major reforms in the health system in Aotearoa also need to inform the delivery of future health care education. The announcement of the establishment of the Māori Health Authority by mid 2022 signals the Government’s intention to improve health outcomes for Māori. While much of the detail of the health reforms has yet to be made public, this generational change invites us to reflect on how the FMHS delivers education. In summary, there are global changes in education, the university is undergoing curriculum transformation and the health sector is undergoing major reform.

4.2 Implications for the FMHS

This working group was specifically asked to consider a change to graduate health professional education. Graduate health professional education is not a new concept. There have been several reasons articulated in the literature as to why graduate health professional education may be a preferred model and these are explored in detail in subsequent sections of this document. While many laudable reasons that have been put forward as potential benefits of graduate health professional education, *there is no overall compelling evidence-based reason in the literature to change to graduate health professional education.*

There are several reasons for the mixed evidence. Most of the evidence relates to medicine and in this context entry to medical programmes is highly competitive, meaning that high achieving students will generally succeed no matter what the educational model. Medical education has undergone a number of revisions over time, but is still a largely apprentice-based education, irrespective of the model of education. The apprenticeship model, to varying degrees, also exists for other health professional education. Given the largely apprenticeship-based education model it may be difficult to demonstrate clear benefits of undergraduate over graduate education. When longer term outcomes are evaluated, graduate entry programmes generally graduate older students, who are more indebted, have more complex lives but don't generally take up different specialities to their undergraduate counterparts.

To shape the graduates of the future will be dependent on the type of students selected, the nature of the educational environment and ethos of the institution. Perhaps the clearest example of this in Australasia is James Cook University. The deliberate selection policy, ethos, curriculum and placements policies increase the likelihood that graduates will work in regional and remote Australia as generalists serving their community.

The FMHS 'why' considers Equity and Sustainability as the foundational concepts for re-design.

4.3 Equity

There are multiple components to equity that need to be addressed. The most pressing of these is ongoing inequity for indigenous Māori. This has been recognised by the Government and the establishment of the Māori Health Authority by mid 2022 signals the Government's intention to improve health outcomes for Māori. In addition, He Puapua, released under the Official Information Act, clearly articulates the changes that need to occur by 2040 in societal political norms to ensure Aotearoa's constitution is rooted in te Titiriti and the UN declaration on the Rights of Indigenous Peoples⁵. Will FMHS graduates be well equipped to work within the reality of the Māori Health Authority and the rangtiratanga-centric approach advocated for in He Puapua?

Pasifika people also suffer significant inequity on every measure, in particular in related to health outcomes. While much of the inequitable health outcomes for Māori and Pasifika may be due to causes beyond that are considered the traditional roles of health professionals, we argue that a bigger picture of HEALTH needs to be considered. Thus the concept of Health, with a 'capital H', needs to be considered in re-imagining of FMHS education. Education is centred on Mataūranga

⁵ Charters C, Kingdon-Bebb K, Olsen T, Ormsby W, Owen E, Pryor J, et al. He Puapua. 2019 November.

Māori, embodies all of human health including health policy which decolonises health education and is antiracist. ‘Capital H’ health education includes health professional education that is research led and evidence based and produces culturally safe practitioners. Recognition that the ‘capital H’ health education incorporates emerging technologies delivered by a wide range of professionals including biomedical scientists, advanced physiologists, genomic experts and others who understand that at the heart of healthcare delivery is equity. We argue that these outcomes can be best achieved by a broad undergraduate ‘capital H’ education, prior to entry to health professional education and other ‘capital H’ health disciplines.

4.4 Workforce Equity

There continues to be significant underrepresentation of Māori and Pasifika people in every part of the health workforce. The FMHS has invested significantly over several decades to improve access and entry of Māori and Pasifika to and graduation from health professional degrees. This has been especially successful for medicine, but less successful for other aspects of ‘capital H’ health education. While the reasons for the mixed success are multifactorial, one factor is the difficulty for prospective students to grasp the full range of ‘capital H’ health professions available to peruse as a career. This is a challenge faced by all prospective students and is an argument for graduate entry after a broad ‘capital H’ degree to be given the opportunity to see the multiplicity of pathways that are open to them to participate in the health workforce.

There is also a duty for the FMHS to ensure that students are educated in culturally safe practices. This has also been recognised in legislation at an individual practitioner level, with the 2019 amendments to the Health Practitioners Competence Assurance Act (2003) now requiring all authorities to ‘*set standards of ... cultural competence (including competencies that will enable effective and respectful interaction with Māori) ...*’ (Section 118(i)). Box 1 below shows a contemporary definition of cultural safety.

Box 1: Cultural Safety in Aotearoa

Cultural safety requires healthcare professionals and their associated healthcare organisations to examine themselves and the potential impact of their own culture on clinical interactions and healthcare service delivery. This requires individual healthcare professionals and healthcare organisations to acknowledge and address their own biases, attitudes, assumptions, stereotypes, prejudices, structures, and characteristics that may affect the quality of care provided.

In doing so, cultural safety encompasses a critical consciousness where healthcare professionals and healthcare organisations engage in ongoing self-reflection and self-awareness and hold themselves accountable for providing culturally safe care, as defined by the patient and their communities, and as measured through progress towards achieving health equity.

Cultural safety requires healthcare professionals and their associated healthcare organisations to influence healthcare to reduce bias and achieve equity within the workforce and working environment.

Source: Curtis E, Jones R, Tipene-Leach D, Walker C, Loring B, Paine S-J, Reid P (2019). Why cultural safety rather than cultural competency is required to achieve health equity: a literature review and recommended definition. *Int. J. For Equity in Health*, 18:174. <https://dx.doi.org/10.1186/s12939-019-1082-3>

4.5 Gender Identity and Equity

Over time there has been an increase in women who participate in health professions and the majority of the professional health workforce positions are held by women. However, participation is not equal and in many professions there is a dearth of women particularly in senior positions. Thus there continues to be a gender inequality in the health workforce. Sadly, there continue to be sexist and discriminatory behaviours based on gender identity within the health workforce. 'Capital H' education will seek to address the importance of gender equity.

4.6 Sustainability with a Focus on the Impact of Climate Change on Human Health

The recently published sixth assessment report of the Intergovernmental Panel on Climate Change has reported that 'Human-induced climate change is already affecting many weather and climate extremes in every region across the globe'⁶. We need to prepare the future 'capital H' health workforce for the reality of health impacts of human-induced climate change. Indigenous equity and land rights are inextricably linked to sustainability. Thus we see the lenses of Equity and Sustainability as foundational partners for 'capital H' health education. This is not just a unique concept in in Aotearoa, but around the world, as described by key United Nations (UN) people.

'**Climate change** is happening now and to all of us. No country or community is immune', said UN Secretary-General António Guterres. 'And, as is always the case, the poor and vulnerable are the first to suffer and the worst hit'. ... '**Climate justice** insists on a shift from a discourse on greenhouse gases and melting ice caps into a civil rights movement with the people and communities most vulnerable to climate impacts at its heart'.

Mary Robinson - President of Ireland. <https://www.un.org/sustainabledevelopment/blog/2019/05/climate-justice/>

In Aotearoa (and worldwide) the concepts of indigenous equity, land rights and sustainability are embodied in the concept of **Kaitiakitanga**:

- Indigenous peoples play a crucial role in the conservation of the environment
- They make up around 5% of the global population and occupy, own, or manage an estimated 20% to 25% of the Earth's land surface
- This land area holds 80% of the planet's biodiversity and intersects with about 40% of all terrestrial protected areas and ecologically intact landscapes

In Aotearoa there are indigenous organisations that are leading substantially. They are described as '*Rangatahi led. Rangatahi driven. We are indigenous youth from the Pacific and Aotearoa working for climate action and indigenous sovereignty*'⁷. One of the domains of quality used in the Royal College of Physicians definition of quality includes sustainability:

Sustainability should be viewed as a characteristic of healthcare which must run through and moderates other domains. Healthcare should be considered not only in terms of what can be delivered to an individual today, but also to the population in general and the patients of the future⁸.

⁶ Available from https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

⁷ Available from <https://tearawhatu.org> [Accessed 14 September 2021]

⁸ Available from <https://www.rcpjournals.org/content/clinmedicine/10/6/537> [Accessed 14 September 2021]

Moreover, when placing health as a key focus of the nationally determined contributions to meet the goals of the Paris Agreement there is an opportunity to improve health co-benefits. This is illustrated in the transport scenario shown below⁹.

Figure 3: Number of Deaths Avoided 2040 under the SPS and the HPS per 100,000 Population, Relative to the CPS

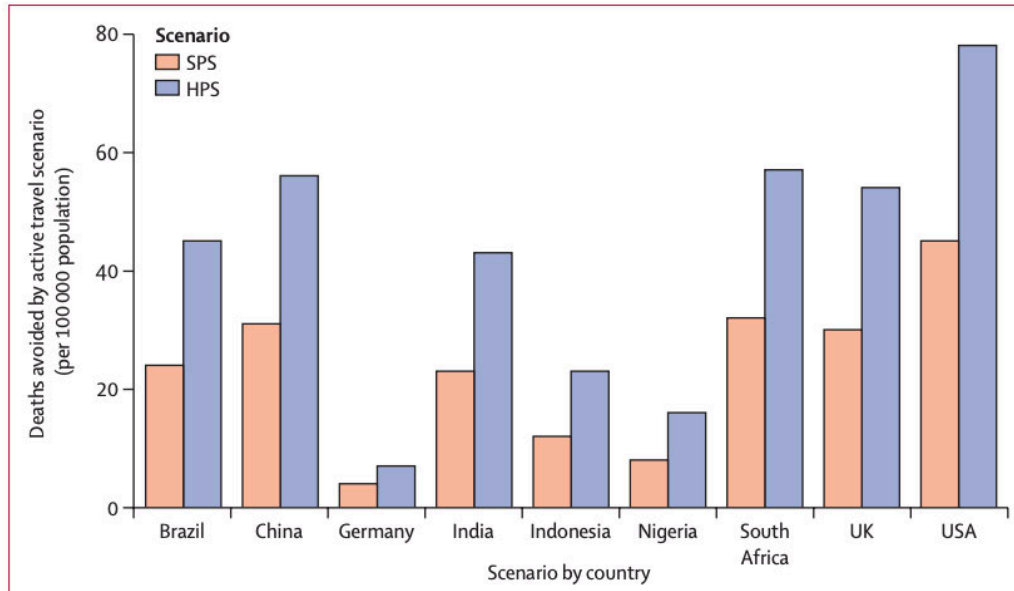


Figure 4: Number of deaths avoided in the year 2040 under the SPS and the HPS per 100 000 population, relative to the CPS

CPS=current pathways scenario. HPS=health in all climate policies. SPS=sustainable pathways scenario.

It is abundantly clear that the FMHS must prepare graduates for a world that is going to be impacted by climate change. It is an opportunity to focus on sustainable health care delivery and solutions.

Other considerations for redesigning 'capital H' healthcare education include:

- Opportunities for greenfield development to include wide range of topics and redesign
- Wide range of health opportunities and to modernise the curriculum
- International partnership opportunities

In summary, there are compelling reasons to consider an overhaul and redesign of FMHS health education.

⁹ Available from [https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(20\)30249-7/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30249-7/fulltext) [Accessed 14 September 2021]

5 Health Professional Education - Medicine

In **North America**, MD degrees after a four year pre-med college degree have been the norm in the USA for many decades. In 1997 the **United Kingdom** (UK) Medical Workforce Standing Advisory Committee recommended that clinical courses with graduate entry should be developed¹⁰. The rationale was to allow the faster production of doctors (a once-off effect), broaden the field from which doctors are recruited, to make more efficient use of existing educational capacity, and increase flexibility to respond to changing demand¹¹. Nearly half of the UK's 33 medical schools now offer graduate medical programmes, with 18 out of 20 of the highest ranked medical schools in the world being graduate entry¹².

There is some evidence that graduate entry students perform better on GAMSAT and UCAT, are more likely to graduate with honours degrees or first-class degrees, and favour deep over superficial learning, but findings are inconsistent^{13 14}. Moreover, much of the apparent advantages of graduate entry may be attributed to older age, rather than a prior degree¹⁵. Because the General Medical Council (GMC) mandates a minimum 5,500 hours of training to study medicine, graduate courses have a longer academic year and are more compressed than undergraduate courses, creating pressure on students^{16 17}. Despite the added pressure, some authors have found that graduate entry students have better coping skills and are not more stressed than undergraduates^{18 19}. In contrast, others have found that nearly half of graduate students have significantly higher anxiety scores, in the distressed range, than their undergraduate counterparts²⁰. Debt levels tend to be higher for graduate entry students and consequently these students take more time to pay off their debt²¹.

The dominant driver of the transition to graduate education in **Australia** was the University of Melbourne²². The philosophy of the so called 'Melbourne model' is for undergraduates to develop broader skills through a small number of general three-year degrees, while shifting to graduate entry professional training²³. This was a significant, university-wide transformation, that resulted in 96 undergraduate degrees being replaced by six degrees²⁴. To make the financial case, the university successfully lobbied for publicly subsidised graduate professional courses, the cap on the national student loan scheme to be lifted and an amendment to the Youth Allowance policy²⁵. During the 13-

¹⁰ Carter YH, Peile E. Graduate entry medicine: high aspirations at birth. *Clinical Medicine* 2007 April;7(2):143-147.

¹¹ Ibid

¹² Olivarius-McAllister J, Yapp N, Jacquemot A, Robinson A. Graduate entry medicine: the right way forward? *Postgraduate medical journal* 2021 Apr;97(1146):207-208.

¹³ Ibid

¹⁴ Sandover S, Jonas-Dwyer D, Marr T. Graduate entry and undergraduate medical students' study approaches, stress levels and ways of coping: a five year longitudinal study. *BMC medical education* 2015 Jan 24; 15(1): 5.

¹⁵ Wilkinson TJ, Wells JE, Bushnell JA. Are differences between graduates and undergraduates in a medical course due to age or prior degree? *Medical education* 2004 Nov; 38(11): 1141-1146.

¹⁶ Carter YH, Peile E. Graduate entry medicine: high aspirations at birth. *Clinical Medicine* 2007 April; 7(2): 143-147.

¹⁷ Olivarius-McAllister J, Yapp N, Jacquemot A, Robinson A. Graduate entry medicine: the right way forward? *Postgraduate medical journal* 2021 Apr; 97(1146): 207-208.

¹⁸ Ibid

¹⁹ Sandover S, Jonas-Dwyer D, Marr T. Graduate entry and undergraduate medical students' study approaches, stress levels and ways of coping: a five year longitudinal study. *BMC medical education* 2015 Jan 24; 15(1): 5.

²⁰ Casey D, Thomas S, Hocking DR, Kemp-Casey A. Graduate-entry medical students: older and wiser but not less distressed. *Australasian Psychiatry* 2016; 21(1): 88-92.

²¹ Olivarius-McAllister J, Yapp N, Jacquemot A, Robinson A. Graduate entry medicine: the right way forward? *Postgraduate medical journal* 2021 Apr; 97(1146): 207-208.

²² James R, McPhee P. Case study: The whole-of-institution curriculum renewal undertaken by the University of Melbourne, 2005–2011. *Strategic Curriculum Change in Universities*: Routledge; 2012. p. 157-172.

²³ Ibid

²⁴ Bolton R. Melbourne University vice chancellor Glyn Davis on funds, freedom and his future. *Financial Review* 2018 24 August.

²⁵ Ibid

year tenure of the Vice-chancellor, spanning the introduction of the model, annual funding increased from \$1.1 billion to \$2.56 billion²⁶.

The University of Melbourne educational objectives are set out in aspirational statements aiming to deliver the '*Melbourne Experience*'²⁷:

- distinctive undergraduate courses that offer pathways into professional graduate programs, but which also stand alone as strong degrees;
- a sound discipline-based education, including an introduction to research as a foundation for research higher degrees;
- closer alignment of course structures with desired graduate attribute outcomes;
- 'deep generalist' graduates with the generic and interdisciplinary skills suitable for both postgraduate programs and diverse and changing workplaces;
- a stronger likelihood of well-rounded and motivated graduate students at both Master's and PhD level;
- more informed student choice about careers and graduate education;
- a stronger shared experience, engagement and sense of university community;
- enhanced opportunities for external experiences such as community work or international study;
- strengthened international recognition of degrees;
- broader access for students, especially those from disadvantaged backgrounds;
- greater opportunity for students (and staff) to experience interdisciplinary teaching and research collaborations across the University;
- an improved classroom experience, including smaller classes for courses which move to graduate entry.

To address selection to vocational programmes an admission policy was put in place for very high achieving school students to be offered a guaranteed place in one of the university's graduate schools²⁸. An unanticipated outcome of the change was a modest improvement in the enrolments of students from lower SES backgrounds²⁹. The university is increasingly attractive to international students, who made up 44% of the student body in 2019 (pre-Covid)³⁰.

While there has been much debate about the success or otherwise of the change at the University of Melbourne, the university is ranked 31 in the world (THE) and 18 (WUR) for medicine and is financially viable. The Melbourne model change has been cited as the major reason that most Australian universities are now offering MD degrees. The move to graduate education occurred at the same time as the introduction of problem based learning, and necessitated a review of selection policies³¹.

²⁶ Ibid

²⁷ Ibid

²⁸ Ibid

²⁹ Ibid

³⁰ University of Melbourne 2019 Annual Report. University of Melbourne 2020 March 31:1-196.

³¹ Elliott SL, Epstein J. Selecting the future doctors: the role of graduate medical programmes. *Internal Medicine Journal* 2005;35:174-177.

Other reasons cited in Australia for introducing graduate entry medical programmes included:

- largely supported by students³²;
- broaden diversity so that not just school leavers with high maths and science achievers enter medicine³³;
- address social inequity caused by an imbalanced school system³⁴ ;
- higher motivation of graduates and a more informed career choice³⁵ ;
- students with increased maturity, breadth of education, diversity of background, and the capacity for self-directed learning and communication skills³⁶ ;
- evidence from the USA that older graduates were more likely to work in underserved areas³⁷.

What is less obvious from the literature, but clear from speaking to colleagues in Australia, is that while most medical programmes have shifted to MD degrees, many have retained undergraduate entry. In effect, some Australian universities took their existing 5/6 year MBBS programmes and converted them into a 'pre-med' degree and an MD. At these universities there is no graduate entry, other than through the specified 'pre-med' degree. The reasons for changing to MD degrees are diverse: so called 'market forces, the opportunity to modify the curriculum and assessment in a medical programme, to attract international students, enhanced funding and international name recognition of the MD degree.

The ability to attract international students is a major financial advantage for a number of universities in Australia, especially when there are overseas campuses. Not all Australian universities are necessarily trying to attract overseas students, preferring to focus on graduating doctors selected from their local catchment area and intending to return to work in the same area.

A significant difference between Australia and Aotearoa is the competition between medical schools. Consequently, medical schools have developed medical programmes with a point of difference. These include:

- Undergraduate entry as their 'competitive' advantage
- The type of doctor they wish to graduate e.g., clinician researchers
- Graduating doctors in the shortest time possible (4.75 and 5 years) to be 'work ready' and completing a professional project rather than a research project (typically thought to be necessary for an MD)
- Different campuses, including overseas campuses, with different lengths of programmes allowing for distinct learning experiences e.g., rural pathways

³² Ibid

³³ Sefton AJ. Australian medical education in a time of change: a view from the University of Sydney. *Medical education* 1995 May; 29(3): 181-186.

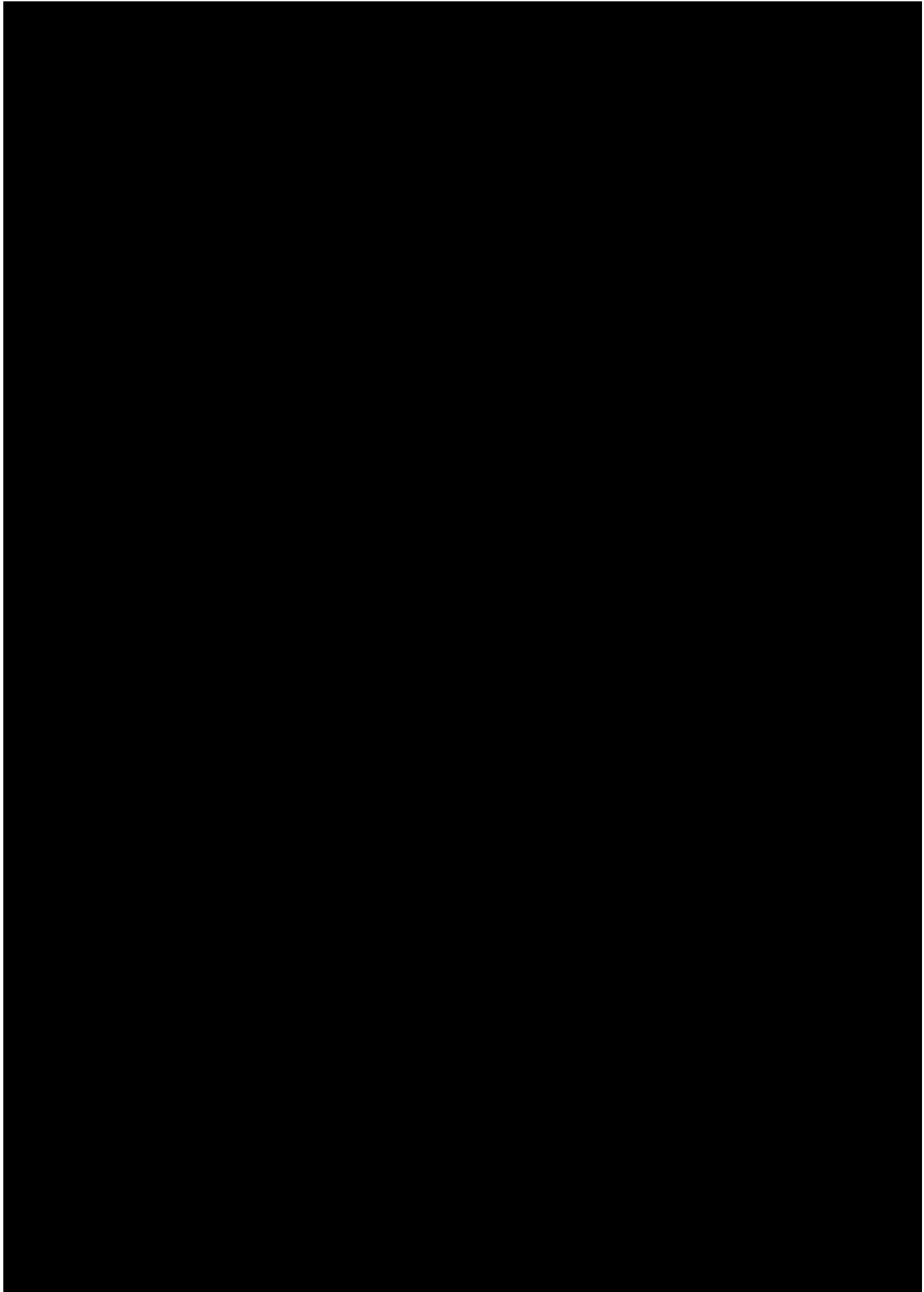
³⁴ Mifflin B, Harris P, Donald K, Bore P, Parker M, Groves M, et al. Graduate entry to medical studies: thoughts from 'down under'. *Medical teacher* 2003 Mar; 25(2): 109-111.

³⁵ Elliott SL, Epstein J. Selecting the future doctors: the role of graduate medical programmes. *Internal Medicine Journal* 2005; 35: 174-177.

³⁶ Finucane, Terry Nicholas, David Prideaux, Paul. The new medical curriculum at Flinders University, South Australia: from concept to reality. *Medical teacher* 2001; 23(1): 76-79.

³⁷ Carter YH, Peile E. Graduate entry medicine: high aspirations at birth. *Clinical Medicine* 2007 April; 7(2): 143-147.

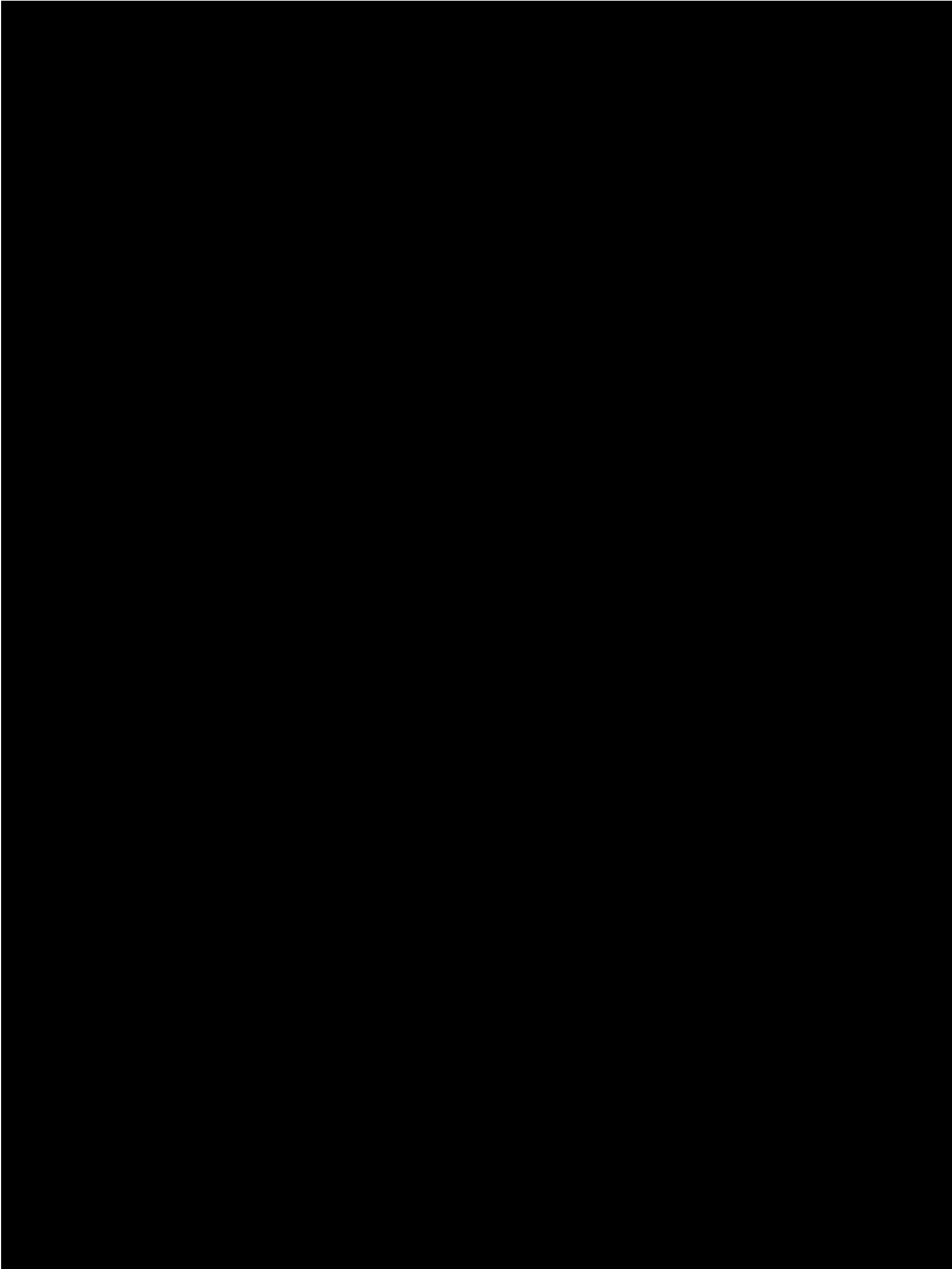
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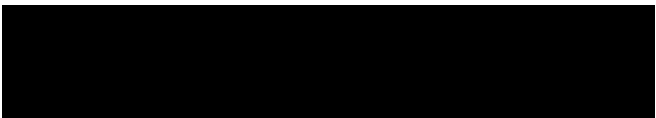


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7 Work to Date and Options Considered

7.1 The Scoping Study

To consider graduate health professional education, the FMHS undertook a scoping study. The working group were tasked with considering the medical programme and the role of the health professional in 2030 and beyond. They also considered the potential implementation of an MD degree for medicine; and whether other health professional programmes wished to consider postgraduate entry (or alternative educational strategies) to ensure fit for purpose health professionals.

Terms of Reference

1. Develop a model of the attitudes, knowledge and skills required of a health professional graduating in Aotearoa in 2030
2. Study the strengths and weakness of the current MBChB programme
3. Propose a rationale for why a change to an MD degree may be appropriate based on published evidence
4. Learn from overseas jurisdictions that have implemented MD degrees
5. Design entry pathways to an MD degree
6. Model the financial implications of a change to an MD degree
7. Propose a timeline for implementation of an MD, including regulatory approvals
8. Consider graduate entry for other FMHS health professional programmes
9. Consider alternative educational strategies to enhance health professional education in the FMHS

To summarise, this work has specifically considered the question: *‘would graduate entry educational model for the professions of medicine, nursing, optometry and pharmacy enable the health professional of the future to be better prepared?’*

Methodology

A working group was established (refer Appendix Five), with the membership growing and evolving during the course of the work as interested stakeholders requested to participate. Given the initial scoping nature of this work, the majority of participants have been from the FMHS. This has resulted in rich and varied conversations which have been key to the work described in this report.

The group met face to face monthly from March to August 2021, the via zoom in September 2021, with the final report due to FMHS in October 2021. In addition to monthly working group meetings, a student meeting with FMHS student stakeholder representatives, a stakeholder meeting with Māori and Pasifika student FMHS representatives and an FMHS Faculty Forum session have all been held, with themes from this feedback included within in the report.

Work To Date

This work completed has included:

- Review of the literature regarding health professional graduate entry programmes for the four in-scope professions
- Engagement with stakeholders across a range of medical schools at Australian universities to gain feedback regarding their graduate entry journeys

- Development of a set of principles (see Appendix Three) to guide options development which may include graduate entry health professional education
- Identification of strengths and weaknesses of the current educational pathways for the major health professional programmes in-scope for this work: medicine, nursing, optometry, pharmacy (available on request)
- Development of a shared understanding of what a graduate entry pathway could look like for each health professional programme, including risks and opportunities
- Agreement that a FMHS undergraduate degree is necessary looking to the future to build a common foundation for future healthcare professionals and development of a draft graduate profile
- A review of current graduate profiles for each health professional programme and development of a proposed graduate profile and degree structure for a new FMHS BMedHSc that considered the question:
 - *What common values, knowledge and skills would an undergraduate degree need to include to prepare students for graduate entry clinical study?*
- Consideration of issues should each healthcare programme transition to graduate entry (with a focus on medicine and pharmacy)
- Financial modelling of the revenue for the FMHS and each of the four in-scope health professional programmes

7.2 Options Considered

As these conversations have evolved, a number of options have been considered by the working group. While the focus of Section 8 is on a proposed FMHS new undergraduate degree and how this could feed into graduate entry health professional education, there were other options considered, and these are outlined briefly in Table 3 below.

Table 3: Options Analysis

Option	Strengths	Weaknesses
1 - Status Quo	<ul style="list-style-type: none"> • No Change 	<ul style="list-style-type: none"> • Doesn't address equity, diversity, sustainability, or governance issues • Doesn't cover ¼ of the FMHS EFTS • Doesn't allow a new FMHS Bachelor's Degree
2 - Revisit OLY1	<ul style="list-style-type: none"> • Fix this so that 10% of EFTS don't exit at the end of Year One (noting BSc Biomed retention is much higher) • Retains the school-leaver entry option 	<ul style="list-style-type: none"> • May still not address the unhealthy behaviours and significant stress generated from the highly competitive nature of entry to the MBChB programme • Doesn't modify the latter years of the professional programmes
3 - FMHS Undergraduate (UG) Degree	<ul style="list-style-type: none"> • Would offer a contemporary UG 'Health' degree option focused on equity and sustainability • Would prepare future students for a wide range of 'Health' careers, not just the healthcare professions • Will retain EFTS within the Faculty while supporting students to explore the wide 	<ul style="list-style-type: none"> • Would mean a significant change for current BHSc and potentially BSc (Biomed) • Has cross-Faculty implications for funding (EFTs) and teaching • Would need careful thinking through re: student (career and employment) destinations if they exist at this point • Requires significant curriculum design (except nursing)

	range of health career options that are available to them	
4 - FMHS Undergraduate (UG) Degree AND health professional graduate entry	<ul style="list-style-type: none"> • As above plus ... • Provides time and course options to prepare students for 'Health' and health professional careers • Green field approach to reshape education in professional degrees and clinical placement models • International partnership arrangements could be explored • Streaming e.g., <ul style="list-style-type: none"> ○ Rural ○ Research (e.g., MD/PhD programme), and/or ○ Te Reo Māori stream for indigenous speakers 	<ul style="list-style-type: none"> • As above plus ... • Would require suitable bridging course(s) / programme for potential healthcare students who did not take the FMHS UG degree • The (potentially) longer study time in years (for all programmes) could be a significant disadvantage for all students, especially Māori and Pasifika students • Tāmaki Makaurau is expensive to live and study • School-leaver students who want a 'shorter time' to achieve their qualification will choose other universities • [REDACTED] • [REDACTED] • [REDACTED] • May be some trade-offs for Medicine with a 5 year professional programme reduced to 4 years

[scope]

If the curriculum and structure of any such future health UG degree is considered at another time, the working group's view of the major advantages of the proposed new degree are associated with governance of the proposed degree, and include:

1. Being FMHS-led allows the Faculty to determine entry criteria, student numbers, promotion to schools, and the marketing of the degree in terms of showing the full spectrum of career opportunities in health and the wider health related economy
2. FMHS governance allows the Faculty to determine the graduate profile, the curriculum direction, assessment, administration, and communication associated with a single broad health degree, in consultation with other Faculties
3. It allows FMHS to have a more comprehensive and ongoing approach to support Māori and Pasifika students in all domains covered by the degree rather than just the students in professional programmes
4. Strategically it underpins FMHS strategic goals out to 2030 to become a health innovation campus that is part of a wider health innovation precinct to produce graduates who can contribute to the health and wealth of Aotearoa
5. It gives FMHS the mana that has been earned as the major provider of health professional education and health research in Aotearoa

Outstanding areas of common concern/uncertainty currently include:

- Are graduate entry health programmes suitable for all four programmes within scope of this work, or only some?
- What would this do for equity? We must not lose (and need to continue to build on) equity gains for Māori and Pasifika, particularly for the non-medicine professions

- Do the families and whānau of Māori and Pasifika students (and potential students themselves) understand and support this change, including the risks of increased student debt and longer total training time (in years)?
- Do employers want a longer/shorter pathway to train these specific healthcare professions?
- How would selection processes work for a graduate entry health professional programme (assuming current affirmative pathways remain)?
- Could OLY1 be retained and improved if a health professional programme did not move to a graduate entry pathway?
- How do we continue to strengthen interprofessional learning?
- How will competitor universities respond (or not) if (these selected) health professional programmes move to a graduate entry model?
- Financial implications of any proposed change
- Relationship with other Faculties

7.3 Pedagogy

Taumata Teitei has reinforced the importance of innovative pedagogy, while building on existing expertise. The pandemic has also driven us to engage in new ways of learning, using online and blended methodologies. While the detail of the pedagogy is still to be decided, and may vary according to the discipline, the core tenants will include:

- Teaching will be framed in Te Tiriti accountabilities
- Kaupapa Māori pedagogies and matāuranga Māori will be employed to ground student learning in the context of Aotearoa
- Research led teaching that is grounded in scientific evidence and transdisciplinary in nature
- Collaborative and enquiry-based learning pedagogies along with work-integrated learning, are core for health professional work readiness
- Student choice and a wide range of learning experiences and pathways will be available

Delivery of learning

- A mixture of small group, hybrid, and experiential methodologies, supplemented by online material will be used to deliver a high-quality learning experience
- Where practicable, small groups and small cohorts will be used to maximise collaborative learning and a nurturing learning environment
- Simulated and clinical skills learning experiences will ground contextualise student learning and prepare health professional students for learning in clinical environments

8 A Proposed Way Forward

8.1 An FMHS Undergraduate Degree

Figure 4 below shows the current and proposed future state with the inclusion of the new BMedHSc degree.

Figure 4: Current and Proposed Future State of Programmes

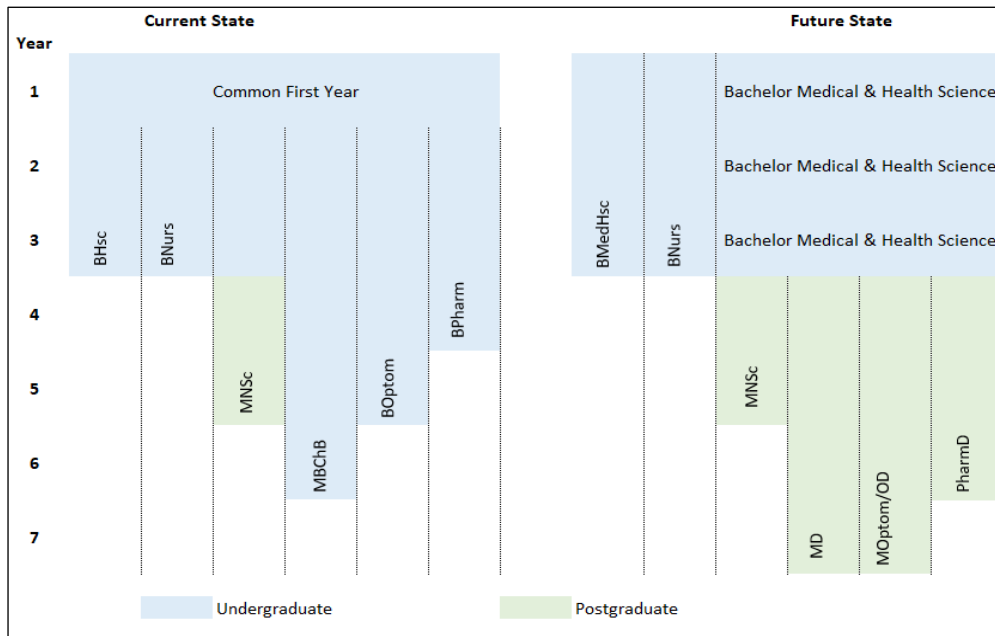
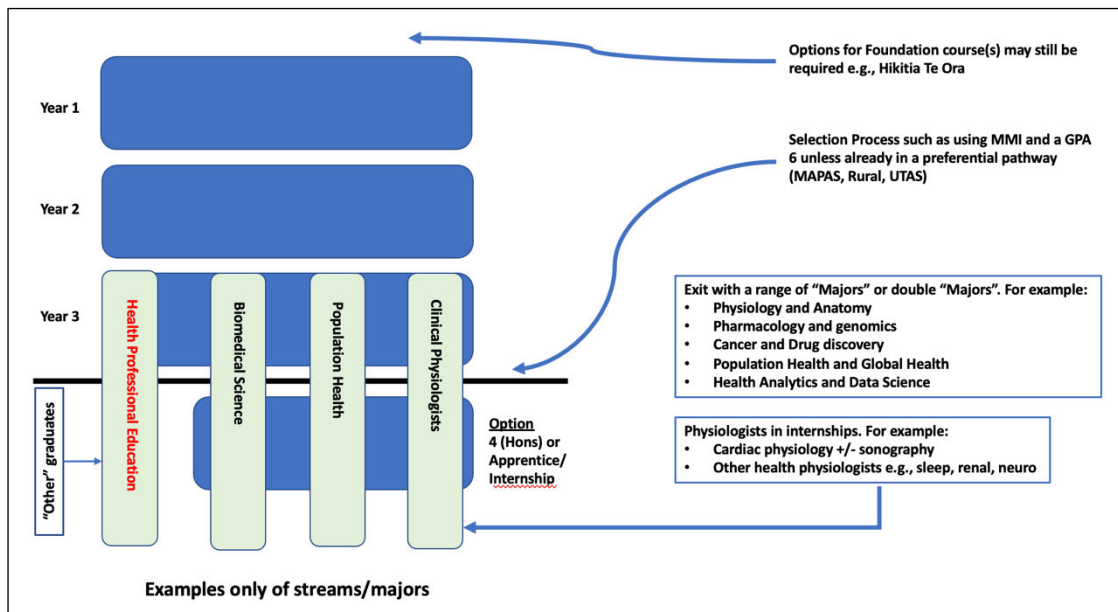


Figure 5 below shows the schematic of a proposed FMHS new undergraduate degree that would act as a feeder to graduate entry healthcare programmes.

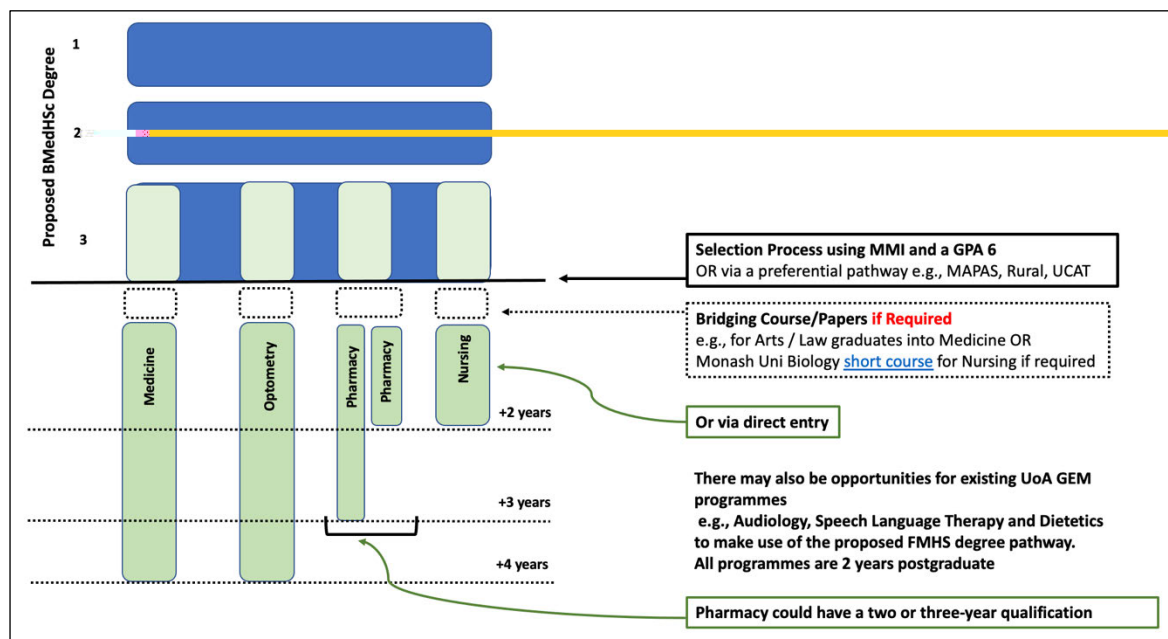
Figure 5: Proposed New Bachelor Medical & Health Science (BMedHSc) Degree



There is a tension between clinical discipline-specific knowledge and skills (i.e., medicine, nursing, pharmacy, optometry, etc.) and shared and/or interprofessional knowledge and skills. If a three-year, interprofessional undergraduate degree is of value to the professions, then it must have covered essential skills and knowledge. Therefore, that should be a legitimate rationale for reducing the number of subsequent years required for discipline-specific learning (rather than grafting of the same number as currently). Discipline-specific years in all programmes will also need radical revision if the three-year undergraduate programme precedes them. The three-year BMedHSc programme will also need sufficient content to prepare students who do not choose a health professional career pathway for careers in Health (and health science).

Figure 6 below shows more detail of the proposed health professional stream as a graduate entry option for the four health programmes currently under consideration.

Figure 6: Proposed 'Health Professional Stream' Graduate Entry Pathway Options



A proposed draft graduate profile for the new degree has been developed (refer Table 4 below), taking into consideration current work around the curriculum transformation project.

Table 4: Bachelor Medical & Health Sciences - Draft Graduate Profile

<p style="text-align: center;">Hauora Māori (from Te Ara)</p>	<ul style="list-style-type: none"> • Demonstrate a commitment to practice in accordance with Te Tiriti o Waitangi in the context of improving Indigenous health and upholding Indigenous rights by appropriately engaging with Māori individuals, whānau and communities • Apply the knowledge of historic, demographic, socioeconomic, and policy influences on health status to explain how ethnic inequalities in health are created and maintained and how they may be reduced and eliminated. • Critique the influence of one’s own culture and that of the health system on patient and population health outcomes to continually reflect on one’s practice and actively participate in self audit in respect of the Te Tiriti • Identify and address professional development needs as a basis for life-long learning about Māori health
<p style="text-align: center;">Populations / Health/ Sciences (from BHSc +BSc + Clin)</p>	<ul style="list-style-type: none"> • Draw on a broad scientific body of knowledge encompassing biological, behavioural, and social sciences to explain the normal structure, function and development of the human body and mind at all stages of life, the factors that may disturb these and the interactions between body and mind • Explain how social, political, economic, environmental, and cultural determinants: (1) influence morbidity and mortality that affect the health and wellbeing of whole populations; and (2) could potentially prevent diseases, disability, and injury • Apply the scientific body of knowledge appropriately to address sustainability and sustainable practices, explaining the causes and consequences of climate change, adaptation, and mitigation strategies pertinent to Aotearoa and the South Pacific • Demonstrate an understanding of the role of data science, machine learning, artificial intelligence, and advanced technologies in the context of human health and wellbeing • Demonstrate the ability to communicate about risk in an environment of uncertainty through reasoned arguments and interpretations constructed by locating and evaluating information, and analysing qualitative and quantitative data about health • Apply disciplinary theory, analysis, research, and creative skills in seeking solutions to complex health problems and inequities • Form and evaluate research strategies, including developing research questions, and discern and assess possible methods for answering them, demonstrating independent critical thought • Take a systems-based approach to designing responses to challenges in health, health systems and society • Appraise national and global dimensions of intellectual, political, environmental, and economic activities affecting health
<p style="text-align: center;">Professional and Communication Skills</p>	<ul style="list-style-type: none"> • Use, manage, present, and communicate information effectively using clear English and/or Te Reo Māori in a range of media and formats • Demonstrate understanding of self in relation to others, reflecting on one’s own and others’ world viewpoints and principles of cultural safety • Build and enable respectful and sustainable collaborative relationships to improve health within diverse communities • Recognise the responsibilities associated with autonomous academic inquiry and engage in scholarship respectfully and constructively • Identify the ethical dimensions of contexts, actions and policies and draw upon ethical theory to formulate and justify principled responses • Navigate personal, academic, and professional challenges with integrity, taking responsibility for academic and professional decisions, conduct • Use appropriate teaching and learning strategies to educate themselves, peers, other professionals working in health and the community • Lead and be advocates of health in a diverse community, including accepting social and civic responsibilities

8.2 Selection

There has been robust debate regarding a selection process for any graduate entry programme, with the major concern being that it is not good enough to merely shift the 'pressure point' from the current OLY1 process to (potentially) the end of a three-year degree, without other factors also changing. It is widely acknowledged that the competitive nature of the current OLY1 selection process does not promote the types of attitudes and behaviours needed from our future healthcare professionals, and is significantly detrimental to students' health and well-being. This must change.

The most competitive programme entry currently is medicine. Options for selection that have been debated have included:

- School leaver entry (confirmation of medical school place, subject to meeting required academic and professional practice requirements) on entry to a proposed new FMHS undergraduate degree
- A weighted ballot for entry to the medical programme (like the Netherlands model)
- Graduate entry pathways
- Graduate entry pathways with/without a bridging programme
- A range of GPA scores

It is currently proposed that:

- The current preferential entry pathways for MAPAS students, students from regional and rural backgrounds and those via the undergraduate targeted admissions scheme ([UTAS](#)) remain unchanged,
- Other criteria include a minimum GPA of 6⁶⁷ and
- An interview process inclusive of an MMI.

Māori and Pasifika Student Selection

It has been challenging to find any commentary regarding the ability (or otherwise) of graduate entry programmes to address the lack of ethnic diversity in healthcare programmes, particularly for indigenous populations where there are increased health disparities compared to the dominant colonial culture(s).

A study of over 500 undergraduate and graduate entry physical therapy graduates in the USA in the early 1990s concluded that the undergraduate programmes appeared to attract a greater percentage of 'minority' individuals (14.9% versus 5.8%, respectively)⁶⁸. A single-site study in the UK also found that ethnic minority (non-white) applicants formed a smaller proportion of applicants for the graduate entry compared to the undergraduate programme (31.7% versus 39.8% respectively)⁶⁹. A large multicohort study looking at applicants to UK medical schools from 2006 – 2014 found that *'the odds of getting an offer to study medicine were lower if the applicant was male, graduate, from black and minority ethnic background and from lower socioeconomic groups'*⁷⁰.

⁶⁷ Note that this proposed GPA score is higher than the GPA required for the MNurs Sci programme (refer Table 2 above).

⁶⁸ Warren SC, Pierson FM. Comparison of characteristics of entry-level bachelor's and master's degree students in physical therapy. *Physical Therapy* (1994). 74:4

⁶⁹ James D, Ferguson E, Powis D, Symonds S, Yates J (2008). undergraduate and graduate entry to medicine: widening academic and socio-demographic access. *Medical Education*. 28: 294 – 300. <https://dx.doi.org/10.1111/j.1365-2923.2008.03006.x>

⁷⁰ Kumwenda B, Cleland J, Greatix R, MacKenzie RK, Prescott G (2018). Are efforts to attract graduate applicants to UK medical schools effective in increasing the participation of underrepresented socioeconomic groups? A national cohort study. *BMJ Open*. 8:e018946. <https://dx.doi.org/10.1136/bmjopen-2017-018946>

What is known from UoA published research regarding health professional study (non-graduate entry) for BHSc, BNurs and BPharm is that:

Ethnic disparities in academic outcomes show patterns of privilege and should be alarming to tertiary institutions. If institutions are serious about achieving equitable outcomes for Māori and Pacific students, major institutional changes are necessary that ensure the unique needs of Māori and Pacific students are met (Wikaire et al, 2016)⁷¹.

Of ongoing and significant concern to the non-medical programmes is their lack of students from Māori and Pasifika backgrounds, as those students who are successful via the OLY1 process will almost invariably go into medicine. For example, the optometry school offers 150 places to fill 60, but the top ranked students invariably go to medicine and attracting Māori and Pasifika students is almost impossible. A key principle of this work (refer Appendix Three also) is shown below:

‘Any change to education must enhance the participation and ultimately graduation of Māori and Pasifika people in health professional education. This means that any consideration of proposed change has an equity lens applied as a first principle. To avoid doubt, no change to the delivery of healthcare professional education should create further barriers for Māori and Pasifika people’

Feedback from one Australian stakeholder at a medical school commented *‘graduate entry healthcare programmes are about contesting status, rather than aligning to community needs’*. We need to be cognisant of this perspective when engaging with and considering feedback from Māori and Pasifika communities and stakeholders.

This means that the wider work must continue and expand to support Māori and Pasifika tamariki to be successful in science subjects at high school, including exposure as early as possible to the wide range of health careers available at the UoA. The Hikitia Te Ora - [CertHealthSci](#) may also remain important to ensure students have good foundation skills before commencing tertiary programmes, as well as ongoing MAPAS pastoral and academic support. Additionally, ongoing work to address the lack of diversity in the teaching staff and student body, and addressing implicit and explicit institutional racism is both necessary and essential if these programmes are going to attract, retain, and successfully graduate Māori and Pasifika students^{72 73}.

8.3 Pre-Requisites for Graduate Entry Health Professional Programmes

Potential bridging courses / papers (pre-requisites) for each health professional programme are still to be determined, and could be different depending on where (and when) the student’s undergraduate degree was completed. Appendix Four contains details of current pre-requisites for the G8 universities for each in-scope health programme. Australia has the ATAR⁷⁴, which provides a

⁷¹ Wikaire E, Curtis E, Cormack D, Jiang Y, McMillan L, Loto R, Reid P. Patterns of privilege: A total cohort analysis of admission and academic outcomes for Māori, Pacific and non-Māori non-Pacific health professional students. BMC Education (2016). 16:262 <https://dx.doi.org/10.1186/s12909-016-0782-2>

⁷² Reid P, Cormack D, Paine S-J. Colonial histories, racism and health – the experience of Māori and indigenous peoples. Public Health (2019). 172; 119 – 124

⁷³ Morrison N, Machado M, Blackburn C. Student perspectives on barriers to performance for black and minority ethnic graduate-entry medical students: a qualitative study in a West Midlands medical school. BMJ Open (2019). 9:e032493

⁷⁴ The ATAR is the primary mechanism used nationally in Australia for tertiary admissions and indicates a student’s position relative to other students. It is the standard measure of a student’s overall academic achievement in relation to other students where these students have studied different subject combinations. ATARS are expressed as a number on a 2000-point scale from 99.95 down to 0.00 in steps of 0.05.

standardised comparable rank between students, and all programmes set a minimum ATAR for admission.

The G8 graduate entry **medical** programmes all require students to complete an undergraduate degree, and some also specify subjects (UQ, UWA, Uni Melbourne and Uni Sydney). University of Sydney is the only university that offers an online foundational knowledge course is available to all students on enrolment to ensure assumed knowledge in anatomy, physiology, molecular and cell biology is met, and 20% of their MD students come from non-biomedical science educational backgrounds.

Given that there are only two medical schools in Aotearoa and 48% of the UoA 2021 intake (year two of the MBChB) are graduates, flexibility for student options to enter the programme will need to be considered to maintain the diversity of student backgrounds and experience that is beneficial for our future doctors.

Box 2: Analysis of the current MBChB Year Two cohort of 264 domestic students (2021)

- 45% of all students have come through a UoA pathway
- 48% of the class (127 students) are graduate entry
- The majority education provider for previous qualifications for the graduate entry cohort was UoA (68 students), followed by Otago University (44 students)
- Most graduate entry students came from a science background (50%), followed by 'other' (24%), health sciences (14%) and biomedical science (11%)
- Within the 'other' cohort were 15 students with previous healthcare qualifications: pharmacy (5), nursing (4), physiotherapy (3), oral health (2) and podiatry (1)
- 45% of the class came through OLY1
- 18 students completed the Cert in Health Science

[scope]

8.4 Māori and Pasifika Student Feedback

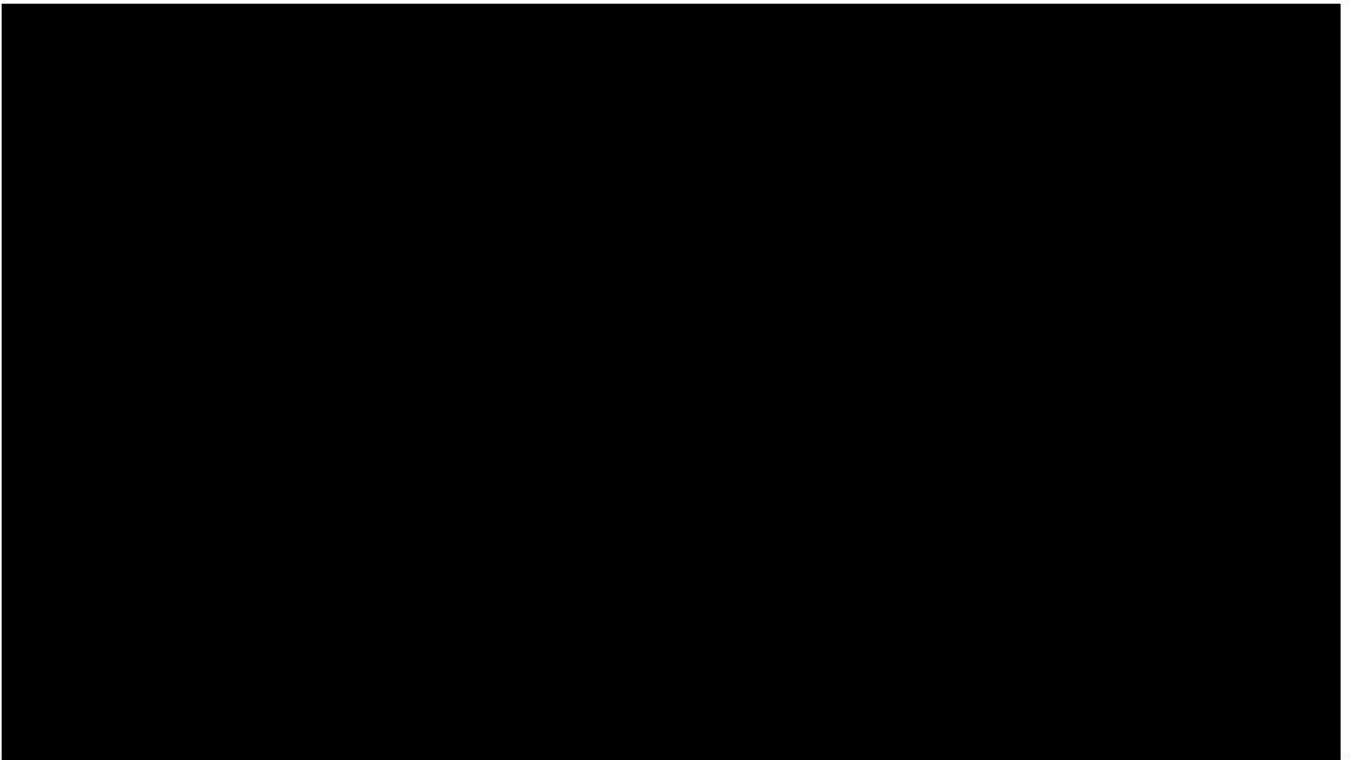
Fifteen 3rd, 4th and 5th year Māori and Pasifika medical students participated in a zoom meeting specifically to discuss and share their feedback on this proposal⁷⁵. Overall, the students liked the concept of diversity of graduates entering health careers and felt this was a positive move.

We bring our families with us and it plays a big role in what we do, how long we do it for, and what ends up being given back to our families and communities. Seven years is an extra year, and Māori and Pasifika students are more likely to be in poorer areas of education, from low decile schools - then that would make it eight years. Time, money, living in Auckland. What would you do to help Māori and Pasifika students? (Student participant)

Student feedback centred on their concerns regarding the increased length of study required to register as a health professional, but there were other themes and these are summarised below:

- Increased length of the medical programme (3 + 4 years), and added another year if the CertHSc needs to be completed
- Burnout for students - related to additional length of time studying and associated stresses
- Living and training in Auckland (e.g., cost of living, housing), with concerns about any potential increase in the cost of training (with additional years)
- Is the vision of what you are trying to achieve worth lengthening of training?
- Could students study a different UG degree (or this degree via distance learning) closer to home, then enter the pathways for health professions at UoA?
- The main barrier for Māori and Pasifika students is getting to university in the first place. High school preparation for Māori and Pasifika students (many of whom come from low decile schools) is inadequate, which is why the CertHSc is currently important
- High school students do not receive good knowledge about the range of health careers available and this impacts their choices (coupled with whānau/family pressure) as medicine is seen as a good (prestigious) career where you can earn good money
- Some people would still want to do an UG pathway for a health career as it's shorter e.g., nursing
- Māori and Pasifika students need support and a safe space to achieve academically. Would you increase programmes and funding to MAPAS to enable Māori and Pasifika students to reach their potential?
- In terms of selection criteria, some students felt an interview would be good to include, as well as the MMI. There was also feedback that aptitude tests are another barrier for Māori and Pasifika students (compared to Australian indigenous student medical school selection processes)

[scope]



8.6 Threats and Opportunities Analysis

Based on stakeholder feedback to date, an analysis of threats and opportunities is shown below. There are differences by school and programme. While acknowledging that this analysis below is subjective, it has been collated to reflect feedback from the working group.

Opportunities Scoring Matrix

OPPORTUNITIES		Impact		
		High	Medium	Low
Likelihood	High			
	Medium			
	Low			

Table 5: Opportunities Analysis

Opportunities	Medicine
Develop a modern, Hauora Māori inclusive new FMHS UG degree	
Develop better-prepared students for the future workforce	
Will attract additional 'mature' students from other backgrounds / careers	
Will broaden the opportunities to attract ↑ numbers of students	
Will attract increased numbers of Māori students	
Will attract increased numbers of Pasifika students	
Foundation degree provides opportunities for new PG vocational and research pathways that add value to the new UG degree	
Could strengthen pathways for rural and remote students	
More opportunities for interprofessional learning	
Shorter number of years to become a health professional will speed up number of healthcare professions entering the workforce ⁷⁶	
Ability to better showcase the whole spectrum of career opportunities in the health and the health economy	
Governance of a new UG degree will facilitate alignment with new strategic directions of the FMHS to develop a Health Innovation Precinct at Grafton	
Engagement through co-design of new programmes (and supporting structures e.g. committees) with communities they will serve	

Threats Scoring Matrix

THREATS		Impact		
		High	Medium	Low
Likelihood	High			
	Medium			
	Low			

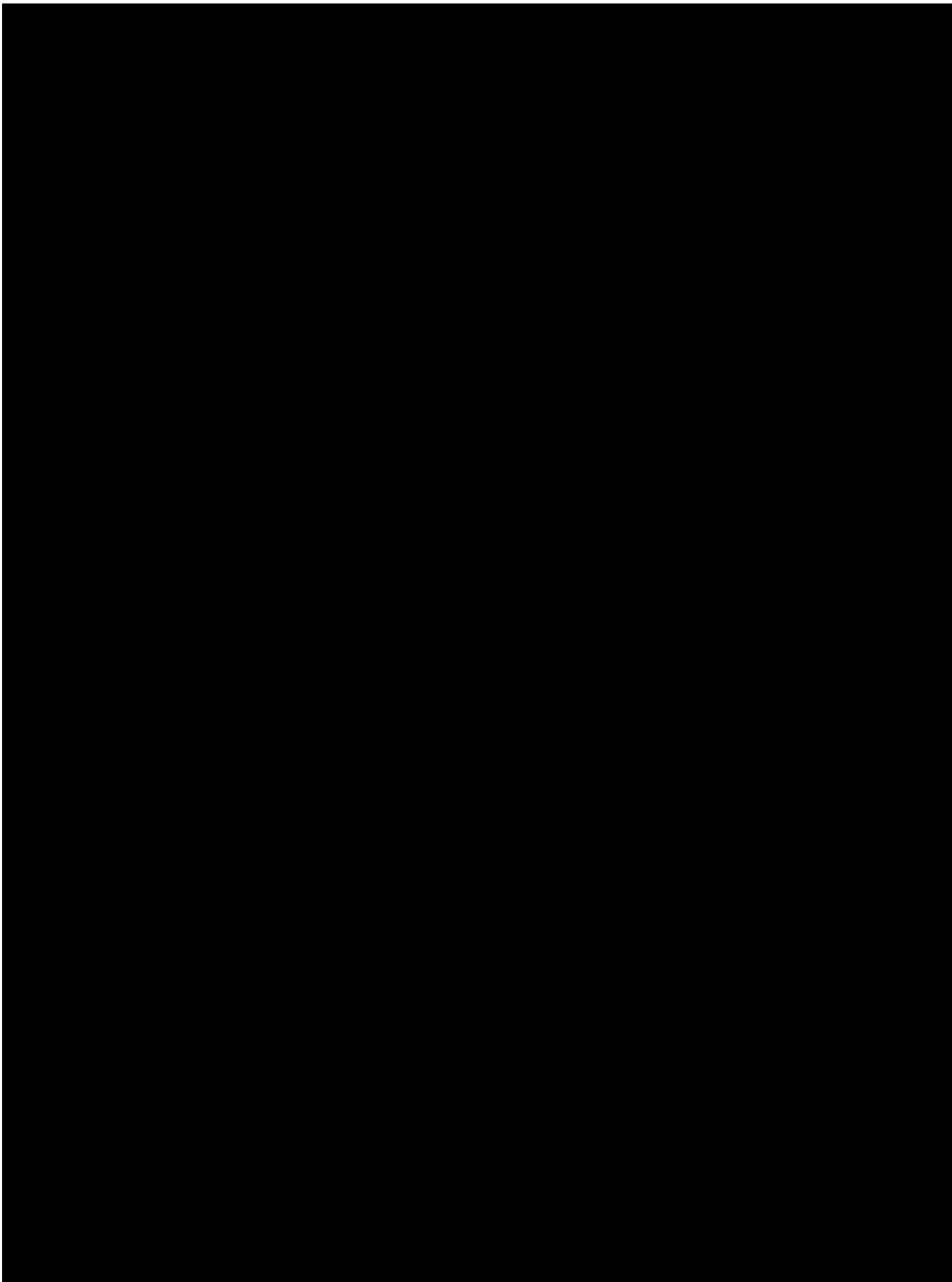
⁷⁶ If counted as graduate entry to a health professional programme following initial undergraduate degree +/- work experience

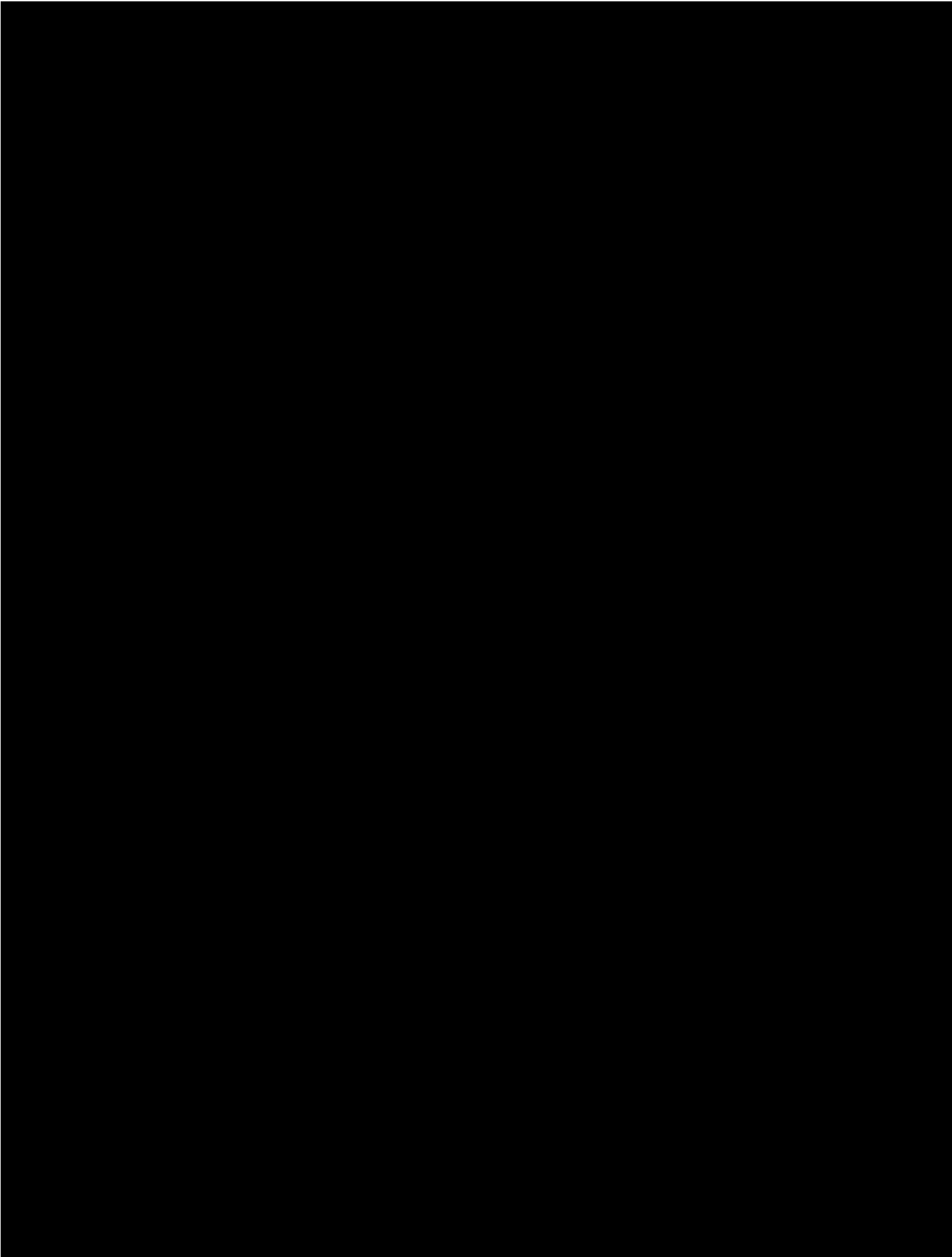
Table 6: Threats Analysis

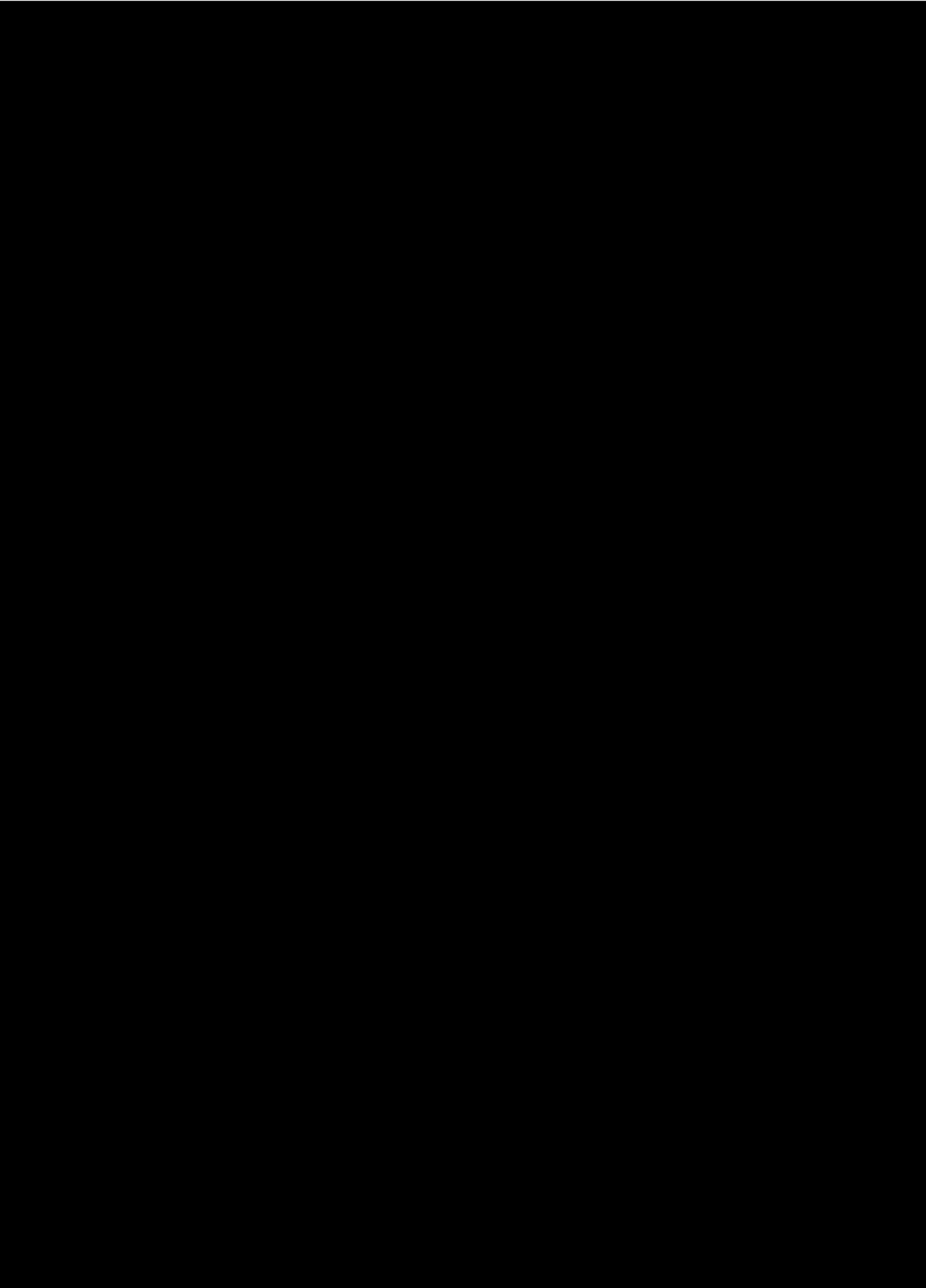
Threats	Medicine
If we keep doing what we've always done	Yellow
Funding	Orange
Change in change-fatigued university	Red
Different to other universities	Light Green
School leavers enrol at other universities	Orange
Size of school/programme impacts on ability to change (vulnerability)	Light Green
New curricula development	Orange
Double-teaching during programme transition	Red
Will require re-accreditation (major change)	Yellow
May worsen equity for Māori students	Red
May worsen equity for Pasifika students	Red
May transfer OLY1 competitive environment from Year 1 to Year 3	Orange
Increased number of years (in total) to become a health professional ⁷⁷	Orange
Pressure on clinical placements – if ↑ student volumes +/- model(s)	Red
Could adversely impact relationship with other Faculties	Yellow
Dilution of deep disciplinary knowledge in traditional areas of biomedical and/or health science strength	Light Green
Management of increased class sizes in “core” subjects will place stress on facilitates especially in practical and laboratory classes	Red

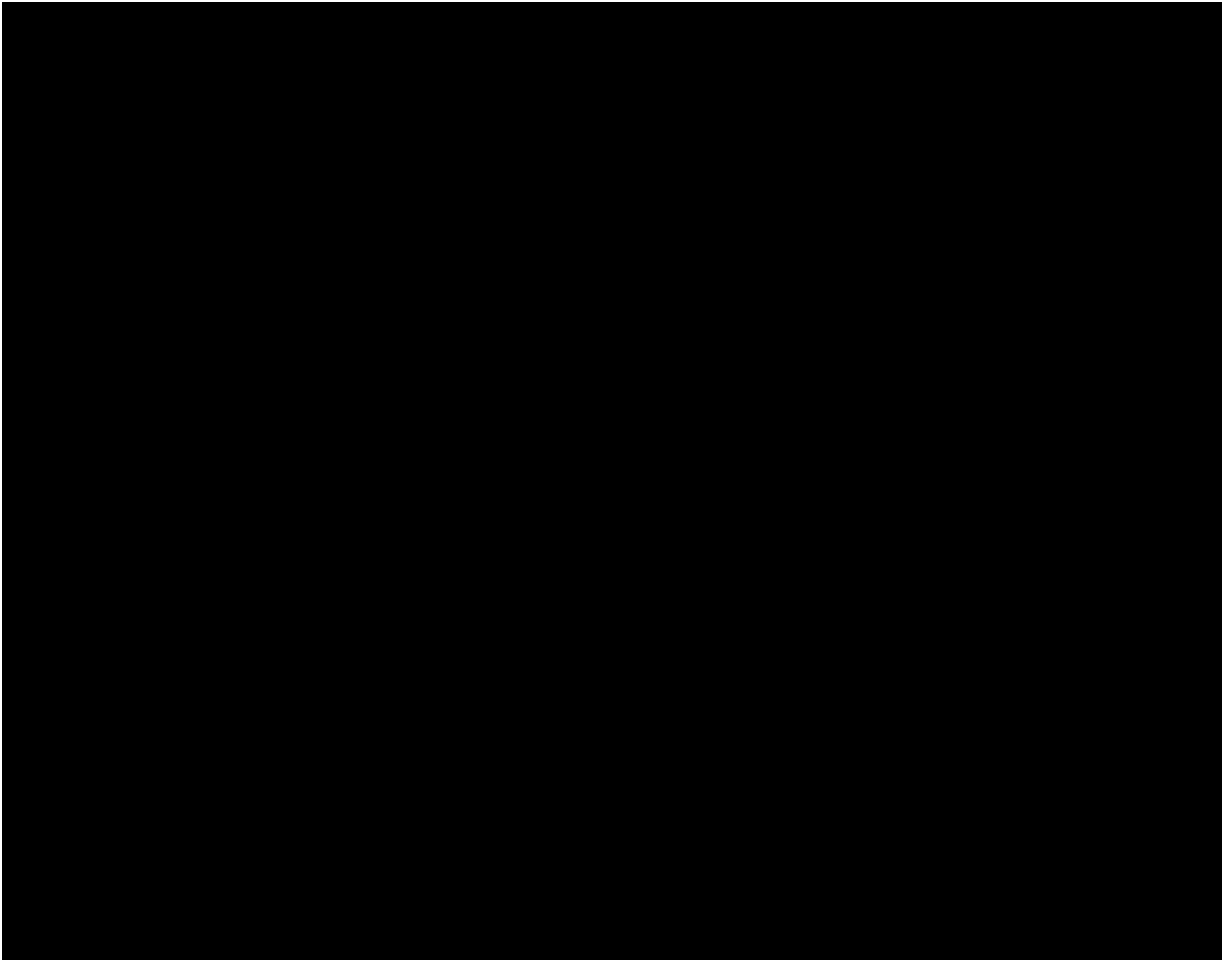
Appendix Six contains specific feedback on this draft proposal from the School of Biological Sciences (Faculty of Science).

⁷⁷ If counted as direct entry to university following leaving school









8.8 Transition Considerations

How the cohorts of students will move through the years of study have also been modelled, looking at when the current structure ends and when the new one begins. The two programmes with significant transition considerations are medicine and pharmacy, and these are discussed in more detail below.

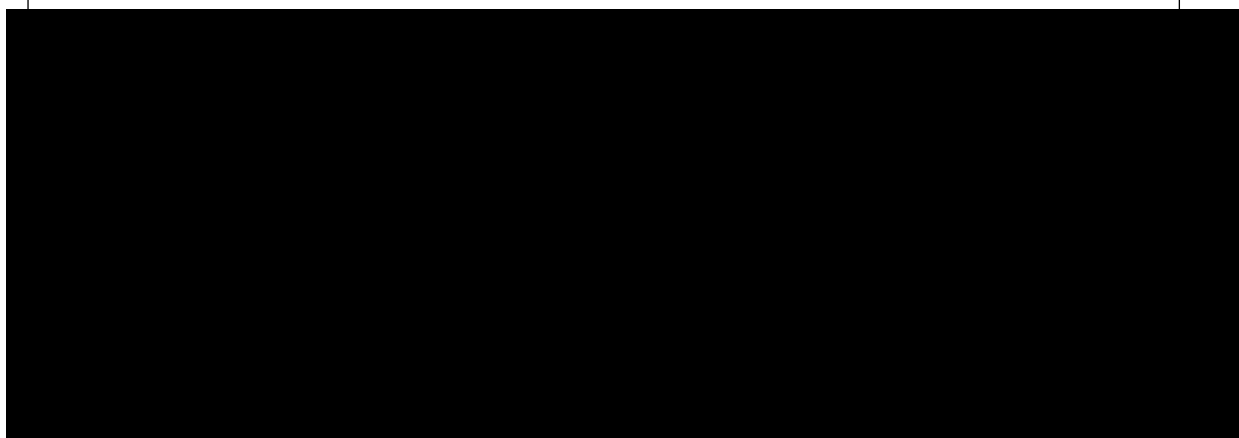
A key operational constraint is related to the medical programme clinical placements, currently limited to 900 placements. Modelling has been conducted to account for this constraint in years 4-6 of the current MBChB programme and years 2-4 of the proposed MD programme.

Figure 10 below shows the transition modelling for all programmes and includes a 'Gap Year' for medicine. In this model, there is a year of 'no intake' of medical students into either of the medical programmes. In this example, Figure 10 shows no students in MBChB 2 or MD 1 in 2025. This allows a continuous supply of graduates each year, without exceeding (clinical placement) capacity. There will be a transition year in 2023 at the undergraduate level allowing a cohort of students to proceed into the second year of the BMedHSc if they do not gain entry into the first year of the MBChB programme for 2024. A gap year approach would result in a revenue drop in Year 3 as a year of TEC SAC funding is lost, with no new students entering the medical programme in 2025.

Figure 10: Transition Modelling Showing the 'Gap Year' for Medicine

	current	year 1	year 2	year 3	year 4	year 5	year 6	year 7	
Years	2022	2023	2024	2025	2026	2027	2028	2029	
UG Entry									
OLY1	x	x	x	x	x	x	x	x	BMHS 1
			x	x	x	x	x	x	BMHS 2
				x	x	x	x	x	BMHS 3
Medical Programme									
MBChB - 2	300	300	300	gap					
MBChB - 3	300	300	300	300	300	300	300	300	MD - 1
MBChB - 4	300	300	300	300	300	300	300	300	MD - 2
MBChB - 5	300	300	300	300	300	300	300	300	MD - 3
MBChB - 6	300	300	300	300	300	300	300	300	MD - 4

[scope]



transition

Current

Proposed

Note:

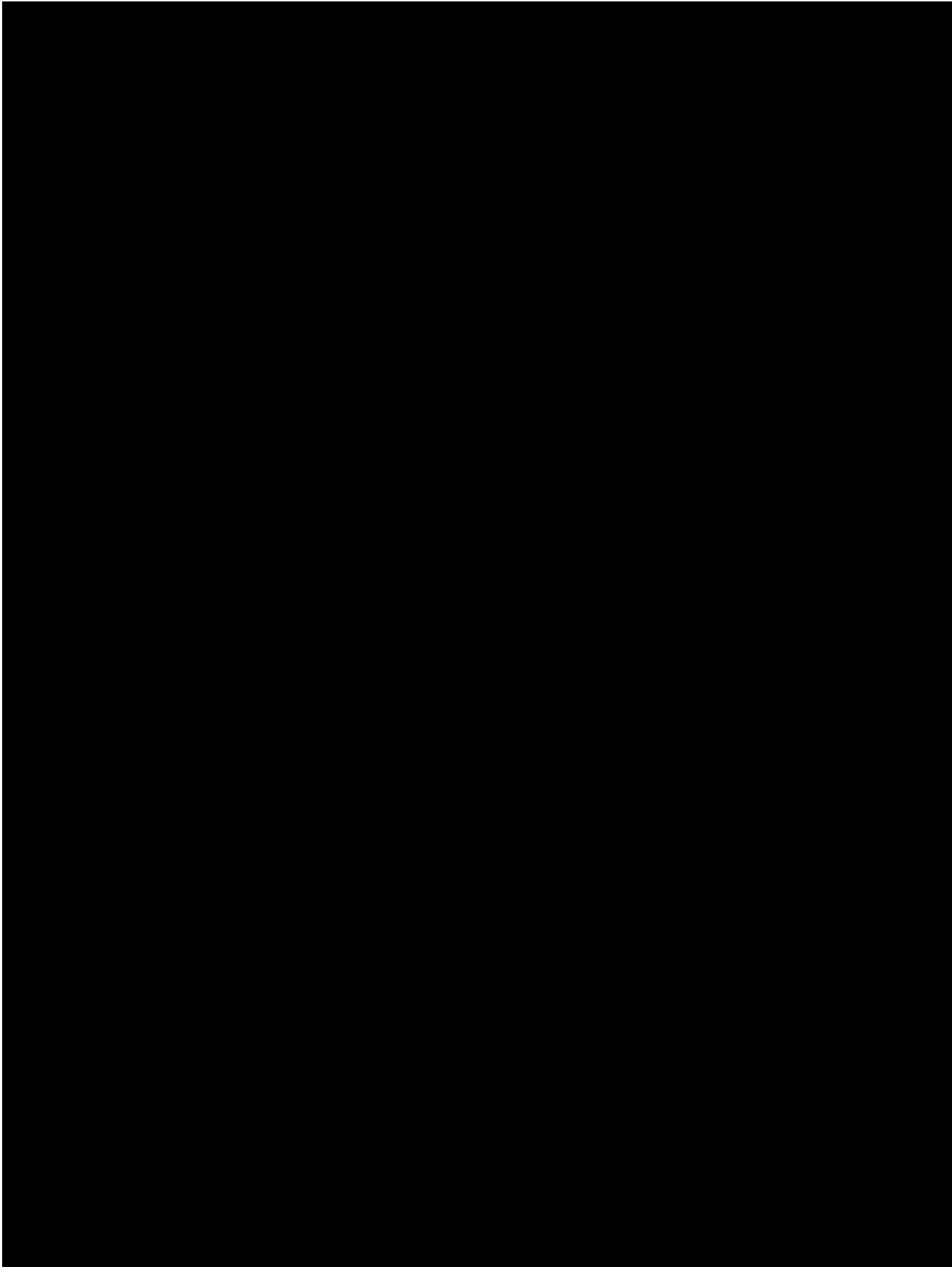
2022 OLY1 - entry to Medical/Pharmacy/Optometry

2023 OLY1 - entry to BMHS 2/Medical/Pharmacy/Optometry

2024 OLY1 - entry to BMHS 2/Pharmacy/Optometry

- The cost of the MD has not yet been examined. Consideration needs to be given to any incremental increase in teaching costs, transition time, staffing, additional capex investment

[scope]



Capacity

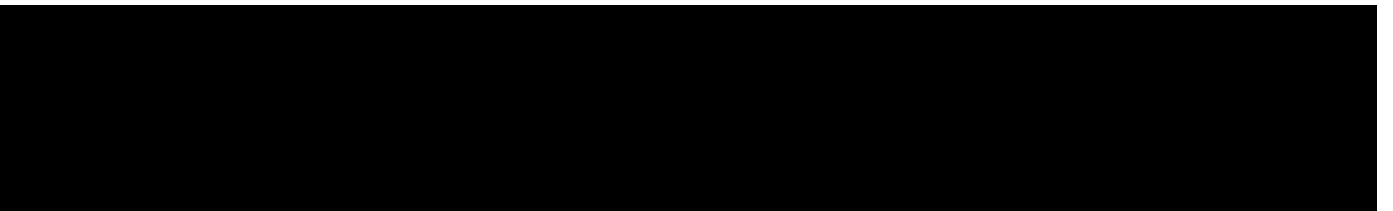
Further understanding of existing capacity of staffing and physical assets will be required for all programmes, and how the transition may impact on operational constraints. These factors include the need to balance being operationally achievable and financially acceptable, while delivering on required demand for quality graduates during the transition phase.

Other Transition Issues

Other transition matters that will require further consideration include:

- Cost of course development requirements is unknown at this stage however there will be a degree of building on current course material
- The transferability of content covered in OLY1 to BMedHSc
- Duplicated teaching costs during transition – details yet to be worked through
- Current CAPEX capacity and any additional CAPEX that may be required
- Response (or otherwise) by the University of Otago (medicine and pharmacy)

[scope]



[scope]



Appendix Three

Proposed Guiding Principles for Future Healthcare Professional Education

(Last updated 18 September 2021)

1. Education and training in all the Health disciplines remains fundamentally a science-based curriculum that espouses the principles of the scientific method and quantitative evidence-based evaluation and decision making. There is nevertheless a need to expand the curriculum to ensure future Health graduates have a wider appreciation of local and global factors that determine the health of society.
2. The UoA FMHS aims to be the leading health professional education provider in Aotearoa, graduating health professionals who are employable in a wide range of settings and able to pursue a wide variety of careers
3. Any change to education must enhance the participation and ultimately graduation of Māori and Pasifika people in health professional education. This means that any consideration of proposed change has an equity lens applied as a first principle. To avoid doubt, no change to the delivery of healthcare professional education should create further barriers for Māori and Pasifika people
4. All education provided by the FMHS must affirm, and actively prevent the erasure of, people with LGBTQI/Takatāpui+⁸² identities. Moreover, any changes to education must reflect that our faculty is committed to instilling in our graduates a robust knowledge of LGBTQI/Takatāpui+ identities and an understanding of health disparities and barriers affecting these communities
5. Learning and practicing cultural safety is the central to future health professional education
6. Future healthcare professional education needs to prepare students for the greatest health challenges they may face. These include but are not limited to:
 - a. Climate crises and the implications in the South Pacific
 - b. The ongoing effects on health of inequity, racism, and colonisation
 - c. Ageing population with more complex health and social needs
 - d. Changes in technology and how to leverage those changes to improve health
 - e. Rapid changes in knowledge (e.g., genetics, AI, data science) and how to manage new information into existing practice, that can be applied to individual patients
 - f. Managing complexity, uncertainty, and limited resources with the patient at the centre of care
 - g. Understanding determinants of chronic disease, and effectively tackling the prevention and management of such diseases

⁸² The LGBTQITakatāpui+ community includes people who identify as Takatāpui ('Intimate partner of the same sex'), lesbian, gay, bisexual, queer, intersex, transsexual, transgender, whakawahine, tangata ira tāne, māhū (Tahiti and Hawaii), vakasalewalewa (Fiji), palopa (Papua New Guinea), fa'afafine (Samoa, American Samoa and Tokelau), akava'ine (Cook Islands), fakaleiti or leiti (the Kingdom of Tonga), or fakafifine (Niue). <https://www.auckland.ac.nz/en/on-campus/student-support/personal-support/lgbt-students/support-lgbt-students.html> [Accessed 14 September 2021]

7. Learning and working in multi professional teams will be built into the future healthcare professional education. This means creating opportunities for future healthcare professional students to learn together in an environment that is mana enhancing for all students
8. Structures and systems will need to be in place to ensure that student wellbeing is ensured and well catered for
9. Pathways will be created to allow students to choose different learning opportunities e.g., research pathways, longitudinal rural placements
10. There will be early opportunities for students to be exposed to the clinical environment. The purpose of this early clinical exposure is to enable students to understand the broad range of careers available to them as future healthcare professionals
11. Selection strategies must actively consider ways of minimising competition, recognising that there will inevitably be some competition, unless a (weighted) ballot system is adopted
12. The FMHS has autonomy over the structure and content of health professional education and collaborates with faculties that deliver health professional education. This will enable flexibility, adaptability of teaching and learning
13. Where possible, interprofessional teaching and learning will occur to ensure effective and efficient use of resource across the faculty
14. Allow for students to exit degrees/programmes early with options to obtain a valuable qualification

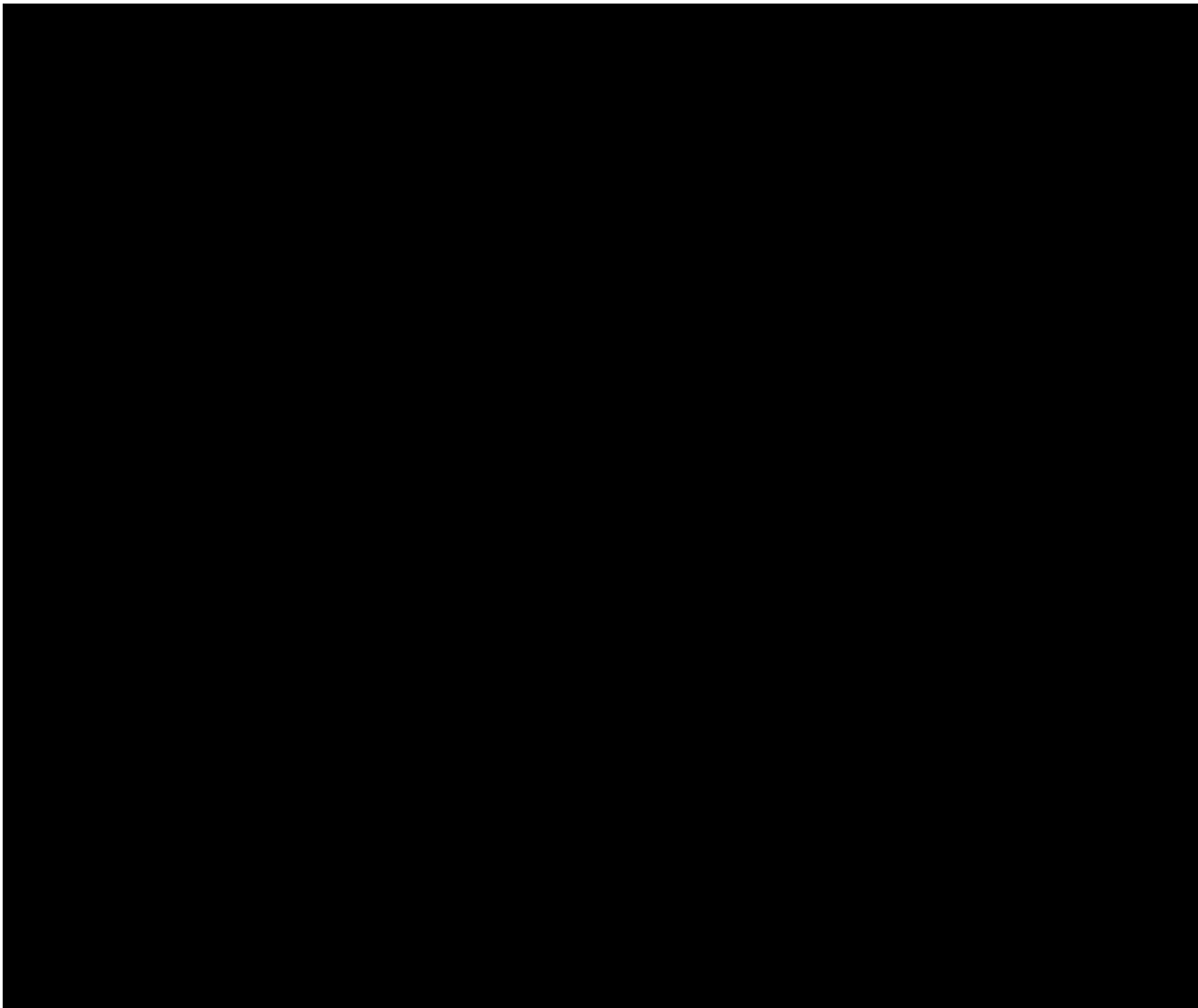
Appendix Four

Healthcare Programme Graduate Entry Pre-Requisites

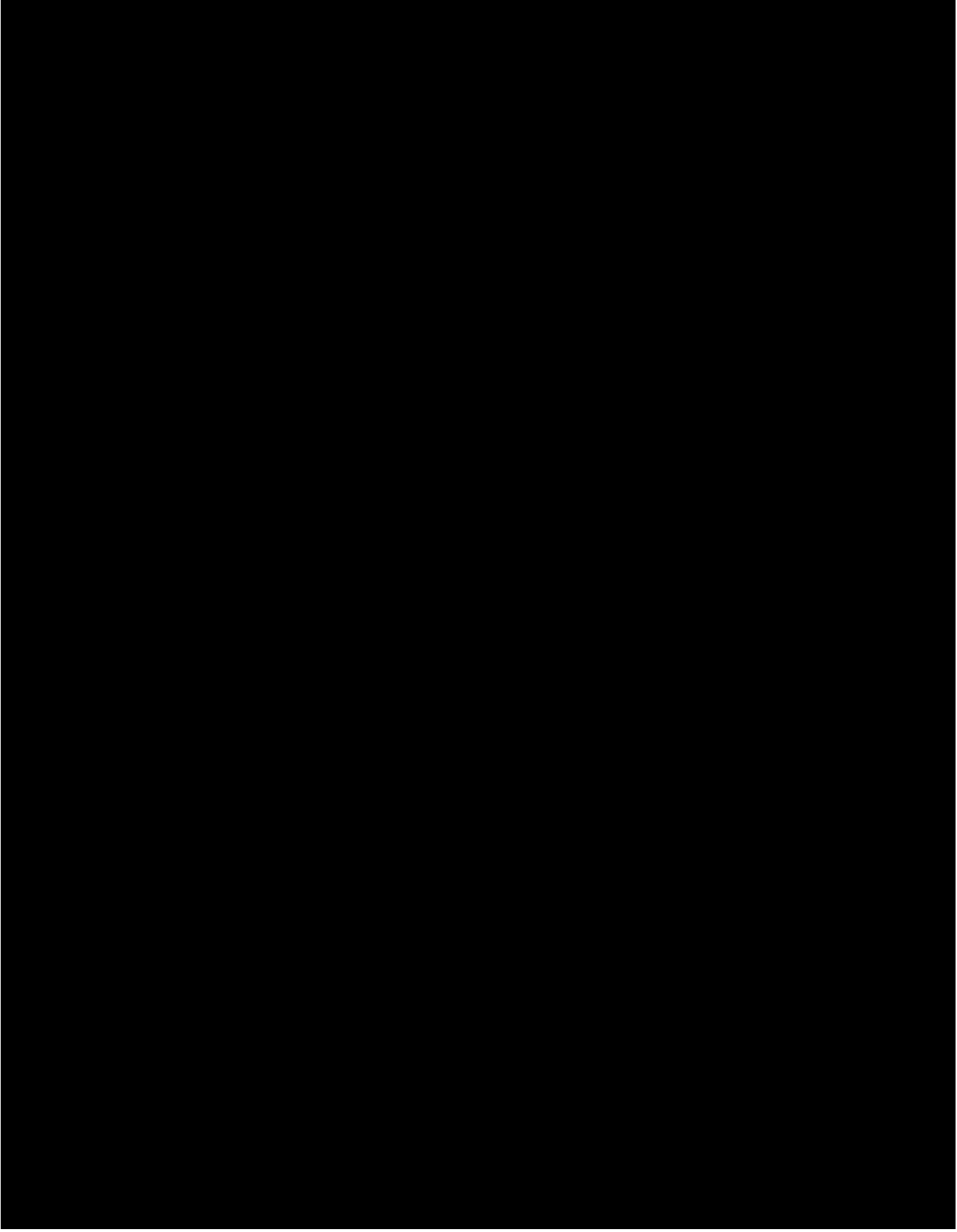
Table 7: G8 University Medicine Programme Pre-requisites

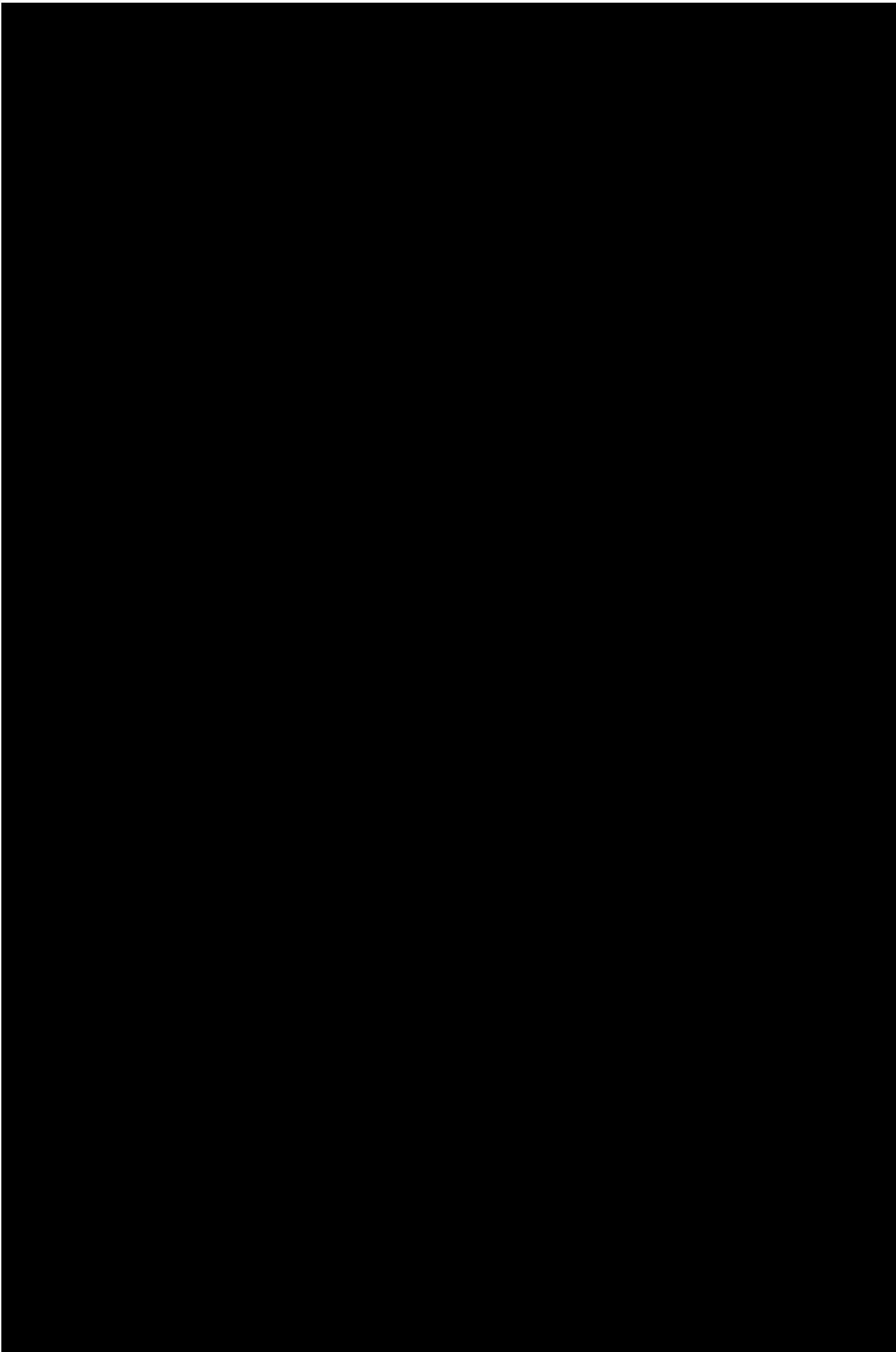
University & Qualification	Pre-Requisites	Other
University of Adelaide 3+3 Pathway B Medical Studies / Doctor Medicine	<ul style="list-style-type: none"> Entry to the Doctor of Medicine is based on completion of the Bachelor of Medical Studies at the University of Adelaide ATAR UCAT Interview 	
University of Queensland (UQ) 3+4 Pathway Doctor Medicine	<ul style="list-style-type: none"> Graduate entry: GPA 5 in a key degree within 10 years, GAMSAT and interview OR Provisional entry: Year 12 – ATAR, UCAT, interview. Must complete first degree at UQ within minimum specified time, GPA of 5 and pre-requisite subjects (cell and tissue biology and systems physiology) 	<ul style="list-style-type: none"> Course List Aus/NZ MD prerequisite table
Australian National University (ANU) 3+4 years Doctor of Medicine and Surgery (MChD)	<ul style="list-style-type: none"> Will accept 2-year accelerated bachelor's degree Degree within 10 years (but exceptions) No prerequisite degrees or subjects GPA 5.6, GAMSAT and an Interview 	<ul style="list-style-type: none"> Programme outline
Monash University 4/5 years BMedSci / Doctor Medicine	<ul style="list-style-type: none"> Offer both direct school leaver entry and postgraduate entry to their Bachelor Medical Science and Doctor of Medicine (MD) programme. Postgraduate entry students must have a specific Monash UG degree, as well as meeting other admission requirements Interview, SJT but no GAMSAT Undergraduate entry UCAT, ATAR, Interview 	<ul style="list-style-type: none"> Relevant UG degrees are: BBiomedSci, BPharm (Hons), BPhysio (Hons) or BSc 70% of places are reserved for students undertaking the BBiomedSci pathway
University of Western Australia (UWA) 3+4 years Doctor Medicine	<ul style="list-style-type: none"> Direct School entry (ATAR 99) and postgraduate entry Conditional offer after completing UWA bachelor's degree of their choice (may have specific subject requirements –Chemistry, Biology or Human biology, Maths, Physics) minimum GPA of 5.5 UCAT Interview invite based on UCAT 	<ul style="list-style-type: none"> Course Structure
University of Melbourne 3+4 years Doctor Medicine	<ul style="list-style-type: none"> UG degree in any discipline, studies completed within 10 years Prerequisite studies in anatomy, physiology and biochemistry consisting of at least one subject at second-year level of each, with prerequisite subjects to have been completed within 10 years GAMSAT MMI 	<ul style="list-style-type: none"> Each year is 38 weeks 30 bonded places for the dedicated rural pathway from 2022, including 15 UG entry from La Trobe University's BBiomedSci (Medical Degree) and 15 rural GEM places
University of New South Wales 8 years	<ul style="list-style-type: none"> ATAR UCAT Interview 	<ul style="list-style-type: none">

B Med / MD / Arts	<ul style="list-style-type: none"> • NO GRADUATE entry (except as below) • UNSW Medicine’s Lateral Entry Scheme is a graduate-entry stream into the BMed/MD, only for domestic UNSW Bachelor of Medical Science (BMedSci) students • BMedSci students apply second year of study. If application is successful, required to complete the BMedSci then undertake a Science Honours year before entry MD 	
<p>University of Sydney 3+4 Pathway Doctor Medicine</p>	<ul style="list-style-type: none"> • This double degree medicine pathway combines the MD with an undergraduate degree in arts or science. Arts students need to complete all requirements for the Bachelor of Arts, including the designated foundational knowledge units for medicine offered by the Faculty of Science within three years. • An online foundational knowledge course is available to all students on enrolment to ensure assumed knowledge in anatomy, physiology, molecular and cell biology is met • GAMSAT 	<ul style="list-style-type: none"> • 20% of Sydney's MD students come from non-biomedical science educational backgrounds



[scope]





Appendix Five

Working Group Membership

The working group membership below is in two parts. The top half of the table is the original group and below the shaded line indicate those who joined the group as the conversations evolved.

Name	Role	Faculty
Warwick Bagg (Chair)		FMHS
John Fraser	Dean (ex officio)	FMHS
Papaarangi Reid	Tumuaki (or nominee)	FMHS
Collin Tukuitonga	A/Dean Pacific (or nominee)	FMHS
Andy Wearn	Head of the Medical Programme (or nominee)	FMHS
Philippa Poole	Head of the School of Medicine	FMHS
Jeff Harrison/Shane Scahill	Head of the School of Pharmacy (or nominee)	FMHS
Julia Slark	Head of the School of Nursing (or nominee Lisa Stewart)	FMHS
Steven Dakin	Head of the School of Optometry & Vision Science (or nominee Andrew Collins)	FMHS
Paul Donaldson	Head of the School of Medical Sciences (or nominee Clare Wall)	FMHS
Robert Scragg	Head of the School of Population Health (or nominee Alistair Woodward)	FMHS
Roger Booth	Phase 1 Director	FMHS
Jenny Weller	Head of CMHSE (or nominee Karen Falloon)	FMHS
Hazel Wilks	Recent health professional graduates – School of Medicine (1 of 3)	
Robert Haua	Recent health professional graduates – School of Pharmacy (2 of 3)	
	Recent health professional graduates (3 of 3)	
Eva Ng	Business analyst	FMHS
Laura Wilkinson-Meyers	Associate Dean Academic	FMHS
John Egan	Associate Dean Learning & Teaching	FMHS
Lisa Stewart	BNurs Programme Director - School of Nursing	FMHS
Andrew Collins	Academic Director – School of Optometry and Vision Science	FMHS
Alistair Woodward	Professor Epidemiology and Biostatistics - School of Population Health	FMHS
Sue McGlashan	Anatomy and Medical Imaging - School of Medical Sciences	FMHS
Clare Wall	Academic Director - School of Medical Sciences	FMHS
Duncan McGillivray	Professor Chemical Sciences	SCIENCE
Maria Pontiki	FMHS HR Advisor	FMHS
Tom Hockey	VP Education AUMSA EXEC	FMHS
Sam Robertson	President AUMSA EXEC	FMHS
Jina Bae	Part IV BOptom Student and NZ Optometrist Students Society (NZOSS)	FMHS

Appendix Six

School of Biological Sciences Feedback on Draft Report

We thank FHMS for sharing their Future of Healthcare Professional Education draft working group report with us. Here is our feedback around some key questions that we see as important, specifically regarding the Biomedical Science Programmes.

Key Questions

1. Does one undergraduate program provide sufficient capacity to incorporate the depth and breadth required for both the Biomedical and Health Sciences?

In the proposed UG degree program there is justifiably considerable emphasis on the population health issues currently facing NZ and the world. We are concerned that there would not be sufficient capacity to incorporate the diverse field of Biomedical Science into this same program. Biomedical Science studies the biological processes that underpin human function, health, and disease, and the treatment of disease, and is hence a diverse multidisciplinary field. This is reflected by the nine discipline focused pathways in the recently restructured UoA BSc in Biomedical Science* and furthermore by the multiple discipline-based majors offered by other academic institutions in their Biomedical Science and Medical Science programs i.e. Universities of Sydney, Melbourne, New South Wales, Otago (NZ) & Oxford (UK).

To provide the depth and breadth required for these Biomedical Science pathways/majors the UoA together with the aforementioned academic institutions allocate a large proportion of these programs for the delivery of core or elective Biomedical Science courses. For example, UoA BSc Biomedical Science students take 6 stage II and 5 stage III Biomedical Science courses, the course combinations for which are prescribed for each pathway. Overall, the UoA BSc Biomedical Science includes 11 stage II and 26 stage III courses, further reflecting the diversity of this field.

To remain internationally competitive, we therefore need to continue to offer multiple discipline based Biomedical Science pathways/majors and dedicate enough of the program to these pathways/majors ensuring our students graduate with a qualification comparable to their international counterparts.

Another important point to highlight about the Biomedical/Medical Science programs provided by the Universities of Sydney, Melbourne, New South Wales, Otago (NZ) & Oxford (UK), is that they all include substantial amounts of cell & molecular biology, chemistry, biochemistry and genetics in their 1st year, some also extend this into years 2 to run in parallel & compliment major. This highlights the importance of providing students with a sound understanding of the basic biological and chemical process in the human body to support their transition into the more specialised pathways/majors in Biomedical Science. The current UoA BSc Biomedical Science also includes a large amount of this material at stage I to underpin the subsequent specialised studies in the pathways.

* Restructured UoA BSc Biomedical Science pathways

SMS (FMHS) BSc Biomed Sci designed pathways:

Anatomical Imaging Science
Cancer Biology and Therapeutics
Cardiovascular Biology
Infection & Immunity
Neuroscience
Nutrition & Metabolism
Reproduction and Development

SBS (FoS) BSc Biomed Sci designed pathways:

Cellular and Molecular Biomedicine
Genetics

NB: all the above pathways also include a Quantitative Biology course (BIOSCI 220)

2. Will there be a pathway to ensure that students graduating from UG Biomedical studies can seamlessly transition into PG Biomedical Science studies?

Many of the career paths that Biomedical Science leads to (e.g. medical researcher, clinical trial administrator/scientist, pharmaceutical scientist, science writer/communicator, policy advisor), also require students to have taken PG Biomedical Science programs (this trend is evident internationally); therefore students graduating from this program need to have sufficient background in Biomedical Science and basic laboratory skills to embark on PG Biomedical Science studies.

SMS (FMHS) has designed a very successful suite of PG Biomedical Science programs (PGDipBiomedSci, MBiomedSci and BBiomedSciHons), which many of our BSc Biomedical Science students transition into, furthermore some of our students go to Otago or overseas for their PG Biomed studies. We need to ensure that we adequately equip our UG Biomedical Science students so they can transition into these PG Biomedical Science programs. Given what has been discussed above, can a combined Health and Biomedical Science degree prepare students for PG Biomedical studies, as their Biomedical Science knowledge and skills may not be comparable with their NZ or international counterparts?

3. Does FMHS have the staff, resource and building capacity to run a combined Biomedical and Health Science Programme?

Table 13 below shows the increase in stage I enrolments in the BSc Biomedical Science program, and further shows retention in years 2 and 3 has also increased. Collectively these factors have led to elevated numbers in this program and financial benefits for the UoA. If we were to switch to a combined Health and Biomed program, would we be able to maintain this level of student capacity? If so, how would this work? For example, teaching distributed between FMHS and FoS to accommodate similar student numbers so the UoA doesn't suffer what could be substantial financial losses?

Alternatively, if Biomedical Science and Health Science continued to be delivered separately, but both incorporated some common courses over the 3 years that were deemed to be essential by FMHS professional programs, could both be feeder programs for PG entry into the professional programs?

Each program could then make changes in response to the curriculum transformation, address curriculum scaffolding issues caused by OLY1 and incorporate & scaffold in key courses deemed necessary for professional program entry. This would help retain student capacity (and maybe minimise financial losses) and the professional programs could recruit graduates from these two programs using the GPA and interview criteria detailed in the FMHS proposal.

N.B. if we change to entirely PG professional program entry, we will inevitably see changes in UG student numbers across stages I, II & III. But by ensuring capacity is available we would be better placed to deal with these changing student numbers and navigate our way through the transition period (when new and old programs are delivered simultaneously).

Table 12: Number of students enrolled in BSc Biomedical Science

	Acad Level	2021	2020	2019	2018	2017	2016	2015
Year I	0-119 pts	671	556	634	606	582	581	605
Year II	120-239 Points	229	164	155	175	158	145	164
Year III	240-359 Points	133	145	101	121	89	102	106
360+ Points	360+ Points	11	3					
Grand Total		1044	868	890	902	829	828	875

Note: Figures in grey calculated previously, using different parameters compared to 2020 and 2021

4. You describe a new graduate profile and education mega-trends but don't specifically comment on the pedagogies you will be using to teach into the new programme. What will these be?

This also relates to the capacity question, and if the programme will be EFTS driven or limited in places. There is a lot of information in the review on medical educational programmes, but not on the quality of teaching within them or the breadth of pedagogies used. How will you align Taumata Teitei's desire for student-centered, inclusive teaching into what may still be large classes with a competitive cohort in the UG programme? How are you planning on changing traditional didactic teaching pedagogies and assessment practice to be in line with the scholarship of teaching and learning research into best practices in higher education? How will you upskill your academic staff to be able to teach these new courses, specifically in the Mātauranga Māori space with so few Maori academic staff members? How will you manage these large-scale changes in teaching within current staff workloads?

5. We are pleased to see that adverse impacts on other Faculties has been included in your Threats Analysis

We would like to continue working in good faith with FHMS in order to provide the best education possible for students that span our faculties, and ask to be included in working groups where possible. There is considerable expertise in the School of Biological Sciences in the areas of computational biology, microbiology, microbial ecology, conservation and climate change. All areas of importance in population health and the future medical workforce described in your review document. We can contribute with research-led teaching into these transdisciplinary curriculum areas and would like to be involved with curriculum building in these areas.