ACADEMIC: ESSAY

Should New Zealand medical schools use a lottery system to select their students?

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Admissions; Selection; Lottery; Applicants; Medical Schools

Introduction

Over the years, entry into New Zealand medical programmes has become increasingly difficult and controversial. Many worthy candidates are rejected from medical school despite having a strong academic background and excellent non-academic attributes.[1,2] Medical schools' obsession over choosing the most "outstanding" applicants has created great concern over the fairness and predictive ability of current medical school selection procedures, with some scholars proposing the use of a lottery admission system to select future medical students.[3] This paper examines the issues related to the current selection system and evaluates the potential feasibility for a lottery to become a more neutral, inclusive, and fairer admission system.

The overarching goal of any healthcare system is to ensure everyone can adequately receive and access the healthcare services they need. Over the next two decades, New Zealand's population is anticipated to become even more ethnically diverse, with varying rates of growth, mortality, and migration between ethnic groups.[4] In order for New Zealand's public health system to successfully tackle the issue of providing high-quality healthcare services to a diverse population, we must carefully consider how our future doctors are chosen.

The author believes that an ideal medical selection policy should satisfy the following criteria. The application process must be fair to society by ensuring that selected students have the potential to become competent doctors and also be fair to applicants, providing transparent and rational reasoning for choosing certain students among similarly qualified candidates while offering equal chance at selection to all applicants who have the potential to succeed in medical school. The process should also be cost-effective for medical schools. Additionally, the outcome of such a selection policy should be able to produce a diverse medical workforce capable of meeting the needs of a diverse patient population. A lottery admission system certainly possesses the potential to fulfil this vision.

This paper begins with an introduction to the selection tools currently used by New Zealand medical schools before examining the issues and appropriateness of current selection methods based on reliability and validity. The author will then discuss the advantages and disadvantages of the use of a lottery admission system on both a process and outcome level by considering the themes of student diversity, psychological impact on rejected applicants, applicants' capacity to strategically influence their selection outcomes, the ability to create a health workforce that meets Aotearoa New Zealand needs, transparency, opportunity cost and effect on societal equality and educational value.

Selection into New Zealand medical schools

The New Zealand medical degree (MBChB) is a six-year undergraduate programme and is offered by two universities, the University of Auckland and the University of Otago. There are two pathways for entry into New Zealand medical schools: Entry after completing a one-year competitive preparatory course or entry following the completion of a degree from a recognised university. Undergraduate applicants or graduates who come from a non-science background must complete the first year courses in foundational biomedical and health sciences at the same university where they plan to enrol for medicine. Upon gaining entry into medicine, the first year courses are credited to the six-year medical degree.

Selection into New Zealand medical schools is often a difficult and controversial process in which many applicants with seemingly identical attributes and qualifications compete for a few places. Thus, to select the best students, medical schools use a variety of cognitive and non-cognitive criteria. Currently, medical schools in New Zealand evaluate applicants based on three broad criteria. Firstly, academic scores obtained from their one-year preparatory course for undergraduate applicants or degree for graduates. Secondly, scores obtained in the University Clinical Aptitude Test (UCAT). Finally, some applicants are also evaluated on their social attributes, such as empathy and communication skills, through multiple mini interviews (MMIs). There is great variability in the number of selection criteria used and how they are utilised between medical schools; the University of Auckland generally utilises all three criteria for its domestic applicants (Figure 1 and 2), while the University of Otago uses two of the three criteria to evaluate a domestic applicant's suitability to study medicine (Figure 3 and 4).

Issues with current selection procedures

The key focus of current selection tools is to select students who are likely to succeed in their desired medical programme and beyond. Thus, admission into New Zealand medical schools heavily depends on an applicant's academic performance. Academic grades are the strongest predictor of academic success in the first few years of medical school and the timely completion of the medical degree.[5] Research suggests that good academic performance in medical school is also associated with higher clinical competency for junior doctors in their first postgraduate year.[6] However, relying on grades as the primary criteria for entry creates a fairness issue within the selection process as it inadvertently perpetuates educational inequities. It favours those with prior educational backgrounds and those with family members working in the medical profession. It also overlooks social equity, suitability for the medical profession, and the necessity for a diverse medical workforce.[7]

The University Clinical Aptitude Test (UCAT), which replaced the Undergraduate Medicine Admission Test (UMAT) known until 2019 as

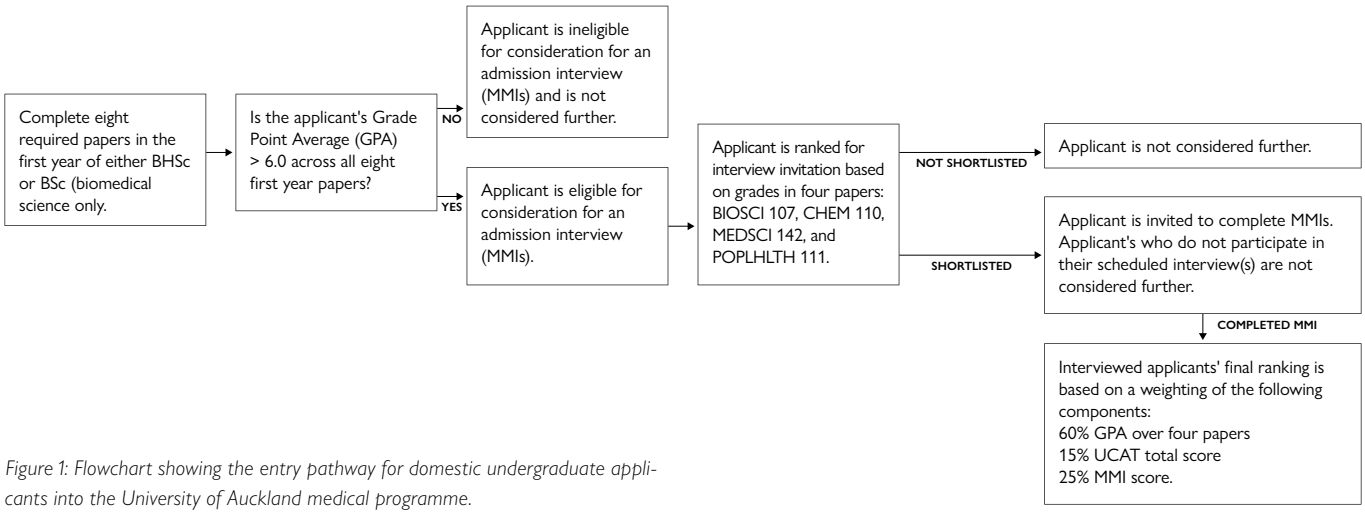

Figure 1: Flowchart showing the entry pathway for domestic undergraduate applicants into the University of Auckland medical programme.

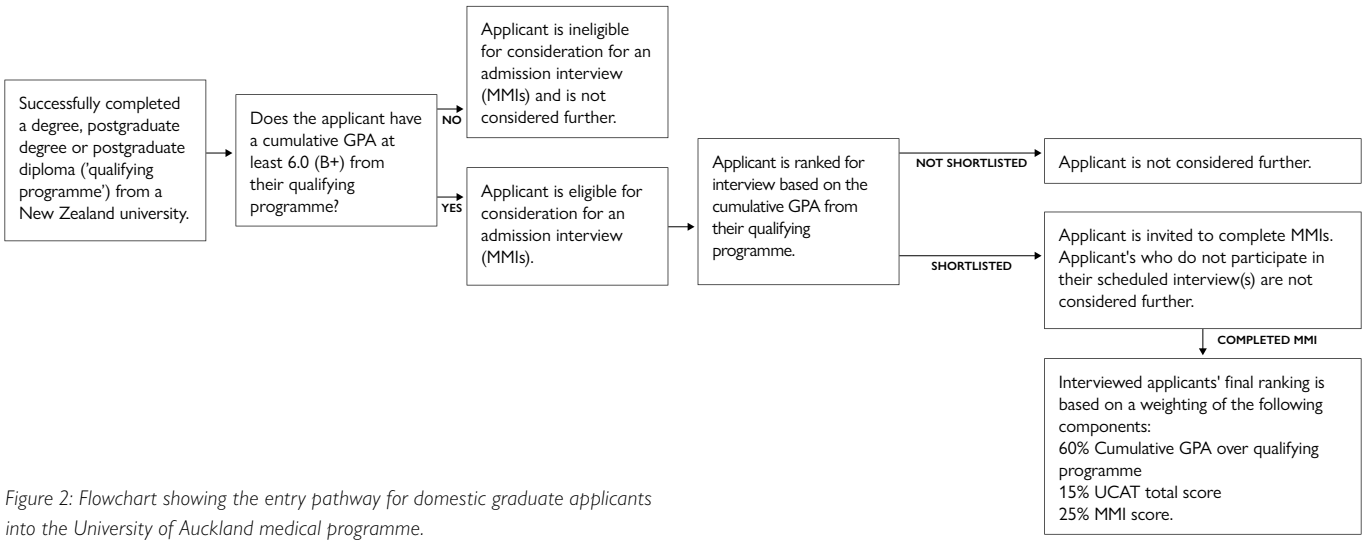

Figure 2: Flowchart showing the entry pathway for domestic graduate applicants into the University of Auckland medical programme.

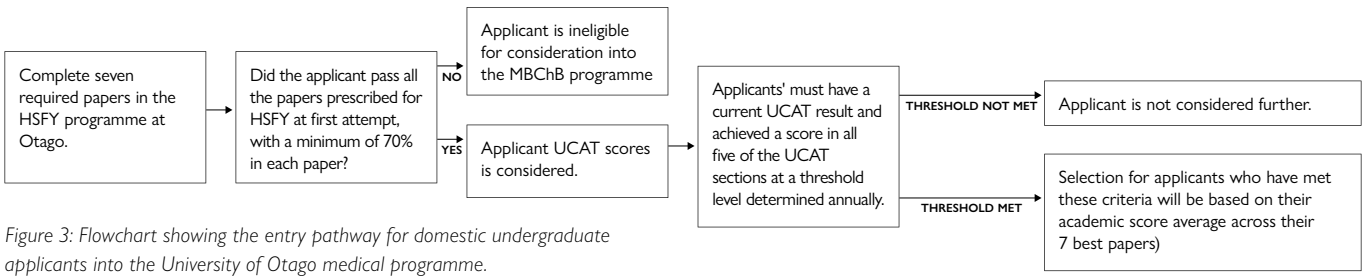

Figure 3: Flowchart showing the entry pathway for domestic undergraduate applicants into the University of Otago medical programme.

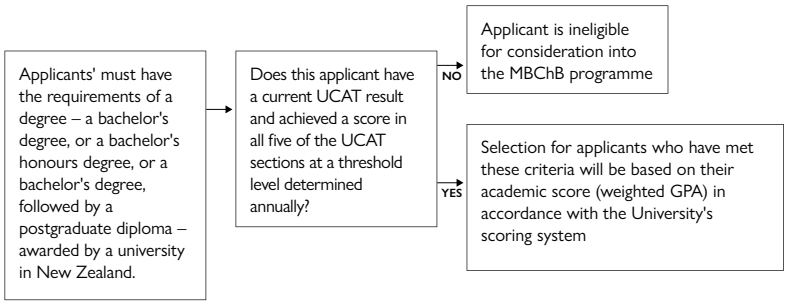

Figure 4: Flowchart showing the entry pathway for domestic undergraduate applicants into the University of Otago medical programme.

the UKCAT, is a compulsory requirement for domestic undergraduate and graduate applicants. It is a computer-based aptitude test designed to examine the test-takers' inherent intellectual ability, attitudes and professional behaviours necessary for success in their clinical careers as new doctors and dentists. The UCAT requires no prior scientific knowledge as it evaluates logical problem-solving and non-verbal reasoning skills. Several studies in the United Kingdom have shown that the UCAT does not correlate with medical school performance.[8,9] Conversely, Tiffin et al. showed that there is some modest evidence in the predictive power of UCAT scores with future performance in medical school.[10] So why do medical schools continue to utilise the UCAT as part of their admission process if the UCAT only adds a small amount of incremental validity over other measures of academic attainment? The answer is unknown. Perhaps it is because the UCAT has been shown to increase the proportion of students from under-represented socioeconomic groups who are admitted to medical school.[11] However, it is unclear whether this means that the UCAT is selecting the most suitable candidates from under-represented socioeconomic groups. It is also uncertain whether any of the questions asked in the UCAT contain inherent biases that may disproportionately impact certain cultural or demographic groups.

Finally, to ensure selected candidates have the most favourable traits for medicine, such as empathy, ethical awareness and logical reasoning, the University of Auckland and some overseas medical schools use Multiple Mini Interviews (MMIs). MMIs are a non-biased, reliable and practical non-cognitive admission tool.[12] The MMIs consist of a series of time-limited, independent short interview stations, each testing for specific attributes desirable in medical professionals. The focus of MMI questions is not on medical knowledge but on examining an individual's underlying emotional intelligence, personal values, and worldview. The most significant advantage of using MMIs is that it allows for the assessment of numerous attributes across several independent interviewers, leading to higher validity and reliability. A study done by the University of Dundee School of Medicine found that MMIs were a significant indicator of early medical school success.[13] However, this finding should be replicated in New Zealand medical schools for a more applicable analysis. There should also be an investigation on MMI scores and their correlation with postgraduate training performance. One drawback is the significant investment of time and resources needed to develop the MMI process. Furthermore, it is unclear whether it is appropriate to attempt to predict a candidate's future competency as a physician early on in their life. If the attributes assessed by MMIs can be changed over time based on an individual's life experiences and environment, then preselection is futile.

Evaluating the efficacy of these various medical student selection tools is challenging as low-scoring candidates do not gain admission and thus are excluded from further analysis. Nonetheless, there is still no consensus on who should be selected as future doctors or a universally agreed-upon definition of a "good doctor". Thus, current selection procedures are defining preadmission characteristics in the absence of robust evidence.

Rationales for a lottery system

Many people find the idea of using a lottery system to select medical students to be absurd. One could argue that a lottery system undermines hard work, talent, and effort and arbitrarily restricts freedom of career choice.[14] However, the Netherlands have used a lottery system to select medical students for over 40 years.[14] Starting in 1972, the Dutch government implemented a national lottery system for admission to all Dutch medical schools; initially, the system selected applicants at random but in subsequent years, a weighted lottery system was introduced for medical school admissions.[14]

One of the key arguments for supporting a lottery admission system is that it counters the disadvantages of a qualitative selection criteria. Specifically, both in terms of process and outcomes, a lottery admission tool would be an effective non-discriminatory selection tool that helps reduce reduces persistent admissions disparities and biases.[15] Selection procedures that assess medical school applicants on scores, such as scores in psychometric assessments and academic grades, will inherently favour certain groups. Commercial training companies offer costly and exclusive preparatory training sessions to exploit applicants' fears that they won't be able to fulfil their lifelong dream of studying medicine. Despite recommendations against relying on external preparatory materials, many candidates still do, perhaps with good reason. Candidates who are exposed to UCAT coaching material may have increased familiarity with the test format and its question types, allowing them to improve their test-taking techniques and question recognition skills, which may ultimately lead to a higher UCAT score.[16] Therefore, there is the potential for candidates from affluent families to be better prepared for such tests, which further marginalises financially disadvantaged and underrepresented groups. In addition, the current emphasis on marginal differences between applicants' academic and aptitude test scores is often insignificant in determining suitability for the medical programme.[14] The academic performance of students selected into medical school by selection criteria performed slightly better than those who entered through a lottery system. However, the results are generally inconclusive.[14,17] No differences in performance between these groups of students were noted after medical school.[14]

Another important aspect to consider is the negative psychological impact of being rejected. The objective is to establish a selection process that avoids making applicants feel like they have failed and recognises the importance of individuals appreciating their own worth to achieve success in different domains of life, even if that was not their first choice. Rejection from medical school on impersonal grounds, such as through a lottery system, is less likely to impact an applicant's self-esteem than a rejection based on personal grounds, such as through a selection method that assesses personal attributes.[18] While rejection from any selection system can evoke feelings of shame and unworthiness, a random selection procedure offers some emotional comfort to all applicants, especially to high performers—applicants know that they did everything they could to qualify for consideration. There is also the possibility that some successful applicants may feel undeserving, while unsuccessful applicants may perceive the system as unfair.

An ideal selection tool should remain neutral and ensure that applicants do not have the opportunity to exert influence on their medical school chances. However, this is not the case with current selection processes. Since both medical schools openly disclose their scoring methods, it incites applicants to "game" the admission system by adopting behaviours that maximise their chances of being successful in the selection process. For example, applicants who perceive their main strengths to lie in academic studies might be more inclined to choose Otago over Auckland, as there is no interview and once they have passed the UCAT threshold, the deciding factor will be their academic grades. Such strategic behaviour presents an opportunity for applicants to exert influence on their chances of gaining admission to medical school. Conversely, a lottery admission system would ensure equal opportunities for all qualified applicants.

Aotearoa New Zealand requires a medical workforce that can meet its needs. A lottery can create a workforce that meets the healthcare needs of the New Zealand population, ultimately resulting in a more responsive and inclusive healthcare system. As our society becomes more diverse and older, there is a greater need for doctors in primary care. However, many medical students strive to work in specialty care rather than being a generalist after graduation.[19] An Australian study found that medical students often did not see general practice as a specialty or as intellectually challenging.[20] They are drawn to specialty care due to factors like earning potential and employment security. Discipline-specific interests and challenges also heavily influence a specialty career choice.[21] Students who are selected into medical school through a qualitative criteria are perceived as being top achievers due to the competitive admission process, leading to a preference for specialty careers as they are perceived to be more prestigious, intellectually stimulating, and better aligned with their leadership desires.

A lottery system can address Aotearoa's workforce challenges and promote gender and ethnic diversity.[13] This is because such an admission system would remove any misconceptions regarding the medical school admission process, such as the requirement of being academically talented to succeed in medical school or the necessity of having a "type-A" personality. Removing such misconceptions encourages all members of society to participate in the medical school admission process and take responsibility for the health of their communities. Creating a diversified and inclusive medical workforce ensures that the future medical workforce can deliver optimal and high-quality healthcare to patients with diverse backgrounds.[22]

Limitations of a lottery system

A lottery system may not necessarily promote diversity and access to medical education. The objective is not to have a pure lottery, but rather a lottery that is open to all applicants who have demonstrated potential to succeed in medical school. However, setting eligibility thresholds is challenging as they will have to rely on academic grades, non-cognitive test scores, or a combination of both, in order to ensure admitted students have met a certain standard of academic preparation. Such academic and non-cognitive test thresholds could systematically discriminate against Indigenous and low-income applicants. An American study of a simulated lottery-based system with realistic academic thresholds for college admissions only resulted in a very small acceptance rate for minorities, thus, is unlikely to produce the same racial proportionality as present-day affirmative action schemes.[23] A solution to this issue is to conduct separate lotteries for each under-represented racial and socio-economic group. Affirmative action policies have been pivotal in providing equitable access to students from under-represented groups, including Māori and Pacific students, but more work still needs to be done as they are still significantly under-represented in the medical workforce compared to the general population.[24] This means that if New Zealand was to adopt a lottery admission system then there would be separate lottery pools for minority and under-represented applicants. Yet some may argue that introducing too many variables into a lottery selection system may undermine the very spirit of the system as it reintroduces "favouritism" despite the positive intentions behind such a policy.

A lottery admission system also fails to acknowledge the opportunity cost associated with applying to medical school. It inadvertently creates a system where, once applicants have met the eligibility threshold, the ultimate determining factor for acceptance becomes the number of times applicants apply. This approach disproportionately affects applicants from lower socio-economic backgrounds due to the financial burden and opportunity cost associated with multiple applications. Applicants from higher socioeconomic backgrounds can afford to persistently apply year after year, increasing their chances of eventual acceptance, while applicants with financial constraints face significant barriers in pursuing such a strategy. However, the premise of this strategy relies on the presumption of infinite medical school applications, which, in reality, is not possible in most medical schools, particularly in Aotearoa, where such opportunities are currently limited.

The adoption of a lottery system could discourage hard work and ignore talent. Admission into medical school would be no longer based on merit but on luck. A lottery system could be unfair to candidates who are more accomplished and hardworking than others—an applicant who worked extremely hard on their medical school application and test scores would have the same chance as someone who applied as an afterthought. Our society values and encourages individual achievement and success; thus, changing to a lottery system could undercut the value of education. The issue is that once medical schools define the selection criteria for admission into the lottery system, candidates will aim for the bare minimum, as there is no incentive to do better. This may have wider ramifications, including diminished academic performance, reduced educational effectiveness and motivation among students.

Conclusion

Medical schools must carefully consider the implications of using a lottery system for medical admission purposes. Both the lottery and existing selection processes have their benefits and drawbacks for each set of stakeholders. While having an admission system that pleases everyone is impossible, public scrutiny over current admissions practices highlights the necessity to explore potential changes. A lottery system for qualified and academically equal candidates, could make medical schools become more inclusive, increase transparency and fairness, and improve the ability for the future workforce to deliver equitable care to all. Should medical schools invest substantial resources seeking to define and qualify what it takes to be a successful doctor and select those who fit a bespoke criteria? Or should they adopt a lottery-based selection system?

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