

Accepting randomness in medical school admissions: The case for a lottery

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Abstract

McMaster University's medical school, faced with the need to socially distance during the COVID-19 pandemic, recently replaced their structured admission interview process with a partial lottery. At first, it may seem that leaving medical school admissions partly to chance could erode autonomy and meritocracy. Yet our current system for selecting medical students is strained by a limited predictive ability. In the search for good doctors, we lack meaningful, quantifiable, and comparable criteria. Partial or weighted admissions lotteries can offer us an escape. They have the potential to reduce mental and financial burdens on both applicants and medical schools, avoiding an overemphasis on marginal differences between applicants. Lotteries are also a simple way to address persistent admissions disparities by being truly non-discriminatory. At the very least, lotteries represent a useful benchmark against which we can rigorously compare current and future selection methods.

McMaster University's medical school (Ontario, Canada), faced with the need to socially distance during the COVID-19 pandemic, replaced their structured admission interview process with a partial lottery granting chance acceptance to a selection of pre-screened students (Hristova 2020). This unconventional approach led me to reflect on two questions about how we choose doctors: (1) Does the application process for medical school select for talent or merely purport to select for it? and (2) Is the outcome within an individual's control or already the product of implicit chance? After considering these questions, the case for a lottery became stronger.

McMaster isn't the first school to try a lottery. From the 1970's until around 2016, at least a portion of medical students in the Netherlands were selected by a weighted lottery (Boyle 2010; Stegers-Jager 2018). An applicant's chances were adjusted based on their prior grades. While the lottery did not last, the experience proves a fundamental premise: admissions officers need not fear disaster. Even during a period when all students were selected via lottery, graduation rates were about 85% (Stegers-Jager 2018). Randomly selecting students who meet basic educational requirements seems to ensure reasonably successful candidates. The question then becomes whether our active selection processes offer an incremental improvement.

To evaluate how well the medical school admissions process selects for the best doctors, we must first define a "good doctor." Experts politely call this the *criterion problem* (Patterson et al. 2018). Even as a practicing physician, I don't have an easy solution to this problem, one that can encompass the myriad attributes we expect from our physicians. (One study tallied up a list of 87 desirable attributes (Stegers-Jager 2018).) I think medical schools can be just as confused. Applicants are evaluated along a number of

scholarly and personal dimensions, both standardized and non-standardized. Many of the qualities we seek – academic achievement, devotion to others, communicative ability – do not always seem to be related to each other. How evaluation, then, culminates into a final decision offers little consistency across schools and nations. More challenging, many of the qualities we desire in medical school applicants are not easily quantifiable and comparable – how do we rank students by degree of compassion or curiosity? While structured instruments have been devised, quantifying human virtue will always be reductive. Being able to directly compare applicants would seem a pre-requisite if we are to accurately select not only candidates who will make good doctors, but will make better doctors than those denied admission.

Medical schools today are selecting tomorrow's late career physicians. Fundamentally, I wonder if the skill of a practicing physician is predetermined in one's youth. Medical education is a protracted process. I was admitted to medical school at age twenty. Starting practice now at age thirty-two, this turn of events feels presumptuous. Was there some immutable part of me at that tender age, seen by a wise admissions officer, which destined me to become a pathologist? (I entered medical school hoping to be a primary care physician.) If the qualities of a good doctor are not innate or fixed, then pre-selection is futile. The experts of the Ottawa consensus group agree, writing that "selecting out for specific traits might be of limited validity given the dynamic nature of traits and the context specificity of trait expression" (Patterson et al. 2018). Put more simply, humans are capable of changing based on their experiences and environment.

I have been told that the application process isn't meant to select the best doctors; rather, its defined and arbitrary nature allows selection of the most motivated, hard-

working students willing to overcome these hurdles. Emphasizing such qualities is not irrational, as medical training requires years of hard work. The Dutch experience suggests that an active admissions process may improve self-selection of the most motivated students (Stegers-Jager 2018). One could imagine more straightforward measures of industriousness, however, if this is the primary quality desired. Should completion of a 1,000 piece jigsaw puzzle be a pre-requisite for entering medical school?

Most educational traditions are just that: traditions – folk methods passed on from generation to generation. Many traditions were developed with noble, meritocratic intentions; others were rooted in bias. Either way, it is very rare for a selection process to have been adopted only after study through randomized controlled trials – modern medicine’s gold standard for evidence. If we decide to pursue greater formal evaluation of the processes that underpin medical school admissions, a lottery offers a fair control arm. The Dutch admissions system, for example, allowed schools to choose their own selection criteria, but students rejected from these procedures still had a chance in the lottery (Stegers-Jager 2018). This natural experiment offered unique insights into medical student selection, examining how various intentional selection criteria matched up against a lottery for outcomes like graduation rates and clerkship grades.

One barrier to accepting randomness will be psychological. The career path we choose to pursue has lifelong personal ramifications. It can be upsetting to believe an external or arbitrary force controls decisions of such consequence. Others, perhaps, may find comfort in the burden being lifted from one’s own shoulders. McMaster believes that the students being placed in the lottery are “all roughly equally qualified” (Hristova 2020),

but recognizes the lottery may cause distress to students who felt the interview gave them some autonomy over a high-stakes event.

Beyond real or perceived autonomy, we are compelled to improve fairness in medical school admissions. Some applicants are systematically disadvantaged by the metrics we utilize. Socio-economic factors are well known to influence who pursues and achieves a career in medicine (Youngclaus and Roskovensky 2018). It has been challenging for even conscientious admissions offices to eliminate these inequities. In fact, random selection is the overlooked gold standard of non-discrimination.

We must also consider the opportunity costs of our admissions process: the accumulated money and effort spent by all parties – admitted and not admitted – when a more efficient alternative might be available. Since the majority of medical school applicants in the United States do not gain admission (AAMC 2019), their collective effort represents a substantial human resource. Apart from time and energy, the direct costs of applying to medical school in the United States are typically in the range of thousands of dollars (Millo et al. 2019). A lottery may reduce resources spent on ultimately futile attempts to maximize admission chances.

The lottery process does not need to be absolute. McMaster University is winnowing their applicant pool using established metrics and offering admission to the top performers. The lottery is only incorporated where they feel an accurate discernment of quality is limited. A lottery can act as a safety valve, granting schools permission not to over-emphasize minute differences in test scores or extra-curricular activities.

As a doctor completing his medical training, I can identify elements in my own admissions process that were subject to chance. I acknowledge the lucky breaks and

unexpected turns. I doubt that many of the impressive curriculum vitae lines I worked hard to achieve truly improve my practice today. I recall admitted classmates who struggled in school and ultimately pursued a different career. I have smart, caring friends who were inexplicably denied an admission offer. Most importantly, I am grateful to the many mentors and colleagues who have shaped my career since admission. It is natural for us to frame our success as a rags-to-riches story, hard work triumphing over obstacles. While there is truth to this in anyone's life, it is just as true that we are defined by the obstacles never put in front of us – out of privilege or luck.

A lottery offers the admissions process many advantages. It is simple, affordable, and transparent. If a partial lottery replaces the need to distinguish between applicants' least meaningful and reproducible qualities, both parties will waste less effort pursuing real or imagined marginal gains. Systematic inequities associated with race, gender, or socio-economic status may be attenuated. A lottery is also humble. It recognizes the limits of our predictive knowledge. A lottery is welcoming, delivering a real and symbolic message that people of any background have a chance to become a doctor. At the very least, it represents a reasonable control arm for the rigorous study of selection processes. The gyre of life's events can be unpredictable. We often find this reality painful, but lotteries offer us an opportunity to instead harness randomness to our benefit.

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